

Emerging Trends in Information and Knowledge Management

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Editors:

Tom Kwanya, Joseph Kiplang'at and Justus Wamukoya

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In this regard we, therefore, acknowledge and appreciate the support of the top leadership of the two universities. We are particularly grateful to Prof. Dr.-Ing. F.W.O. Aduol, Vice Chancellor, The Technical University of Kenya for officially opening the conference as well as Prof. Paul Shiundu, Deputy Vice Chancellor in charge of Academics, Research and Students, The Technical University of Kenya for gracing the opening ceremony.

We also acknowledge the support given by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) Regional Office for Eastern Africa and Kenya Commercial Bank (KCB) by providing financial support for the conference. We particularly appreciate Mr Jaco Du Toit, UNESCO's Regional Adviser for Communication and Information for attending and making presentations at the conference. This support enabled the participants to focus more on the scholarly discussions rather than logistics. It definitely contributed to the quality of this academic product.

We also wish to appreciate the participants who contributed intellectually to the conference. First and foremost we acknowledge the keynote speaker, Prof. Adeline Du Toit for insightful speeches which set the pace for the conference. We also thank the session chairs as well as the presenters of different papers whose contributions form the chapters of this book. Without them, this book would not have been published.

We also wish to acknowledge the conference planning committee under the leadership of Prof. Joseph Kiplang'at, Deputy Vice Chancellor in charge of Administration, Planning and Infrastructure, The Technical University of Kenya; Prof. Justus Wamukoya, Dean, School of Information Sciences, Moi University; and Prof. Peter Maina Matu, Director School of Information and Communication Studies, The Technical University of Kenya. We also acknowledge the secretariat, editors, peer-reviewers, designers and printers who made this publication a reality.

Last, but not least, we appreciate Moi University Press for their technical input in preparing and publishing this book.

EDITORS

Preface

Information and knowledge have become the key pillars of national, organisational and individual performance, excellence, competitiveness, growth, innovation and impact. While information management is concerned with the lifecycle of information, knowledge management encompasses the processes, people, techniques and tools used to enhance the intellectual capital owned by individuals, groups and organisations in terms of their know-how, ideas, expertise, competencies and experiences. Essentially, knowledge management enables entities to make the best use of their knowledge assets. The value of knowledge to sustainable development is anchored on the fact that it is limitless; grows with use; and is not easily replicable.

In spite of the fact that information and knowledge are core components of the socioeconomic structures of the modern society, many challenges still hamper their effective management, diffusion, utilisation and perpetuation. Various discourses are ongoing on how best to manage these critical resources in ways which enhance their application in the human efforts to increase economic productivity, social justice, safety and general wellbeing of people worldwide. Consequently, theories have been developed; best practices established; and lessons learnt. However, challenges still abound on how best to share, apply and validate these nuggets.

This book is an integral part of this discourse through its 40 chapters authored by academics, professionals and practitioners in information and knowledge management. The chapters are structured around ten themes: Emerging Trends in Libraries and Information Centres; Knowledge Sharing and Diffusion; Indigenous Knowledge; Records Management; E-Governance; Information and Knowledge Management Education; Role and Impact of Information and Knowledge Centres Legal and Ethical Issues in Information and Knowledge Management; Social Media in Information and Knowledge Management; Digital Trends in Information and Knowledge Management

The uniqueness of this book lies in the fact that the authors of the chapters are drawn from diverse backgrounds, experiences and geographical contexts. This has enriched the content by creating diverse voices on the current and emerging issues in information and knowledge management. This approach ensures that the readers do not end up in restrictive echo chambers where they only access content which they are already familiar with. Similarly, it gives the readers an opportunity to readily find content on all the specialisation areas of information and knowledge management in one volume.

The chapters were subjected to a rigorous scholarly publishing process to ensure that they contribute fresh and unique perspectives to the themes. In this regard, they were subjected to a plagiarism test using Turnitin software; double blind peer review by eminent scholars in the discipline; and a comprehensive copy editing. Therefore, we are convinced that they will make significant contributions to theory, practice and policy in information and knowledge management. We wish you an insightful reading.

PROF. TOM KWANYA

PROF. JOSEPH KIPLANG'AT

PROF. JUSTUS WAMUKOYA

NAIROBI, KENYA

SEPTEMBER 2017

Foreword

We live on the verge of a new economic order anchored on the quality, quantity, access, use and perpetuation of knowledge and generally referred to as the knowledge economy. It is characterised by a greater reliance on intellectual capabilities than on the traditional factors of production such as land, labour and capital. The knowledge economy represents a transformation which shifts the economic focus from human labour and mechanisation to production and use of knowledge through knowledge-intensive activities. This increasing value of knowledge in economic production lends credence to the sentiments that, everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted.

Although there is no consensus about the proportion of economic development that knowledge contributes compared to the traditional factors of production, there is a general understanding that knowledge is steadily becoming an important cog in the economy. This view is based on the perception that all the other factors are replicable and can sometimes be substitutable. Conversely, knowledge is the only organisational asset which is difficult to replicate. Thus, knowledge is an essential competitive advantage for progressive organisations since organisations of the future will be differentiated by what they know, how they are using what they know, and how fast they are learning new things.

The knowledge area can be expected to be one of the major growth areas of the future. Considerable decisions of the political, social, and economic nature will continue to be driven by information and data. Such information and data will have to be readily available to facilitate the necessary decision making processes. This will call for availability of professionals in the field of information and knowledge management with the requisite qualifications. In order to cope with the future expectations, curricula in information and knowledge management will need to anticipate the growth of the profession into the future.

Knowledge is power. Yes, it controls access to opportunities and growth. It is at the core of all organisational assets. It is the essence of what organisations sell or buy; the real raw materials with which organisations work. However, organisations can only benefit from this power if they do not just do things differently. Instead, they must do things better, based on what they know. One of the ways organisations can create economic value using what they know is by turning information and knowledge into unique skills, services and products that the market needs and are ready to pay for, however expensive.

They must tap into the knowledge held by their employees and other publics acknowledging that although no one knows everything, everyone knows something.

Information and knowledge management professionals have a great part to play in the realisation and sustenance of the knowledge economy. They can play this part by creating knowledge environments which foster creativity and innovation. Such environments have credible knowledge resources; technological tools facilitating anywhere, anytime access and use of information and knowledge resources; policies facilitating effective interactions, sharing and learning; as well as capacity strengthening programmes which empower users of information and knowledge to seek, identify, evaluate and select credible knowledge resources and partners. In this effort, the information and knowledge management specialists must understand that it is the connection with stakeholders and partners which makes the difference; not the collection. Similarly, there is less to fear from outside competition than from inside inefficiency, miscalculation and lack of knowledge.

This book elaborates the emerging trends in the broad professional field of information and knowledge management. There is no doubt that information and knowledge professionals will find the book useful especially as they seek to participate and contribute to the fast growing field of information and knowledge management.

PROF. DR.-ING. FRANCIS W.O. ADUOL
VICE CHANCELLOR
THE TECHNICAL UNIVERSITY OF KENYA

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Section One: Emerging Trends in Libraries and Information Centres

Use of ICTs in Accessing Information by Researchers in Selected Public Research Institutions in Kenya

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Abstract

Although several initiatives and efforts have been made to assist researchers in accessing information in public institutions in Kenya, they are still disadvantaged because of limited access and use of ICTs to facilitate research activities and improve the base for strategic decision making. The aim of this chapter is to investigate the use of ICTs in accessing information by researchers at the Kenya Industrial Research and Development Institute (KIRDI) and the Kenya Medical Research Institute (KEMRI) and suggest a framework to improve ICT utilisation at the two research institutions. The use of ICTs in accessing information by researchers in public research institutions in Kenya remains under-researched. This study was designed as an investigative research using a multiple case study approach. The respondents were selected through purposive sampling. Data were collected through semi-structured interview schedule. Data were analysed through a combination of qualitative and quantitative techniques. The study highlights information needs of researchers, resources available to them; utilisation of ICTs and challenges experienced while accessing information using ICTs. The authors suggest a framework for improved ICT diffusion and utilisation. ICTs contribute to globalised economy by enhancing access to information and knowledge which are critical elements in research. This chapter provides practical considerations on the utilisation of ICTs to access information in public research institutions in Kenya. The findings are expected to be of help to top management of public research institutions to inform decision making so as to improve access to information by researchers and other stakeholders.

Keywords: *ICTs, information access, researchers, Kenya*

Introduction

Information Communication Technologies (ICTs) have become drivers of economic development. Their access and application enable information generation, manipulation, processing, utilisation and application. Kagoda-Batuwa (1998) observed that information and communication are the engines of sustainable growth and development, while Mutula (2004) observes there was disparity in access to ICTs between countries and communities resulting into a digital divide in the development agenda in Sub-Saharan Africa. In Botswana mobile telephony phenomena was improving lives of rural communities by enhancing entrepreneurship (Mutula, 2008).

The Government of Kenya emphasises that ICTs are central to the globalisation process and calls upon Kenyans to utilise the opportunity of information age to strategically position themselves to benefit from global economy (NDP, 2002-2008). The government anticipates that the use of ICTs would increase industrial productivity, creativity, innovation, service efficiency, lower disease burden, poverty reduction and job creation. The intention is to establish strong community-based information systems to facilitate access to health-related information and outreach programmes under flagship projects on revitalisation of health infrastructure. Researchers need to access and use health, industrial and technological information to help Kenya realise its Vision 2030. The government promised to integrate ICT programmes in national development planning to secure maximum contribution to the country's development and poverty reduction.

The Kenya Vision 2030 (GoK, 2007) recognises the role of science, technology and innovation in modern economy. New knowledge plays a central role in boosting wealth creation, social welfare and international competitiveness. Information is vital for sound planning and decision making at all levels and in all sectors including educational and professional development of the people. ICTs hold lots of opportunities for development at all levels.

In the National Development Plan (NDP, 2002-2008), the Government of Kenya stressed the need to address universal access to information through the Internet in order to bridge the digital and knowledge gap (GoK, 2002). The internet is a reservoir of information on practically every topic of interest. Websites, emails, electronic bulletin boards, and online databases are significant in the acceleration of research and development in scientific fields as they provide researchers with a broad range of information services including efficiency in the management of rural enterprises and saves time and travel costs. In a similar study Odero-Musakali and Mutula (2007) observed

that the Internet has been praised for its potential to revolutionise learning and research processes. They argue that it paves the way for new methods of information accessibility, as well as providing new instructional approaches, new forms of communication and working environments among others. The Government of Kenya plans to use ICT as a strategy to instil efficiency in the delivery of public services (GoK, 2007) in order to make the services more accessible and affordable.

Kenya has several research organisations serving various sectors. The public research institutions are funded by the government, and are established under the Science and Technology Act, Cap. 250 of the Laws of Kenya which was enacted in 1977 to provide for the establishment of national research institutes. The National Council for Science and Technology (NCST) was established as a statutory institution to advise the government on all matters relating to national science and technology, and coordinate research, innovation and experimental development. They include KIRDI, KEMRI, Kenya Forestry Research Institute (KEFRI), Kenya Agricultural Research Institute (KARI), and Kenya Trypanosomiasis Research Institute (KETRI). KIRDI and KEMRI were chosen for in-depth study due to their direct contribution towards the welfare of the Kenyan populace in industrial and health research respectively.

Rationale

Many governments believe that declining digital inequalities and economic development are inter-related, giving indications of poor planning and management of ICTs resulting from non-involvement of target audiences, inadequate infrastructure, training and technical requirements. In Kenya the situation may not be different since the use of ICTs by researchers can open new channels of service delivery in e-government, education, e-health and information dissemination in the agricultural, industrial, manufacturing and health sectors. Although several initiatives and efforts have been made, many researchers in the country are still disadvantaged because of limited access and use of ICTs to facilitate research activities and improve the base for strategic decision making.

The specific objectives of the study were to:

1. Establish the range of information required by researchers;
2. Examine information sources and services available to researchers;
3. Determine the levels of their usefulness to researchers;

4. Find out if institutional ICT policy exists and how it supports information access; and
5. Establish the challenges experienced by researchers in utilising ICTs to access information and propose a framework for improved ICT diffusion and utilisation.

Overview of Literature

Information as a resource affects all disciplines globally whether scientific or social. Obioha (2005) asserts that as humankind developed an urge to seek ways to better their lives, they made discoveries of ICTs in science and technology; brought innovation into information seeking and knowledge acquisition as they are crucial in facilitating research activities in any country. Sulaiman, Hall, Kalaivani, Dorai and Reddy (2011) observed that traditional ICTs like radios, television and print media are still used in rural areas to introduce new ideas and improve practice in development efforts, particularly the agricultural sector where ICTs offer a key mechanism for putting research-derived ideas, information and technology into use. They noted that researchers and other professionals use Geographic Information Systems (GIS) in planning interventions in agriculture, forestry and geology, while they use email, audio and video conferencing for quick and interactive knowledge exchange.

Odini (1995) observes that to stimulate the use of information, there is need for improved access to information and for the availability of information at the right time and in an appropriate format. He adds that one of the hindrances to information access is the underutilisation of information owing to inappropriate analysis of needs of users and communication process for any group of users. He identified four groups of information users, namely (1) professionals in various fields (who include scientists, engineers and lawyers working in government organisations, private sector and industry); (2) students, teachers and technicians; (3) policy makers, planners and administrators; and (4) farmers and rural communities. He suggests that to stimulate information use, the information service should as far as possible be built around users and the environment in which the communication process takes place.

Murugesan and Balasubramana (2011) observe that most library users in Tamilnadu use email, internal databases, e-journals, e-books, CD-ROM databases, online databases and web based resources. They reiterated that the information age has made a great impact on research and development

libraries since many researchers showed preference for ICT application. Ahmad (2011) notes that researchers use social networks like blogs to establish online communities and provide information about their networks and business. According to Kaddu (2004) ICTs provide an ideal bridge for matching demand and supply of information by helping recipients in locating strategic information. Banks (2011) mentions the power of mobile phones and Internet in data collection and information sharing in the rural communities and how they are transforming health, conservation and research around the world. Doucleff (2012) narrated how researchers in Kenya used mobile phones to track malaria and flu seasons as well as monitor blood sugar by mapping junk food that people eat at night. He stated that researchers at Harvard School of Public Health tracked texts and calls from about 15 million mobile phones in Kenya and used the data to make a map of how malaria spreads from the regions to mega cities.

Theoretical Framework

Theory supported with data or evidence raises hopes about past concepts or ideas meant for a study. Kombo and Tromp (2006) noted that it provides a generalised explanation to an occurrence and clarifies why things are the way they are. Maxwell (2005) affirmed that it is a model of what is out there that a researcher plans to study including what is going on with the things and why. Information as a concept takes different forms at different levels. Wilson (2002) noted that information should not be taken as a unitary concept on its own, but as having different levels around which different theories are built and practices evolve.

The authors combined the General Systems Theory (GST) and Diffusion of Innovation (DOI) to interrelate how KIRDI and KEMRI as institutions are systems that depend upon ICTs to meet information needs of their researchers. DOI theory provides a good tool for descriptive research and has potential for application in information technology concepts. It has been used to study the adoption of ICTs in organisational and instructional technology. According to Minishi-Majanja and Kiplang'at (2005) DOI is a social process of communication in which innovation in the form of new ideas, practices, objects or products is spread. The study used GST and the DOI theory to illustrate and interrelate how KIRDI and KEMRI as institutions deal with different research disciplines, while maintaining some information systems, either generated from within or acquired from without. They depend upon ICTs to effectively meet the information needs of their researchers for development and applied research activities carried out by humans.

Methodology

An in-depth study of KIRDI and KEMRI was undertaken. The two institutions were chosen due to their direct contribution towards the welfare of the Kenyan populace in industrial and health research. The study employed qualitative research method using a multiple case study strategy because it allows in depth and detailed study of more than one study that can be looked at as a whole. Yin (1984) affirms that the approach gives meaningful characteristics of real-life events like individual life cycle, organisational and managerial processes, neighbourhood change, international relations, and maturation of industries. Purposive sampling technique was used in identifying respondents. Data were collected through face-to-face interviews using a semi-structured interview schedule, observation and document review.

The study population consisted of top managers, researchers and information workers. A total of 152 respondents comprising 115 researchers and 37 key informants were interviewed. A combination of qualitative and quantitative techniques was used to analyse data. The study was limited to selected public research institutions; therefore some of the results may not be generalised to other research institutions including international ones.

Findings and Discussions

Presented hereunder are results on the use of ICTs in accessing information by researchers in the two study organisations based on the study objectives. In certain instances the data for each case is separately presented in order to highlight issues raised by researchers. Some statistical data are presented in tables and figures. Table 1 illustrates the wide range of areas of specialisation by researchers in one of the study organisations. The pattern although in health sciences is similar in both cases. The term researcher referred to those working in the departments as shown in the table below.

Table 1: Distribution of Respondents at KIRDI (n=60)

Departments / Centres	Title	Number of Respondents	Percentage (%)
Engineering Design and Services Centre	Researcher	6	10
Leather Development Centre	Researcher	8	13
Ceramics	Researcher	2	3
Laboratory Services Centre	Lab. Technologist	2	3
Energy and Environment	Researcher	7	12
Food Science and Technology	Researcher	15	25
Textile	Researcher	3	5
Law	Head of Intellectual Property	1	2
Water Quality Control and Management	Technologist	1	2
Mechanical Engineering	Researcher	4	7
Industrial and Allied Technologies	Researcher	5	8
Food and Technology Division (Western, North Eastern & Regions)	Researcher	6	10
Total		60	100

The respondents from KIRDI were spread across several commercial service centres and divisions. They were drawn from three main departments: Technology Transfer, Innovation and Extension Services; Research and Development; and, Finance and Administration. The Department of Research and Development had six divisions, namely (1) Food Technology, (2) Engineering, (3) Leather and Textile Technologies, (4) Mineral Resources, (5) Environmental Management.

KEMRI which was the second study organisation had a total of 55 respondents who comprised of researchers, technologists, medical officers and coordinators. Table 2 provides a summary of categories and distribution of respondents.

Table 2: Distribution of respondents at KEMRI by department (n=55)

Category of Respondents	Title	Number of Respondents	Percentage (%)
Centre for Microbiology Research	Researcher	8	14
Centre for Clinical Research	Researcher	5	9
Clinical Trials Facility	Coordinator	3	5
Epidemiology	Researcher	1	2
Climate and Human Health Research	Technologist	8	15
Centre for Virus Research	Researcher	2	4
Centre for Traditional Medicines and Drugs Research	Researcher	6	11
Centre for Biotechnology Research and Development	Technologist	4	7
Centre for Public Health Research	Researcher	5	9
Entomology	Researcher	9	16
Grantsmanship or Research Funding	Researcher	1	2
Centre for Vector Biology and Control Research in Kisumu	Researcher	2	4
Centre for Geographic Medicine Research in Kilifi at the Coast.	Researcher	1	2
Total		55	100

The respondents from KEMRI were also spread across several centres in the country as shown in Table 2 above. The main department of focus was Research and Development the centres were mainly concentrated within that department, which has representation in coast and western regions of the country. In effect, most of the respondents were drawn from this department.

Information Needs of Researchers

The findings indicate that researchers from the two organisations were involved in various specific research areas within medical and industrial environment, hence needed a wide range of specialised information which was influenced or determined by their daily research activities. Their information needs include current and relevant information on their area of specialisation for carrying out their daily activities. They include information on donor and funding agencies, food processing technologies, chemicals and analysis equipment including protocols, conventions and standard operating procedures. The finding concurs with Leckie, Pettigrew and Sylvain (1996) who noted that the numerous work roles assumed by engineers could lead to different information needs. It also confirms the findings of a study by Haines, Light, O'Malley and Delwiche (2010) in which they established that researchers and clinicians, even those in the same college, often have very different information needs, with clinicians requiring quick, concise information and researchers requiring more in-depth information. Similarly, Odi (2005) found that engineers select sources for information searching and in the ways in which information was used. His results confirm investigations carried out by Otike (1997) on the information needs of lawyers, where he established that their information needs were greatly influenced by the nature of the work they do.

Information Sources and Services Available to Researchers

The study sought to establish the various types of information sources available and consulted by researchers in the two research institutions. The results from separate multi-responses indicate that researchers at KIRDI (Figure 1) consulted various sources. The Internet emerged as the most consulted source as stated by 56 (93%) of those interviewed. It was useful in consulting e-journals databases like Online Access to Research on Environment (OARE). The journals were reportedly consulted by 48 (80%), magazines and newspapers by 29 (48%), while patents were consulted by 22 (37%). The books were found to be the popular source of information among 49 (82%) of the respondents, with only 39 (65%) stating that they consulted directories.

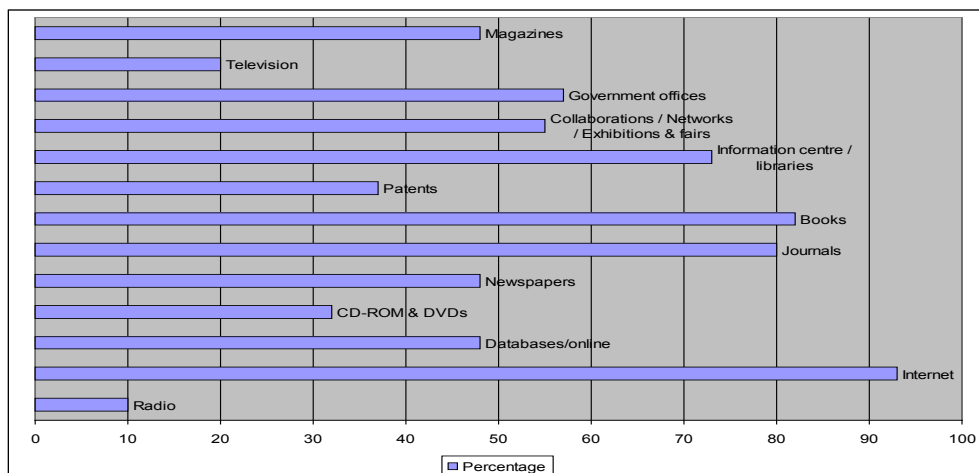


Figure 1: Information sources consulted by researchers at KIRDI (multi-responses)

Source: Authors (2016)

With regard to information services, 44 (73%) of the respondents reported that they visited libraries and information centres.

At KEMRI (Figure 2), again the results indicate that Internet is the most popular information source consulted by 50 (91%) of the interviewed respondents. Respondents used the Internet to access electronic medical and health journals to know what had been published, and to keep in touch with peers and friends through emails and social networking sites like Facebook and LinkedIn. Journals were consulted by 43 (78%) of the respondents who reported using journals such as African Index Medicus (AIM), the International Index to African Health Literature for research. Out of the interviewed respondents 10 (18%) consulted newspapers for news update, while 4 (6%) used magazines to explore topical issues. Another 5 (8%) utilised the radio for current affairs and news items. Only 4 (6%) consulted patents during research.

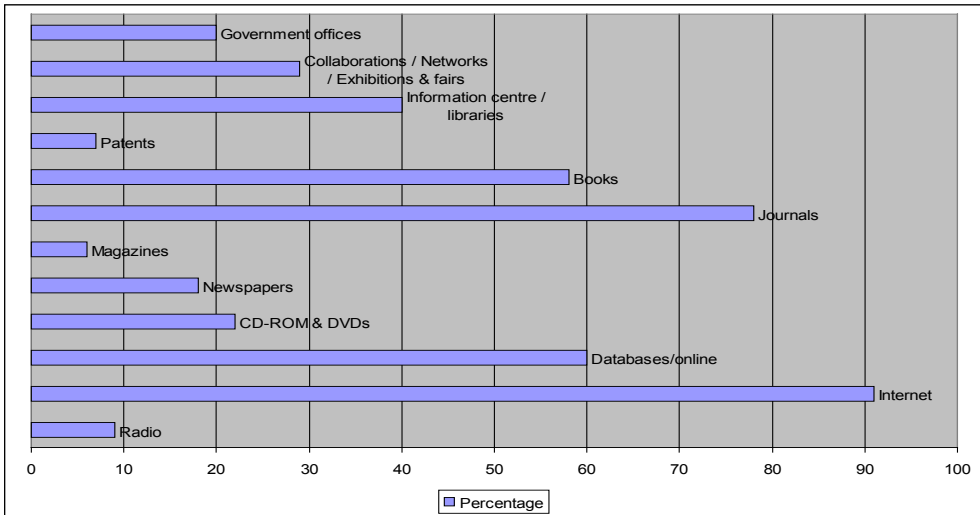


Figure 2: Information sources consulted by researchers at KEMRI(multi responses)

The findings indicate that the major sources of information consulted by researchers include primary and tertiary sources consisting of journals, reports, notes, information on protocols, conventions, and standard operating statistical procedures. Journals were the most consulted and the findings are consistent with those of Zawawi and Majid (2001) who investigated information needs and seeking behaviour of the IMR Biomedical Scientists in Malaysia and established that biomedical scientists use a variety of information sources to satisfy their information needs and that journal articles were the preferred information source. The researchers needed and used reference materials like textbooks, almanacs, directories, encyclopaedias, patents, reviews, manual, reports and the Internet. Mishra (2011) established that scientists preferred to use periodicals. Similarly, Nelson and Adams (1973) found that journals and professional colleagues were the main source of scientific information. Gatero (2008) established that physicians' information needs were catered for through a variety of information sources like professional colleagues, textbooks and journals, Internet resources and pharmaceutical representatives.

In Iran, Hasoomi, Abbasi and Toudar (2011) revealed that 69.7 per cent of researchers mainly use articles for conducting research projects and updating their field-related information. They asserted that differences in information needs are caused by difference in job and field of activity. These findings are consistent with Leckie *et al.* (1996) that information need is not constant

and can be influenced by a number of factors like age, nature of profession, specialisation, career stage, working environment and type of task the individual performs. Similarly, Otike (1999) found that experience had a considerable influence on the information needs of lawyers, while Odini (2005) argued that information seeking should be viewed mainly from the perspective of the engineer and his work tasks which are responsible for generating information needs which can be best satisfied through personal contacts and informal documentation. In this study the respondents who had worked for a period of up-to 4-years indicated that the available sources of information guided their development of research concepts and review of knowledge. The sources met between 50% - 95% of most researchers' information needs.

Availability and Extent of Use of ICTs

The authors sought to establish the range of available ICTs that researchers used and to state which of them best met their information needs. The results revealed the existence of a wide range of ICTs used by researchers to carry out their daily research activities, although still inadequate, accessed from their offices and other designated points within the organisations. When asked to state their perception on value and use of ICTs to access information, and how useful ICTs were in terms of their research information needs, the multiple responses shown in Figures 3 and 4 for respondents from KIRDI and KEMRI respectively show similarities.

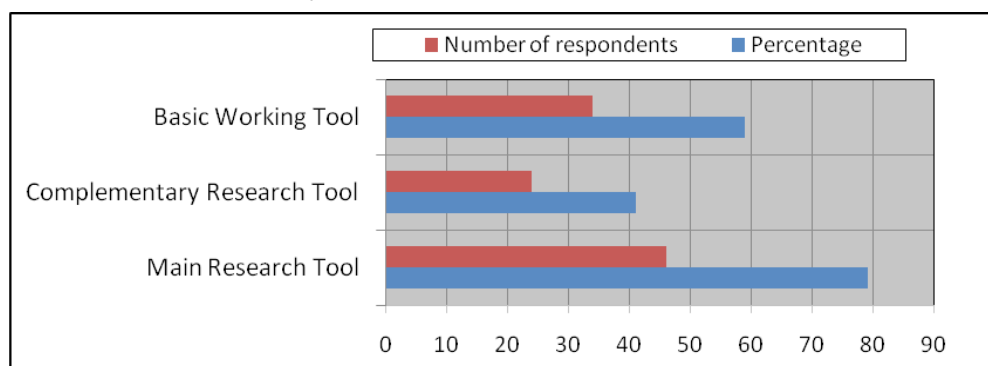


Figure 3: Researchers perception on use of ICTs at KIRDI (Multiple responses)

Figure 3 indicates 46 (79%) of the respondents regarded ICTs as their main research tools. Another 34 (59%) stated that ICTs were their basic working tools, while 24 (41%) considered ICTs as their complementary research tools.

The study revealed that most researchers highly regard the use of ICTs in their search for information for research. This is confirmed from 39 (67%) of the respondents who said that ICTs were:

“Very effective in accessing industrial information although some industries were not ICT compliant, thus secretive with their information.”

“Important when searching for information outside Kenya especially on suppliers of equipment, although there was minimal local content.”

Some of the respondents stated that ICTs were:

“Fairly effective research tools in reviewing existing knowledge”

“Better than other sources of information”

“Effective as they give most of the information one desires”

The results from KEMRI repeated the same pattern as shown in Figure 4.

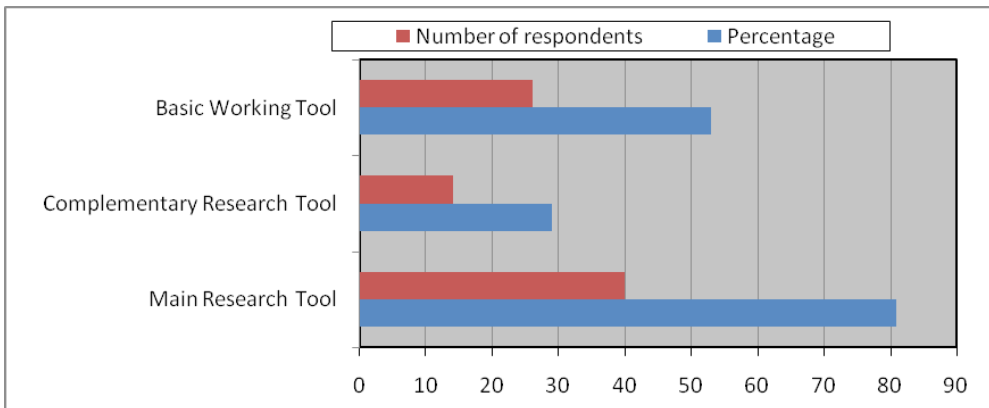


Figure 4: Researchers perception on use of ICTs at KEMRI (Multiple responses)

The majority 40 (81%) of those interviewed regarded ICTs as their main research tools. Another 26 (53%) stated that ICTs were their basic working tools, while 14 (29%) felt that ICTs were their complementary research tools.

The results indicate that researchers use ICTs mainly to carry out research work and regard them as their main working tools for research. This was a major finding common to researchers from the two institutions. Both organisations had a department of IT and ICT laboratory, an indication that

the decision-makers were concerned with the subject of ICT utilisation. A deliberate attempt was made by the two case study organizations to provide researchers with some computer facilities or incentives such as interest free loans to purchase them.

Researchers used the Internet for research and to access information and to know what has been published and to keep in touch with peers and friends through emails and social networking sites like Facebook and LinkedIn. The Internet was the most useful in accessing electronic journals, both current and retrospective, although print copies are also still used. This finding concurs with the views of Royall, Schayk, Bennett Kamau and Alillio (2005) who observed that the Internet constitutes a new and attractive channel for accessing the latest in scientific information as it offers researchers and students an immediate access to a wide variety of research publications.

The available ICTs included computers (both desktop and laptops) and Internet for accessing online databases and websites. This finding is consistent with a related study by Papzan and Yaghoubi (2008) who established that faculty members used electronic information sources, especially those skilled in computer use and Internet surfing. Similarly, Royall *et al.* (2005) established that the Internet constitutes a new and attractive channel for accessing the latest in scientific information.

Devices used for storage and capture included Personal Data Assistants (PDAs), external/flash disks, CDs/DVDs and servers. They were used to avoid loss of research data, which could be caused by virus attacks and power outages. Cameras were also found to be useful in capturing research events and pictures for illustration. The results revealed that the use of mobile phones for scientific and social communication was on the increase and that phones were popular for communication among colleagues and peers. It was established that researchers at KIRDI use mobile phones to monitor fish catches and market prices, while those at KEMRI used them to monitor malaria cases with patients and partner interaction like pharmaceuticals for news alerts and monetary transactions such as payment of field allowances or per diems to research assistants using mobile transfer services such as Mpesa or Airtel Money. Similarly Tewari *et al.* (2008) established that mobile phones were used to capture a dysrhythmia occurring intra-operatively in a patient for the consultant in charge, and argued that mobile phones are an inseparable companion for doctors worldwide.

The findings further indicate that radios, television and video technology were used for recording and watching documentaries and as sources of current information on topical issues.

The respondents indicated that the available sources of information met between 50% - 95% of their information needs. The available sources included the library, Internet, external databases like OARE, HINARI, and Pubmed, journals, books, notebooks and patents among others.

Institutional ICT Policies, Information Access and Use of ICTs

The findings indicate that although the institutions were at the point of drafting ICT policies, their existence were not known to the majority of their researchers, yet they were aware of some restrictions on use of ICTs to access information. The findings further indicate that researchers were required to employ committal signatures on fair use of ICTs or use of passwords and that only staff had access to them for official use and equally expected to protect their Internet and email accounts when accessing and exchanging information with peers. They were expected to visit only authorised sites on the Internet. The policy also required researchers to scan their flash disks to protect their data from viruses. These facts had both positive and negative effects on researchers. On one hand they encouraged researchers to make use of ICTs without security fear on account of hacking and data loss. On the other hand, restriction on unauthorised sites such as Facebook limited researchers from social interaction with their peers and colleagues.

Challenges Experienced by Researchers in Accessing Information

The study findings established that access to needed information was not always an easy task for researchers. Whereas most researchers had no problems with accessing the required information, some did not get access with ease. The results revealed that some researchers needed assistance to access information using ICTs. This was due to lack of proper ICT skills and training. Researchers also experienced the challenge of pay per use on electronic resources which turned out to be too expensive; and required constant subscription to e-journals coupled with denial of full access to use e-books.

Other challenges include inadequate or lack of Internet connectivity frequent cases of server down time and unpredictable Internet connectivity, poor infrastructure, ICT capacity and low bandwidth. Slow speed of the Internet hampered their ease of communication since services could not be resumed in

good time after interruption. The researchers also complained of experiencing frequent blackouts or power outages resulting in loss of data.

The institutional ICT policies had challenges ranging from establishment, implementation, enforcement and frequent revision involving the researchers as users of ICTs. The researchers' complaints about a number of restrictions levied on them such as restrictions on the use of social networking and other sites during working hours.

Use of ICTs to Improve Information Access and Use

The study findings indicate that computers and accessories should be made accessible to researchers and other staff including those in rural stations since ICTs are main, basic and complementary research tools. The researchers singled out Internet connectivity and accessibility as an area that is to be improved and be made available 24 hours. They preferred the use of fibre optic cable technology to improve connectivity and bandwidth, supported by wireless connection. The findings also indicate the need for the use of Internet connection through mobile phones to improve access to and use of information, and that the management should spearhead the use of ICTs and facilitate interconnection beyond the office through modems and purchase of airtime. This finding confirms Marcus, Ball, Delserone, Hribar and Loftus (2007) who established that researchers depend largely on online resources and rely upon libraries' online presence both at work and at home.

The findings also indicate that research institutions should avail the needed resources when they are required, and desire to have subscription renewal to electronic resources like journal and books done including those that give free access like AGORA, HINARI and OARE, among others, for easier access to quality information.

The findings also indicate that ICT competency was one of the impediments to the access and use of information and suggested that there is a need for investing in continuous training in the form of seminars, workshops or conferences for researchers and other users to enhance their ICT skills.

One of the findings indicated that the budget needed to be adjusted upwards to ensure the provision of sufficient ICTs and up-to-date facilities for enhancing information access and use particularly subscription to e-resources and updating the obsolete information resources.

Furthermore, the findings also indicate that anti-virus software and other applications be provided for researchers as a solution to data security or automated data protection to reduce risks and operation costs. Marcus *et al.* (2007) echoed the findings and stated that researchers are usually frustrated by the lack of a standard to guide their quest to make data more accessible.

Conclusion

Researchers' information needs vary due to their different areas of specialisation. They use a wide range of ICTs to carry out their research activities. They recognise ICTs as their main working tools. They should therefore be made available to them to enhance their information access. This would assist research institutions in the diffusion of ICTs among researchers, as well as the use of cloud computing for archiving and storage services. Low ICT literacy skills in some instances hampered ease of access to information. The results herein clearly resolve that continuous training to upgrade literacy skills and the use of Internet as an alternative for improvement.

Recommendations

Based on the study findings, the following recommendations were made as suggestions for a framework to improve ICT diffusion and utilisation:

Policy makers

To carry out an ICTs training needs assessment in order to map out the necessary skills required by researchers in the two study organisations to enable them cope with the dynamism of ICTs in view of the fact that ICTs have become basic as well as main working research tools for the researchers and hence the need for improvement on access to information required by researchers for their daily research activities. The issuance of loans to purchase laptops should be emulated by other research institutions as they help in the adoption and diffusion of ICTs.

Allocation of adequate budgets to cater for ICT needs of researchers at the two institutions to enable ICT personnel to acquire adequate ICTs for use by all researchers and other staff working in satellite stations. Concerning data storage, loss and security, it is recommended that research institutions should secure large servers from the allocated budget while considering cloud computing. The budget should be adequate to cater for the training of the ICT personnel and continuous training in ICT skills for researchers and support staff, improved ICT infrastructure in line with the modern trends, software updates and renewal of various licenses.

The authors recommend a participatory approach in the development of ICT policy by involving researchers since the policy document directly affects their information access. The policy should act as a general guideline on the use of ICTs while enhancing information access and use of ICTs within the institution. The use of social networking sites should be positively received since researchers use the sites as invaluable sources of research information. They should also subject the policy to constant review and strengthen it on the use of ICTs.

Information Workers and ICT Personnel

Traditionally researchers communicate their research findings as peer reviewed articles in both local and international scientific journals. However, with the dynamism of technology there is need for improved communication between researchers or end users of research products. It is therefore important that information workers and ICT personnel explore opportunities of developing online communication tools to meet these needs. Whereas information workers strive to hold face-to-face training with the researchers on the use of e-resources, the ICT personnel should upscale the practice through introduction of e-learning via the institutions' websites or do-it-yourself kits that may be given to researchers to practice on their own from the labs or offices.

Information workers need to provide required information by making subscriptions to relevant information sources including electronic databases like OARE, HINARI and PubMed. Research institutions libraries should join /or renew membership to existing information consortia in order to reduce or review costs for access to the various pay per use electronic information resources such as e-journals and e-books. This would go a long way to increase access to information resources, encourage the use of ICTs and enhance the diffusion of ICTs.

The information workers do a commendable job on training researchers on how to retrieve print and electronic resources. However, it is recommended that the trainings should be continuous so as to ease access to required research information. The training can be done quarterly so that researchers can make the training part of their daily work to improve their skills in the retrieval of specialised information for research in the research institutions.

The ICT personnel should carry out improvement on the web-based infrastructure like the Internet, including the bandwidth, to reduce downtimes on the service and thereby enhance the reliability of the facility.

The institutional ICT support should ensure that researchers have unlimited Internet connectivity for 24 hours a day 7 days a week by tapping onto the fibre optic cables, while considering cloud computing for information storage.

Data security is quite an issue in research as highlighted by researchers. ICT personnel should provide updated antivirus software and also provide application software to researchers in order to protect data either on the network or in the storage, while reducing risks and operation costs.

Researchers

Having made a strong case that ICTs have become basic and main working research tools, researchers should explore more innovative ways of using ICTs to get credible results in research. They should publicise the use of ICTs to other researchers and the general public in order to enhance their diffusion and use among the general population as well as communicate from the same platform.

Based on the findings of this study researchers need to raise their voices on issues that hold them back from positively using ICTs to access information for research. They need to consider undertaking continuous training in computer skills in addition to their professional skills upgrading in order to improve their access to specialised information in the case study organisations.

Researchers should consider depositing their data and published articles from peer reviewed journals in the institutional repositories. This would enable them to share their findings with others and to contribute to the development of the institutional information data-banks or archives.

Researchers working in the public research institutions should push for a participatory approach towards the involvement of ICT policies in order to advise and share their concerns on scientific issues like responsibility, conformity, privacy, disposal of (equipment including e-waste disposal) which is determined by various factors. The researchers should use social sites responsibly in order to convince the administrators that such sites are an invaluable source for research information.

Practical implications

These results are expected to be of help to information professionals, top management and various stakeholders of research institutions to inform decision making so as to enhance the diffusion of ICTs and improve access to information by researchers.

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The Use of ICTs to Support Knowledge Management in Selected Academic Libraries in Nigeria and South Africa

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Abstract

Information and Communication Technologies (ICTs) are increasingly used to support information services in a variety of ways. This chapter discusses the dimensions of ICT for the support of knowledge management (KM) in sampled academic libraries in Nigeria and South Africa. Both quantitative and qualitative research methodologies were applied in the study that informs this chapter. A quantitative approach through survey research, by use of questionnaires for data collection, was used together with a qualitative approach through observation and qualitative content analysis, by document and literature analysis and interviews. A total of 171 professional librarians and six key informants across libraries in the two countries were targeted for information and the majority of them responded. Findings revealed that ICT tools used to support knowledge management varied among the universities. The use of new technologies in academic libraries is fast growing with the sampled South African academic libraries leading. A comparison of the six libraries revealed that each one had its unique ICTs/library facilities, structure, resources/collections, policy, services, and staff categories. The interview and observation results provided additional information on the use of new technologies for easy access and support systems for the management functions of the libraries. We recommend that staff development be intensified to cope with changes brought by new technologies in order for modern information services to be embraced. The challenges identified in the study should be turned into opportunities to solve the rapidly growing ICT requirements for KM in libraries.

Keywords: *ICTs, knowledge management, university libraries, Nigeria, university libraries, South Africa*

Introduction

The use of ICTs for knowledge management in academic libraries has been discussed in details by Enakrire in recent studies (Enakrire, 2015 and 2016). The researchers recognised that both Nigeria and South Africa which are leading research countries in their regions have a large number of universities with established libraries with different levels of development. For example, in Nigeria, as of 2012, there were 124 universities categorised into 37 federal, 37 states and 50 privately governed by the National Universities Commission – NUC, in Nigeria (NUC, 2004/2005; 2011). The numbers of universities keep growing (Okojie, 2013:6; NUC, 2014). South Africa has 25 public universities categorised into 11 traditional, 8 comprehensive and 6 technological universities (South Africa info, 2014). Increasingly, ICT is used for knowledge management (KM) in the university libraries.

The potential of ICTs in supporting KM can be highlighted in the followings ways: 1) rapid changes manifested in present-day library operations is beyond human comprehension (Okiy, 2010); 2) a different approach and dimension used to render information services to users (Issa, Ayodele, Abubakar & Aliyu, 2011:3); 3) opportunities to harness and harvest information and knowledge beyond geographical boundaries (Okiy, 2010); 4) effective job performance of librarians manifested in routines of administrative work, acquisition, cataloguing and classification, circulation, information retrieval, networking and online sourcing and serial management (Issa, Ayodele, Abubakar & Aliyu, 2011:3); 5) ICTs are widely used to share knowledge and information (Lwoga, 2010:1); 6) it has contributed to socio-economic growth of every nation (Lwoga, 2010:1); and 7) used in decision making, maintenance of infrastructure and software development, content management of resources, policy formulation and implementation and communication networks (Ofori-Dwumfuo & Kommey, 2013; Omona, Van der Weide & Lubega, 2010:1; Emojorho and Nwalo 2009:1&2). These benefits have created an environment that fosters innovation and the sharing of the librarians' knowledge and experience in the present day library environment. The promotion of effective and efficient knowledge management largely depends on the successful utilization of ICTs to support information services (Chisenga, 2006).

Knowledge management is not new to libraries which have managed explicit/tangible/recorded knowledge for generations but library content, services and users have significantly changed due to an increased use of technology for KM in libraries (Ocholla, 2016). There are many benefits of knowledge management in organisations. The benefits can be categorized into the following ways: 1) different approaches and technological know-how used

to create, process and disseminate knowledge in the organisation (Laudon & Laudon, 2010); 2) enabling an environment where intellectual assets of explicit and tacit knowledge of colleagues can be harnessed and shared within the organisations (Ofori-Dwumfuo & Kommey, 2013); 3) collective use of employees' knowledge for job efficiency and effectiveness (Ofori-Dwumfuo & Kommey, 2013); and 4) it helps an organisation to adopt both individual and collective knowledge for organisational growth (Darroch, 2005; Ofori-Dwumfuo & Kommey, 2013).

Aina, Mutula and Tihamiyu (2008) admit that KM fosters innovation through appropriate encouragement of free flowing ideas. The flow of ideas improves customer services that are time-bound and boosts revenues of products and services for the organisation (Aina, Mutula & Tihamiyu, 2008). The recognition of the valued knowledge reduces costs of unnecessary processes in operations. Librarians should use the knowledge gained through experience, reasoning, intuition and constant learning to manage information and knowledge in their academic libraries (Aina, Mutula & Tihamiyu, 2008). Thus, the management of knowledge would not be feasible without proper responsibility of academic libraries, ICT tools and librarians in the library environment (Ofori-Dwumfuo & Kommey, 2013).

Problem and Purpose of the Study

It has been observed from literature that sound knowledge and skills of ICTs enhance the leverage needed for the management of information and knowledge in academic libraries. Also, new approaches to knowledge management are essential to libraries. Unfortunately, many academic libraries are struggling to cope with the access and use of ICTs to gain access to information and knowledge (Itsekor & James, 2012). For example, Akintunde (2006:12) reports that many libraries in Nigeria still operate in the traditional service pattern where librarians are given many responsibilities without "much knowledge, skills and exposure to ICTs". The use of the traditional service pattern by some libraries results in constraints in service delivery, slow processing and repackaging of knowledge as well as poor ICT security policies. Although South Africa has a better established ICT provision in academic libraries (Satgoor, 2015), it still cannot cope with the rapid changes in the access and use of ICTs, particularly the demands arising from the widespread use of Web 2.0 platforms. Knowledge management in academic libraries has to accommodate the new developments and rapid changes (Ocholla, 2016) by demanding more staff, user education and training, information literacy skills, and usage of library spaces. In the midst of the

available ICT tools currently used in most academic libraries, knowledge and skills gaps in applying ICTs still exists among some librarians (Anyira, 2011). Davis and Lundstrom (2011) assert that presently libraries are faced with many challenges, such as a continuous increase of users and thriving to stay relevant and ahead in this information age. This puts libraries in a very tight situation as they are expected to do more rather than less (Lockhart & Majal, 2012:3).

The study on which this chapter is based investigated how, and to what extent, ICTs are used to support KM in the selected university libraries in Nigeria and South Africa. In this chapter, we answer the following three research questions:

1. What ICT and KM facilities, tools and services are available to support KM in academic libraries in Nigeria and South Africa?
2. Do academic librarians in Nigerian and South African university libraries have the required knowledge and skills to use ICTs to support knowledge management?
3. What challenges do academic libraries in Nigeria and South Africa face in the use of ICTs to support KM?

Methodology

The study was informed by the positivism and interpretivism research paradigm. The quantitative (survey) and qualitative (interpretive and content analysis) research methods were employed. The population for the study consisted of all professional librarians in the sampled university libraries in the two countries. The non-probability sampling grounded on purposive sampling technique was used to select 171 professional librarians in the six university libraries. The six university libraries targeted in the two countries were: University of Ibadan (UI), Federal University of Technology (FUTA), Delta State University (DELSU), University of Zululand (UNIZULU), University of KwaZulu-Natal (UKZN), and Durban University of Technology (DUT). The 171 professional librarians were selected using accidental and purposive sampling technique. This is made up of 38 from UI, 18 from FUTA, 44 from DELSU, 12 UNIZULU, 33 from UKZN and 26 from DUT.

The six university libraries were selected on the basis of first generation universities and university ranking index in Africa as follows; funding and resources of the institution (University of Ibadan library and University

of Kwa-Zulu Natal library); technological orientation (Federal University of Technology library and Durban University of Technology library); as well as rural location (Delta State University library and University of Zululand library). Data was collected using questionnaires, interviews and observation.

The authors administered questionnaires to 171 professional librarians in the sampled university libraries. They also conducted key informant interviews with the heads of departments and units from each of the sampled university libraries. Observation methods were also used to gather information regarding the university libraries' environment, physical structure and location, office space (conduciveness), availability and accessibility of computers and other ICT tools, collections (print and electronic resources), shelving space, size and lighting in the office and attitude of staff towards their work. Of the 171 questionnaires administered among the respondents, 132 (77.2%) were returned. The 132 consisted of 77 from university libraries in Nigeria and 55 from university libraries in South Africa. The 132 returned questionnaires were subjected to statistical analysis using descriptive and inferential statistics.

Results and Discussion of Findings

The results are presented below.

Characteristics of the Respondents

The majority of respondents that participated in the study were female. The reason is that, there were more female staff working in the university libraries sampled (Table 1). Most respondents had Bachelor's and Master's degrees.

Table 1: Distribution of Demographic Data from Sampled Libraries

Variables	Demographic data across university libraries (Nigeria and South Africa)													
	UNI IBAD LIB		FUTA LIB		DELSU LIB		UNIZULU LIB		UKZN LIB		DUT LIB		Total	
	F	%	F	%	F	%	F	%	F	%	F	%	F	%
Gender														
Male	17	26.2	10	15.4	14	21.5	2	3.1	13	20.0	9	13.8	65	49.2
Female	12	17.9	6	9.0	18	26.9	7	10.4	15	22.4	9	13.4	67	50.8
Age														
20-29yrs	2	6.9	0	0.0	2	6.3	1	11.1	1	3.6	1	5.6	7	5.3
30-39yrs	14	48.3	3	18.8	12	37.5	1	11.1	8	28.6	8	44.4	46	34.8
40-49yrs	11	37.9	9	56.3	12	37.5	3	33.3	13	46.4	6	33.3	54	40.9
50-59yrs	2	6.9	3	18.8	6	18.8	4	44.4	5	17.9	2	11.1	22	16.7
60yrs & above	0	0.0	1	6.3	0	0.0	0	0.0	1	3.6	1	5.6	3	2.3
Qualifications														
Bachelor's degree	8	18.2	6	13.6	13	29.5	5	11.4	7	15.9	5	11.4	44	33.3
Honours degree	0	0.0	0	0.0	0	0.0	2	13.3	9	60.0	4	26.7	15	11.4
Master's degree	18	28.1	9	14.1	15	23.4	2	3.1	11	17.2	9	14.1	64	48.5
PhD degree	3	33.3	1	11.1	4	44.4	0	0.0	1	11.1	0	0.0	9	6.8
Position/rank														
University Librarian	0	0.0	1	100	0	0.0	0	0.0	0	0.0	0	0.0	1	100
Dep. Uni. Librarian	1	50.0	1	50.0	0	0.0	0	0.0	0	0.0	0	0.0	2	100
Principal Librarian	3	33.3	2	22.2	1	11.1	0	0.0	3	33.3	0	0.0	9	100
Senior Librarian	7	17.5	0	0.0	2	5.0	2	5.0	18	45.0	11	27.5	40	100
Librarian I	2	22.2	3	33.3	3	33.3	0	0.0	0	0.0	1	11.1	9	100
Librarian II	5	26.3	3	15.8	7	36.8	2	10.5	1	5.3	1	5.3	19	100
Assistant Librarian	1	9.1	0	0.0	7	63.6	1	9.1	2	18.2	0	0.0	11	100
Chief Library Officer	0	0.0	1	33.3	1	33.3	0	0.0	0	0.0	1	33.3	3	100
Senior Library Officer	1	16.7	2	33.3	1	16.7	2	33.3	0	0.0	0	0.0	6	100

Higher Library Officer	7	46.7	1	6.7	2	13.3	1	6.7	2	13.3	2	13.3	15	100
Chief Library Assist.	2	18.2	2	18.2	3	27.3	0	0.0	2	18.2	2	18.2	11	100
Principal Libr.Of-ficer	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Principal Libr.As-sist.	0	0.0	0	0.0	0	0.0	1	100	0	0.0	0	0.0	1	100
Work experience														
1-5yrs	11	35.5	1	3.2	4	12.9	4	12.9	5	16.1	6	19.4	31	100
6-10yrs	4	10.8	6	16.2	11	29.7	0	0.0	9	24.3	7	18.9	37	100
11-15yrs	10	45.5	4	18.2	2	9.1	0	0.0	3	13.6	3	13.6	22	100
16-20yrs	2	9.5	2	9.5	9	42.9	1	4.8	6	28.6	1	4.8	21	100
21-25yrs	2	18.2	2	18.2	4	36.4	1	9.1	2	18.2	0	0.0	11	100
26yrs and above	0	0.0	1	10.0	2	20.0	3	30.0	3	30.0	1	10.0	10	100

ICT Facilities and KM Tools and Services Supporting KM in Academic Libraries in Nigeria and South Africa

It was hypothesised that there was not a significant relationship between the ICT facilities used by librarians for the support of KM in academic libraries in Nigeria and South Africa. The findings identified different types of ICT facilities in the six sampled university libraries as outlined in Figure 1.

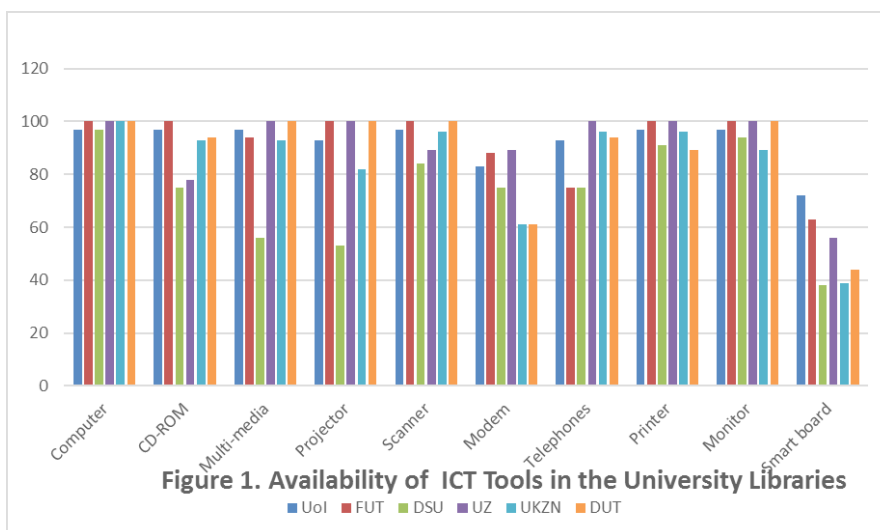


Figure 1: Availability of ICT Tools in the University Libraries

The data is also tabulated in Table 2 below.

Table 2: Availability of KM Tools in the Sampled University Libraries N= 132 (%)

KM Tools	UoI	FUT	DSU	UZ	UKZN	DUT
Decision Support Systems	66	25	31	33	32	56
Word processors	90	94	88	89	100	100
Search engines	90	88	81	89	100	94
Semantic web	59	56	38	78	61	78
Artificial Intelligence Tools	48	31	22	33	32	67
Simulation tools	55	19	16	33	29	50
Data mining	69	13	22	44	43	61
Information Retrieval Tools	83	88	63	78	96	94
Electronic Document Management Systems	72	81	47	89	68	72
Database Management Systems	79	88	47	89	86	78
Data warehouse	69	50	34	78	57	56
Content Management Systems	62	44	31	67	57	67
Management Information Systems	79	81	50	89	75	78
Web portals	83	88	53	56	86	89
Site maps	69	56	31	67	64	83
Bar code reader	69	31	59	89	82	89
Indexing and abstracting	79	75	69	67	86	89

Service provision tools also played a major role. The study established that different KM services were available as represented in Table 3 below.

Table 3: Tools for KM Services N= 132 (%)

KM Services	UoI	FUT	DSU	UZ	UKZN	DUT
Intranet	90	63	75	100	93	72
WWW-Internet	90	88	81	89	100	100
E-mail	90	94	88	100	100	100
Extranet	62	63	56	89	75	72
Video/audio conferencing	62	44	34	56	86	83
Text summarizing	52	25	38	56	50	67
Online/social media	90	75	63	89	96	94
Online public access catalogue	97	88	56	100	93	100
Text messages	83	88	66	100	75	83
Web publishing	76	50	47	89	71	83
File-sharing	72	38	34	67	68	72

Web based technologies were high KM services but social media also provided eminent support. There was, in most cases, insignificant difference in the application of the leading technologies among the sampled libraries which was encouraging. It was revealed that KM services were more accessible in South African university libraries than they were in Nigeria. Findings from the study established that the most effective ICTs/KM tools in the two countries' university libraries were web based.

Knowledge and Skills to Use ICTs to Support KM in Nigerian and South African University Libraries

This section addressed only the questionnaire dataset. Respondents were asked to indicate which information source they used for updating their personal knowledge and the library holdings'. The most frequently used source of updating librarians' knowledge was the Internet and conference papers. The least preferred source was book vendors and library subscriptions. Findings revealed that libraries where the update of knowledge was often practised was UKZN followed by FUT. Findings further revealed that what facilitated librarians' update of knowledge in the various sources mentioned was the exposure to new trends in their work environment. The Chi-square test revealed large values confirming that the differences in the relative level of support were significant. Interestingly, findings suggested that the present day librarianship profession has developed from the traditional methods of access to modern virtual methods, which require librarians to continually update themselves. A study by the World Economic Forum (2014), which supports these findings, notes that the use of Internet computing tools, metadata, and social media helps to track, capture and exchange information without much difficulty. Another affirmation by Ondari and Kitendo (2004:62) argues that services such as web browsing, books and databases, online periodicals, among others, serve as sources of information to users.

As far as the librarians' knowledge and ICT skills were concerned, respondents were asked about indicators of the librarians' knowledge and ICT skills for the support of KM in the field of librarianship. It was established from questionnaire findings that: 1) the predominant understanding of knowledge and ICT skills was their ability to create and store information; and 2) technical skills relate to ability to initiate ideas and use ICT tools properly. On the other hand the rarely exhibited skills were negotiating skills, change management, consensus building and strategic planning. Those skills which were predominant were closely associated with functions that librarians perform. The skills which were rarely exhibited were more of management

skills required at senior levels and acquired based on need and additional training. Librarians in the University of Ibadan had the highest relative skill levels while the lowest ranked university library was the University of Zululand.

Notably, there was no association between training and support provided to librarians on one hand and librarians' skills on the other. The availability of tools and support systems from university management would help staff members to acquire more knowledge to work independently. At the inter-country comparison, librarians' knowledge and ICT skills were linked to each other with great significance. A study by Seena and Sudhier (2014:137-138) affirms that LIS professionals are aware and have knowledge of library automation software. The library automation software consists of LBSYS, database management systems, creation of metadata, MS office package, web page design, skills of KOHA, Alice for Windows, LIBMAS, digital library (Greenstones, E-print, Fedora), OPAC, online journals among others. These are fundamental in today's library operations.

When it comes to librarians' areas of expertise in the support of KM, the most predominant expertise of librarians, as mentioned by respondents in questionnaire dataset, related to OPAC, array of library information services, knowledge of ICT tools and library website and Internet access. It was noted that these skills were advocated for most librarians at the University of Ibadan. University of Zululand gave the least support for these skills. The author affirms that the work ethics/policies of the institutions expect librarians to possess dual areas of specialisation for efficient and effective job performance. It is believed that areas of expertise differ from one individual to another based on the ability to harness multi-dimensional clusters of knowledge. Most importantly, the technological drift and proliferation of information across disciplines account for more than one area of expertise in the Library and Information Science profession today.

Regarding the extent of adequate knowledge, experience and skills of ICTs, it was established that the impact of knowledge and experience was felt more when sharing knowledge, when teaching and where expertise was required. However, the least impact of knowledge and experience was felt when explaining actions and when making a concrete decision. Findings on how often librarians were trained and supported in current knowledge and skills acquisition, in particular, the use of ICTs for the support of knowledge management in the academic libraries, established that respondents were trained and supported in induction, formal education, retraining and

interpersonal development. The least preferred form of training was informal education. It appeared the training support given to librarians was considered unimportant by the librarians. The greatest support to librarians was given by DUT and FUT. Findings revealed that the training and support given to librarians were diverse in context (urban and rural), nature of the training (practical, oral, online, visual, experimental and traditional), paradigm used, friendliness of the training, availability of training resources, complexity of the training and support and comprehensiveness of training in most university libraries. Furthermore, organisations have continued to attract a different calibres of staff across disciplines as a result of analysing the training needs of staff.

Findings suggested that most university libraries today have flourished as a result of the policy, remuneration and services offered which harmonise the learning relationship of colleagues. The findings further revealed that at inter-country level of university libraries, South Africa gave higher support to their librarians than Nigeria. This is surprising as librarians in South Africa do not necessarily seek advanced studies such as PhD when compared with Nigerian librarians who require further formal education for career advancement. These have been demonstrated in Figure 2 below which shows appropriate content and learning methods among librarians in university libraries in both countries.

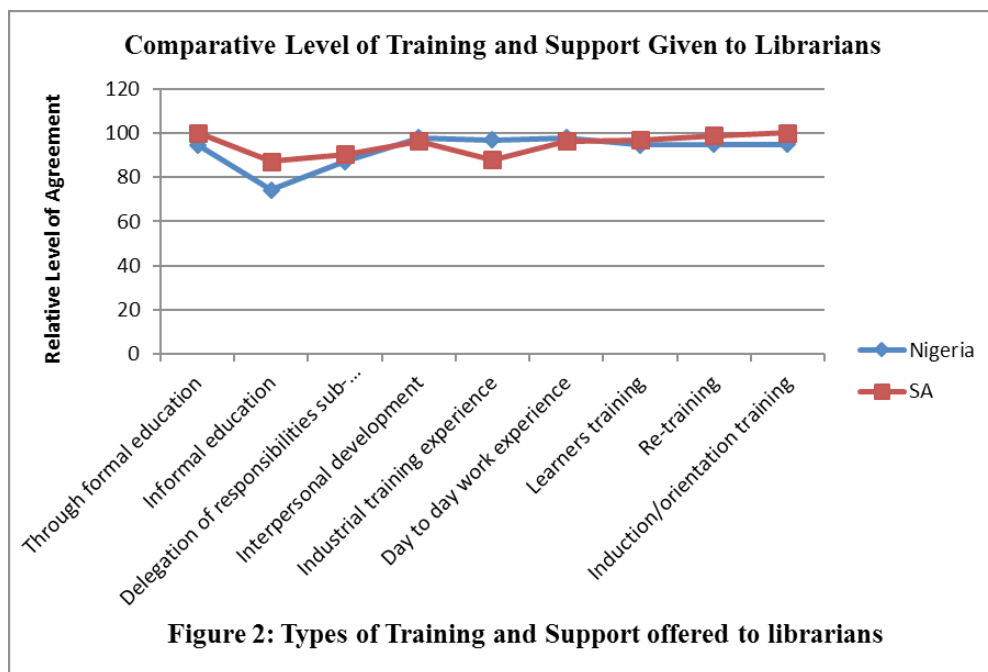


Figure 2: Types of Training and Support Offered to Librarians

Findings from the interview dataset showed a varied and distinct measure from results obtained in the questionnaire. Interviewed informants confirmed that diverse training and support given to librarians cut across strategic policy; capacity building through training and development (in-house, workshop, seminar, review of staff performance, skills and knowledge development), formal training through teaching and learning processes, training in research writing, and support in professionalism and sabbatical leave. Studies by Obasola, Alonge, Evers & Oladele (2014:171-173) support this finding by suggesting that capacity building likened to training and support given to librarians takes place at both the organisational and individual level. It involves proactive abilities, skills, attitudes, principles and practices that facilitate networking across boundaries (Obasola, Alonge, Evers & Oladele, 2014). These training and support programmes are most essential in organisations as they explicitly addresses the needs of capacity building of staff.

Remarks made by Mabawonku (2005) further unveil how training practices offered to LIS professionals vary from one context and institution to another. They are meant for capacity development as a life-long activity. The activities

help to facilitate the support given in teaching, learning and research activities and community development carried out in the library environment. As observed in Obasola, *et al.* (2014), the knowledge gained during workshops has significant effect if followed up at local level. The followed up mechanism could promote collaboration and knowledge sharing among colleagues. Obasola, *et al.* (2014), established that the training and support given during his workshop were on emerging technologies. The implications were how to search and use Google scholar and group, and develop quick response codes, pedagogical skills; IT tools for research, and information literacy. The workshop was also supported with current training materials that would encourage librarians to study on their own after the workshop. However, time and funds were noted to be constraints in organising the workshop (Obasola, *et al.* 2014).

Technical ICT skills for librarians also play a crucial role. The study found that technical ICT skills were believed to be very important in today's library environment. The most prevalent technical skills of librarians were online searching, social media and information management, while the least prevalent technical skills were hardware troubleshooting, programming and software trouble shooting. Notably, knowledge and familiarization with a different set of skills promotes efficiency and effectiveness in any work environment. Findings revealed that the availability of ICT tools, experience, and training exposed to, and attitudes of librarians, techniques and procedures used in operations facilitated acquisition of these skills. At inter-country level, technical skills were more prevalent in South Africa than in Nigeria. Patridge, Lee and Munro (2010) recommend interpersonal skills and attitudinal change. Reflecting on the study by Ezema, *et al.* (2014), it emerged that the attainment of technical skills was evident in the acquisition of more professional training and re-training in specific areas of expertise of the librarians.

General skills for librarians are also crucial. Findings revealed that the most recommended general skills for librarians were familiarity with online sources, customer service awareness, degree in librarianship and ability to mentor other colleagues. On the other hand, the least recommended skills were mastery of a foreign language, negotiating with vendors and traditional reference interviews. At university level, the general skills were most appreciated in the University of Ibadan followed by the University of Kwa-Zulu Natal. At the University of Zululand, the requirement for general skills was least appreciated. These skills were basic requirements for librarians

in university libraries. It was noted that the educational training, work environment, adequacy of funds for staff training, policies that guide the products and services of university libraries enhanced the librarians' general knowledge. Interestingly, respondents noted that the quality of visibility of research collaboration output had improved due to the possession of some of the general knowledge shared by librarians (Ocholla, Ocholla and Onyancha, 2013). This was further affirmed by Ocholla and Ocholla's (2014) study of the need to have cataloguing and classification knowledge in order to function better in libraries.

Regarding personal skills for librarians, the findings revealed that self-motivation, adaptability/flexibility, written communication, verbal communication and approachability and working with teams were the most important personal skills identified among librarians. A sense of humour was rated least relevant, among other skills. At inter-country comparison, librarians at DUT, South Africa, had more personal skills than those in UI, Nigeria. The acquisition of these skills could result in training programmes of conferences/workshops, seminars, orientation, in-house training/mentorship, among others. The qualification, exposure, computer literacy and its application, and experience in job operations were basic requirements in the attainment of personal skills.

Challenges Faced in the Use of ICTs to Support KM in Academic Libraries in Nigeria and South Africa

The most prevalent challenges noted in Table 4, include inadequate funding, lack of motivation, and lack of infrastructure. The least cited challenges include moving to other professions, language barriers, and the ability to work independently. The challenges were most pronounced at DUT and least pronounced at FUT. It was established that inadequate funding had a negative impact on infrastructural development and capacity building. We noted that some of these problems resulted from context (environment), cultural background, lack of maintenance of available infrastructure, and the misplacement of organisational priority.

The results suggested that on average, university libraries in South Africa were experiencing less challenges than in Nigeria. Inadequate funding and infrastructural challenges were more pronounced in Nigeria. Notably, the most critical challenges to address in the use of ICTs for the support of KM included lack of infrastructure, inadequate funds, unreliable electricity, and unreliable Internet. A study by Ajuwon and Rhine (2008) determined that

ICT facilities and the regular training of librarians are essential for the full support of KM in academic libraries.

Interviews with the key informants revealed that the most crucial challenges faced by Nigerian university libraries included inadequate funding, poor or old ICT facilities, and inadequate professional staff. The South African interviewees cited inadequate professional staff, lack of commitment to work, and increased user needs. Evidently, inadequate professional staff was a common problem in both countries' libraries. A worrisome issue that was discussed during the conducted interview was the inability of the management of libraries to act towards the eradication of these problems. Related studies by Agboh (2015), Fink and Disterer (2006), Jones *et al.* (2003), and Khatibi *et al.* (2003), also identify the lack of government support systems, complex procedures, managerial leadership, cost benefits and needs analysis, legal issues, turnover, security, and lack of human capital, among others, to be the most critical challenges in university libraries.

Table 4: Challenges Faced in the Use of ICTs for the Support of KM

Challenges faced in the use of ICTs	UoI (%)	FUT (%)	DSU (%)	UZ (%)	UKZN (%)	DUT (%)	Average (%)
Lack of motivation	90	100	91	89	89	100	93
Lack of trust	86	88	81	89	79	83	84
Inadequate funds	93	100	94	89	96	89	94
Knowledge of subject expert	83	94	75	78	86	83	83
Drift to other professions	72	56	66	67	75	67	67
Lack of infrastructure	93	94	100	89	93	83	92
Lack of organizational growth	79	81	78	89	86	78	82
Lack of self-development	90	94	91	89	82	94	90
Inaccessibility of library resources	86	69	91	100	89	89	87
Inability to cope with changes	93	94	91	89	82	89	90

Insufficient ability to manage knowledge assets	90	69	91	78	82	89	83
Unreliable internet network	90	88	88	89	82	89	88
Unreliable electricity	90	100	97	89	75	89	90
Insufficient KM sources	90	81	84	78	75	89	83
Lack of current trends	79	75	88	78	82	94	83
Language barrier	79	63	59	78	71	89	73
Poor KM practices	83	81	91	89	82	78	84
Lack of personal computer	83	63	81	89	71	94	80
Costs of hardware/software	97	69	84	89	86	94	87
Lack of policy implementation	86	81	94	100	86	94	90
Lack of adherence to instructions	97	69	72	100	96	89	87
Lack of knowledge to use ICTs/web	86	75	91	89	82	94	86
Lack of knowledge of library holdings	79	69	69	89	93	89	81
Inability to understand users' queries	93	75	81	89	93	89	87
Lack of knowledge production	83	81	78	100	89	94	88
Inability to work independently	83	88	63	78	64	83	77

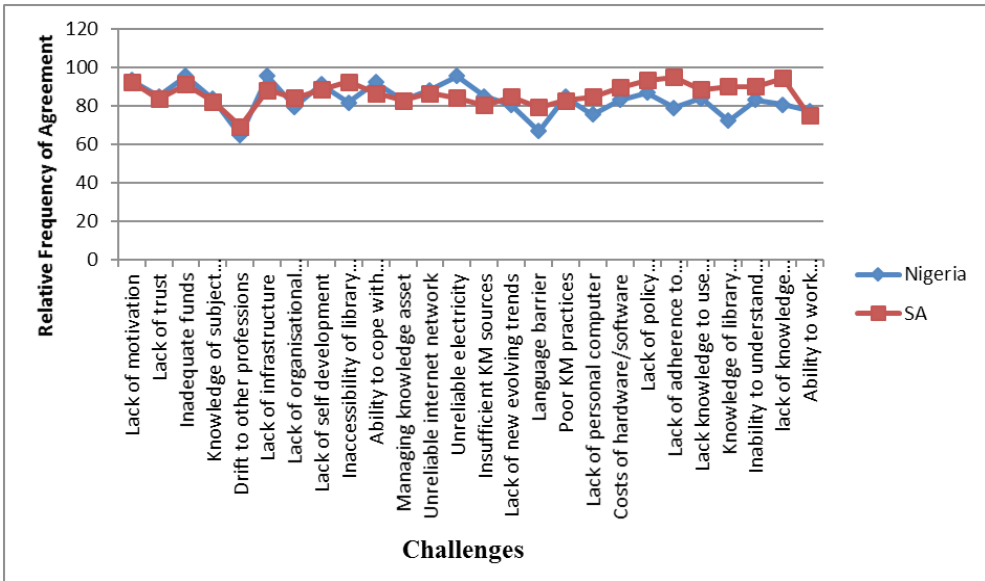


Figure 3: Inter-Country Comparison of Challenges in Using ICTS for the Support of KM

Conclusion

The research established that the availability and accessibility of ICTs for knowledge management among the sampled libraries was not uniform, even within one country. Infrastructural support had affected some of the university libraries to a great extent. The irregular electricity supply in Nigeria made it extremely difficult for the ICTs to be functional. The knowledge and skills for using ICT for knowledge management was largely adequate, but varied within the libraries and among the librarians as well. The need for re-skilling librarians is significant as it would help to bridge the gap and reduce knowledge loss in the library organisation. Relative to the Nigerian sample, the South African university libraries were better equipped in using ICTs for KM in terms of availability, accessibility, services and effectiveness. Satgoor's (2015) study confirms that university libraries in South Africa are better equipped and funded for information services. It is, however, not unusual to find that most African university libraries are poorly resourced and under-funded (Osagie & Orheruta, 2013:195; Okiy, 2005; Enyia, 2013).

The challenges facing the libraries, as reported in Table 4, were numerous, with inadequate professional staff topping the list. However, irrespective of the challenges faced, libraries had devised strategies for coping and

rendering services. Re-skilling librarians through continuous education with the help of the government is essential. Support through functional policies and funding should enable better integration of ICT with KM in libraries where this has not occurred. Based on the findings, there are sound lessons to be learnt by the university libraries from both countries, and a forum for doing so is urgently needed. This study provides new information from extant literature and data from field research that can be used to develop ICT application for KM university libraries. The improvement of the service will require more investment in modern ICT facilities, education and training/information literacy, a review of library policies and regular evaluation of library performance.

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Access to and Use of Ict's in the Provision of Information to Distance Learners in Kenyan Universities

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Abstract

The purpose of the study which informs this chapter was to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi (UoN) and Kenyatta University (KU) libraries; and to make recommendations for improvement. The study employed a mixed methods research design. Stratified, purposive and census sampling techniques were alternately used to select key participants namely: distance learners, directorate of distance education, deans of schools and chairmen of departments, university librarians and senior library staff. A sample of 200 distance learners and 56 respondents from the other strata was selected. Data was collected through a semi-structured questionnaire administered to distance learners, semi-structured interviews with the other respondents and documentary review. The data was analysed using descriptive statistics. The key findings of the study were that: distance learners had limited access to and use of ICTs; they could not access e-resources from the university library remotely; and they experienced challenges in accessing information through ICTs. Distance learners will benefit from this study from improved access to information through ICTs thereby increasing the quality of their education. This study will also inform university libraries in Kenya in general and the University of Nairobi and Kenyatta University libraries in particular on improving their information services for distance learners through ICTs.

Keywords: *Distance learners, Information Communication Technologies (ICTs), Kenya, library services, university libraries*

Introduction

This chapter discusses access to and use of ICTs in the provision of information to distance learners in two universities in Kenya: University of Nairobi (UON) and Kenyatta University (KU). Distance Education (DE) is becoming popular for accessing higher education due to its flexibility. Distance Education has been described by various terminologies such as university without walls, extramural studies, experimental learning, off-campus education, open learning, extended campus, the external degree, or university extension. According to the Commonwealth of Learning (2015), distance education refers to the delivery of learning to those who are separated mostly by time and space from the teachers mediated by technology for delivery of learning content with possibility of face-to-face interaction for learner-teacher and learner-learner interaction.

Distance education in Kenya started with the admission of 594 students to the University of Nairobi in 1995 (Kavulya, 2004). The mode of instruction was by correspondence and few contact hours when lecturers visited the regional sites. The learning resources used consisted of self-instructional materials in print, video and audio-cassettes. From these humble beginnings, the Correspondence Course Unit rose to become the College of Adult and Distance Education comprising of an Institute of Extra Mural Studies located and co-ordinated at the Kikuyu Campus of the University of Nairobi.

Kenyatta University launched the School of Distance Learning in 2001. The mode of instruction was by correspondence. Self-instructional materials in print, video and audio cassettes were used as learning resources. At specified periods, students would go to the centres for formal lectures and examination (Kavulya, 2004). One of the major recommendations from the 2006 e-readiness survey of higher education in institutions in Kenya by the Kenya Education Network (KENET) was the urgent need for e-learning (KENET, 2007). We are, therefore, likely to see e-learning becoming more and more widespread in Kenyan universities. This will facilitate students and faculty to become more exposed to online information resources. Access to and use of Information Communication Technologies (ICTs) will play a big role in ensuring that distance learners exploit the electronic resources for their study.

The undertaking of ICTs in public university libraries is enormous in the country. In Kenya, training opportunities such as mixed mode of delivery (face-to-face and distance education) have been provided using ICTs such as the Internet, CD-ROMs, computers, video-conferencing, mobile telephones

and electronic communication to enable e-learning. Currently, such learning approaches are in use at the University of Nairobi (UoN) and Kenyatta University (KU).

Distance learning in virtual universities is supported by a comprehensive network of services from academic management system, libraries, student and tutor portals and services as well as other support staff. Libraries promote critical thinking and the ability to conduct independent research among students. This study is based on the premise that ICTs are important in the development of digital or electronic libraries which in turn provide easy access to information resources and services to learners remotely. The basic building blocks of a digital library include automation of library systems, sufficient ICT facilities (computers, networks) and adequate connectivity (Rosenberg, 2005).

Rationale

The increase in distance learners' enrolment in Kenya has led to a change in learning patterns in higher education. This in effect is calling for a paradigm shift in information delivery by university libraries to this category of users. The existing library services in public university libraries in Kenya were originally designed for the on-campus users and are not suited for the needs of distance learners.

Unfortunately, public university libraries in Kenya have not responded to this change by providing information access for distance learners which can be achieved through ICTs. A study by Aseey (2004) found out that access to the University of Nairobi library was a big problem facing distance learners. According to Cooper (2000), less attention has been given to providing information services for the distance programmes during the planning for distance education. Instead the attention has focused on the logistics and methodology of teaching of these programmes only.

Although public university libraries in Kenya are adopting the use of ICTs in information services delivery, distance learners are disadvantaged because of limited access to and use of ICTs occasioned by scarcity and limited range of ICTs, level of e-readiness for distance learners and absence of or unsuitable policies for distance learning. Distance learners need to access relevant and up-to-date research information in order to achieve superior academic skills in their studies. Lack of systems that can provide distance learners with access to information negatively impacts on their studies. The

Association of College and Research Libraries (ACRL) guidelines state that distance learners are entitled to the same library services and resources as the regular students on campus (ACRL, 2008). The important role of libraries in supporting distance education in Kenya is emphasised by the Commission for University Education – CUE (2012). The CUE standards on distance learning library services state that a university shall provide adequate resources to support open and distance learning library services.

Purpose

The purpose of the study which informs this chapter was to investigate access to and use of ICTs in the provision of information to distance learners at the University of Nairobi and Kenyatta University libraries and to make recommendations for improvement. This chapter investigates the range of ICTs at the selected universities and to explore the level of e-readiness of the libraries for distance learners.

Review of Literature

The study, informing this chapter, was guided by the Diffusion of Innovation (DoI) Theory complemented by the Constructivism Learning Theory. The DOI Theory, attributed to Everett Rogers, states that diffusion is the process by which an innovation is communicated through certain channels over time among members of a social system (Rogers, 1995). The theory is used as a basis to explain the process of adoption of ICTs at the two universities. The theory has been used by other scholars as the theoretical basis for information projects (Minishi-Majanja & Ochola, 2004; Minishi-Majanja & Kiplanga't, 2005).

The Constructivism Learning Theory, attributed to Jean Piaget (Liu & Matthews, 2005), views learning as the result of mental construction by learners through interaction with their environment. The emphasis is on the learner rather than the teacher. The theory is found appropriate in this study because the trainer is distant from the learner and acts only as a facilitator.

Various user studies on the needs and expectations of distance learners internationally established that distance learners' information needs were not being adequately met (Moyo & Cahoy, 2003; Mabawonku, 2004; Boadi & Letsolo, 2004; Maclean & Dew, 2008). Previous studies in Kenya established that the libraries were not providing adequate services to distance learners (Kavulya, 2004; Wachira & Onyancha, 2012).

A study by Rosenberg (2005) found that the number of public university libraries in English-speaking African countries that could make effective use of e-resources was small due to inadequate ICT infrastructure. In their study on internet adoption in Kenyan university libraries, Odero-Musakali and Mutula (2007) found that while most of Kenyan university libraries had access to the Internet, very few appeared to have integrated the technology into their routine operations. Similarly, the e-readiness survey of Kenya Education Network – KENET (2007) revealed that off-campus access to library resources by users was limited. Although the UoN and KU libraries have web-based OPAC and provide access to electronic resources, it is not clear how distance learners benefit from the e-resources. The result is that students and researchers frequently use Google and in so doing miss out the vetted and relevant information resources provided by the library which can be delivered in real-time. Murray (2003:146) opines that “if the academic library profession is to avoid becoming sidelined by Google-type search engines and commercial database services, then they must offer a web presence that delivers relevant, quality, approved and personalised access to resources and library services – irrespective of format and location”.

Inadequate information literacy skills have been identified as an impediment to distance learners in the search for information (Kavulya, 2004; Akande, 2011). Libraries have commonly provided training and support to students through mechanisms like bibliographic instruction, workshops and on an individual basis as needed most of which happens on-site. With distance education and the electronic library environment, the mode of training should be electronic asynchronous training through computer-based tutorials. Distance learners need information literacy skills in order to identify and obtain relevant information for study and lifelong learning. Information literacy trainings have been conducted by the University of Nairobi library especially for the Kenya Libraries and Information Services Consortium (KLISC) members. However, it is not clear how these literacy programmes benefit the distance learner.

Methodology

A multiple case study approach was adopted based on two case organisations, the UoN and KU. The case study was found suitable because it allowed for in-depth investigation into the selected cases (Kothari, 2004). The selection of the two cases was based on the amount and quality of information they were expected to generate about the research problem. They had well established distance education programmes among public universities in Kenya. In addition, their libraries had adopted the application of ICTs.

Earlier related empirical studies carried out in Kenya were based on interviews with librarians only. This study on the other hand employed a mixed method research design with a combination of both quantitative and qualitative data collection techniques. The epistemological stance on mixed methods approach is one in which the researcher tends to base knowledge claims on pragmatic grounds (Creswell, 2003). The triangulation of methods helped to best understand the research problem as well as provide a convergence of results (Cresswell, 2003; Neuman, 2006).

Stratified sampling technique was first applied to the target population to come up with six strata of the population at each case study namely: distance learners, Directorate of Distance Education, Deans of Schools and Chairmen of Departments, ICT Directorate, University librarians and senior library staff. Purposive sampling technique was employed for selecting key informants from distance students, Deans of Schools and Chairmen of Departments and senior library staff while census was used for the Directorates of Distance Education, ICT Directors and University Librarians. A sample of 200 Distant Learners and 56 respondents from the other strata was selected. The sample comprised 100 Distance Learners from each case; five Directors from the UoN and three from KU were selected from the Directorates of Distance Education. Another 12 members from each case were picked from the category of Deans and Chairmen of Departments. A selection of one ICT Director from each case, one University Librarian from each and another 10 senior library staff (senior librarians and librarians) from each case. This kind of categorization ensured that the sample was as diverse as possible, representative, accessible and knowledgeable. Table 1 and Table 2 below show the sample size and the response rate respectively.

Table 1: Sample Size

Category of Respondents	UoN	KU	TOTAL
Distance Students (postgraduates and undergraduates)	100	100	200
Directorate of Distance Education	5	3	8
Deans and Chairmen of Departments	12	12	24
ICT Directors	1	1	2
University Librarians	1	1	2
Senior Library Staff (Senior Librarians and Librarians)	10	10	20
Total	129	127	256

Source: Research data

Table 2: Response Rate

Category of Respondents	UoN		KU	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Distance Students (postgraduates and undergraduates)	74	74	61	61
Directorate of Distance Education	5	100	3	100
Deans and Chairmen of Departments	8	66.7	8	66.7
ICT Directors	1	100	1	100
University Librarians	1	100	1	100
Senior Library Staff (Senior Librarians and Librarians)	8	80	8	80

Source: Research data

Primary data which were quantitative in nature were collected through a semi structured questionnaire administered to distance learners. A section of the questionnaire was open ended providing an opportunity for distance students to provide additional information. Qualitative data was collected through face-to-face interviews conducted with the other respondents namely; the Directorate of Distance Education; Deans of Schools and Chairmen of Departments; ICT Directorate; University librarians and senior library staff

respectively. An interview guide was used to lead the researcher in the interviews. Secondary data was collected through documentary review. Quantitative data collected was analyzed using descriptive statistics and qualitative data was analyzed thematically.

Findings and Discussions

The study revealed many similarities and a few differences between the two case study organizations. Not all respondents answered every question resulting in the differences in total numbers in some cases. The findings are presented below.

Age and Gender Influence on Access to and of Use of ICTs by Distance Students

Age was found to have an influence on the access and use of ICTs in both case organizations. The main users of ICTs among distance students in both cases were generally the younger students. Findings indicate that the predominant age group using computers was between 31-35 years of age at the UoN and between 26-30 years at KU. These findings are consistent with the findings of other scholars who established that users of computer and internet were in the age group of 18-34 years (Akande, 2011; Ndung'u et. al. 2012). Figure 1 and Figure 2 below show age distribution in access to and use of computer by distance students from the UoN and KU respectively.

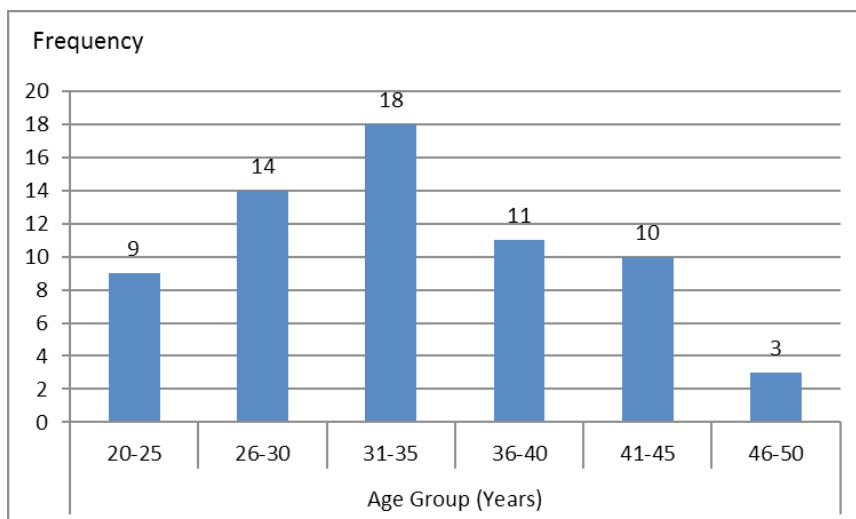


Figure 1: Age Distribution and Access to and Use of Computer at the University of Nairobi

Source: Research data

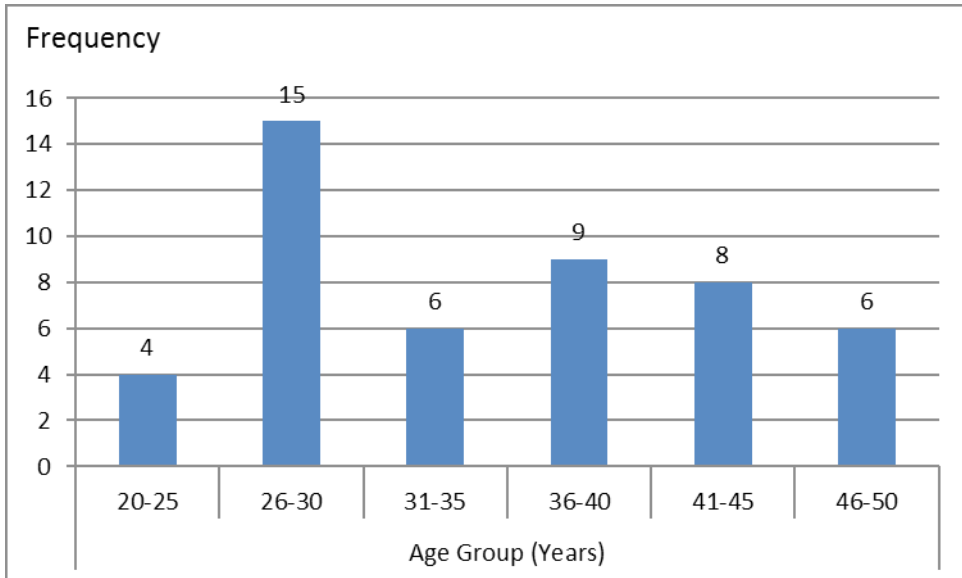


Figure 2: Age Distribution and Access to and Use of Computer at Kenyatta University

Source: Research data

On the other hand, gender was not found to influence the access and use of ICTs. At the UoN, 42 out of 48 (87.5%) of male students and 23 out of 26 (88%) of female students had access to a computer. At KU, 31 out of 42 (73.8%) of male students and 17 out of 19 (89.5%) of female students had access to a computer. Therefore, there is no apparent association between gender and use of ICTs at both case organizations. This can be attributed to the fact that both male and female students exhibited similar education and socio-economic status hence equal opportunities. These findings concur with findings of other studies that argue that gender alone does not influence use of ICTs. Other factors like education and socio-economic status influence the usage patterns among females and are the main cause of low usage where female users are concerned (Oyelaran-Oyeyinka and Adeya, 2004; KENET, 2008; Lera-Lopez *et. al.*, 2011; Ndung'u *et. al.*, 2012).

Extent of Use of ICT Infrastructure by Distance Learners

The first objective was to investigate the range of ICTs used by the selected universities. The findings are discussed below.

Findings from interviews with staff indicate that the two case organisations had similar ICT infrastructure. This was in the form of networked desktop computers found in offices, computer labs, the library, students' cyber cafés, fiber optic Internet connection, wireless Internet (WiFi), laptops for deans, chairmen of departments and directors, personal mobile phones. Some study centres were also on fiber link. The libraries in both universities had also automated the library system on integrated library management system and had developed library websites. However, the study revealed that KU had more computers than the UoN. At KU, some members of faculty namely deans, chairmen of departments and directors, had been provided with laptops by the university as opposed to the UoN. Additionally, KU had a higher PC to students' ratio (5 PCs per 100 students) than the UoN which had three PCs per 100 students.

However, the number of computers in both case study organisations was still insufficient as it fell below the recommended 10 PCs per 100 students. The findings concur with the findings of KENET (2008) e-readiness survey which established that for all 48 African universities surveyed, the PC ratios were all below the recommended average ratio of 10 PCs per 100 students. The study findings showed that the ICTs in universities were not being utilised to support distance students. Furthermore, the regional centres at both institutions lacked proper ICT facilities and infrastructure such as electricity supply and telecommunications. This was corroborated by findings from distance students as discussed below.

Location of Computers Used by Distance Students

The study established that 65 (87.8%) of the respondents from the University of Nairobi and 48 (78.7%) from Kenyatta University had access to a computer. However, not all the respondents owned a computer as shown in the following section.

From the UoN, 43 (58.1%) of respondents accessed and used computers from a commercial cyber café, 18 (24.3%) from a personal laptop and 16 (21.6%) from the work place. From KU, 35 (57.4%) accessed and used computers from the work place, 22 (36.1%) from a commercial cyber café, 21 (34.4%) from the university library and 17 (27.9%) had personal laptops. The findings reveal that the majority of distance students used computers from outside the university library and the study centre as shown in Table 3 and Table 4. This is because distance students could only access the ICTs provided by the university library during residential sessions but even then, the timetable was so rigid that they rarely found time to use the computers provided. This

finding is consistent with the findings of Nwezeh (2010) on libraries and distance education in Nigeria. The findings indicate that 82.4% respondents had never used the Internet inside the library even if the facility was there. Table 3 and Table 4 below show the location of computers used by distance students from the UoN and KU respectively.

Table 3: Location and Use of Computers by Distance Students at the University of Nairobi (n=74)

Location	Frequency	Percentage (%)
Commercial Cyber café	43	58.1
Personal laptop	18	24.3
Work Place	16	21.6
Home	13	17.6
University Library	10	13.5
Cyber café Within the University	9	12.2
No Access to a Computer	9	12.2
Study Centre	0	0

(Multiple Responses)

Table 4: Location and Use of Computers by Distance Students at Kenyatta University (n=61)

Location	Frequency	Percentage (%)
Work place	35	57.4
Commercial Cyber café	22	36.1
University Library	21	34.4
Personal laptop	17	27.9
Cyber café Within the University	16	26.2
Home	14	23.0
Study Centre	9	14.8
No Access to a Computer	6	9.8

(Multiple Responses)

Use of Mobile Phones

On students' access to mobile phones, the study revealed similar findings in both case study organisations. At least 65 (87.8%) of the students from the UoN and 48 (78.7%) from KU had a mobile phone. However, the findings show that distance students in both institutions did not use mobile phones for accessing information services. For example, 73 (98.6%) students from the UoN and 46 (75.4%) from KU had not used a mobile phone to get information services from the university library.

E-readiness of University Libraries for Distance Learning

E-readiness is the preparedness of university libraries to use ICTs to enhance information access to distance learners thereby increasing the quality of learning, teaching and research. The key indicators of e-readiness of the university libraries considered were the ICT infrastructure, electronic communication system, electronic services, and information literacy. In addition, other factors such as budget and staffing for distance students were also considered as important. The ICT infrastructure has been discussed in the foregoing section. Inadequate ICT infrastructure indicates a low level of e-readiness in both the UoN and KU. The other factors are discussed below.

Electronic Communication with Distance Students

The findings indicate that 71 (96%) of the respondents from the University of Nairobi and 37 (60.6%) from Kenyatta University had not used e-mail to get information services from the university library. Similarly, 73 (98.6%) from the University of Nairobi and 46 (75.4%) from Kenyatta University had not used mobile phones to get information services from the university library. These findings were corroborated by interviews with the university librarians and senior library staff. Librarians from both university libraries revealed that they rarely used electronic communication with distance learners. Lack of e-communication from the libraries points to a lack of e-readiness for distance students. These findings are consistent with the findings of Akinseinde and Adomi (2004) on email usage by technical education students in Nigerian universities who found that students used email mainly to communicate with relatives, friends and course mates. Similarly, a study by Parsons (2010) established that distance learners used mobile phones mainly for communication with friends but very few students used them for educational purposes.

Electronic Services

Senior library staff interviewed from both universities revealed that there were no dedicated services for distance students. According to senior library staff from the UoN, no conscious effort was made to provide current awareness services to distance students. Kenyatta University senior library staff, however, said that the library provides current awareness via the electronic notice board and RSS feeds on OPAC on the library website. On the other hand, responses from distance students from both universities indicated that the majority were not really aware of the e-services offered by the university library apart from the OPAC. Lack of electronic services is yet another pointer to inadequate e-readiness of the case libraries.

On document delivery, the study found that the UoN library was not offering document delivery service to distance students as 70 (94.6%) of the respondents had never used this service. On the other hand, KU library was offering the service to some extent - 30 (49.2%) had used the service. This concurs with the finding by Wachira and Onyancha (2012) that document deliveries through email attachments were common at Kenyatta University. However, they were quick to add that all respondents from both universities said that users were encouraged to collect materials from the library in person. This shows a general lack of e-readiness in the provision of services by the university libraries.

Electronic Resources

The study revealed a gap in access to and use of e-resources by distance students in both case institutions. The findings indicate that 40 (54%) from the UoN and 22 (36.1%) from KU did not use the e-resources. Similarly, no respondents from the UoN used the e-resources fully (100%) and only an insignificant proportion of two (1.6%) who did so were from Kenyatta University. Figure 3 and Figure 4 show the extent of use of e-resources at the UoN and KU respectively.

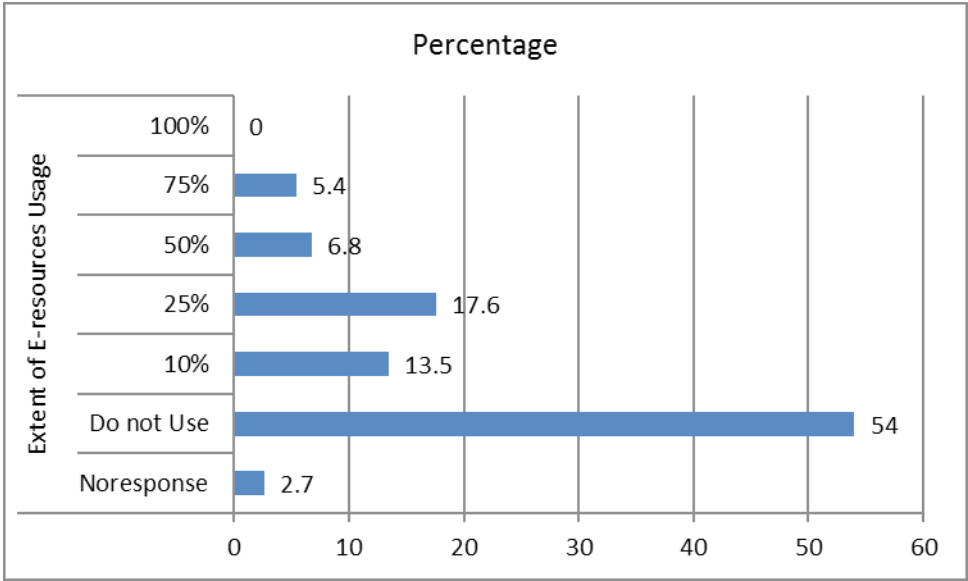


Figure 3: Extent of Use of e-resources at the University of Nairobi

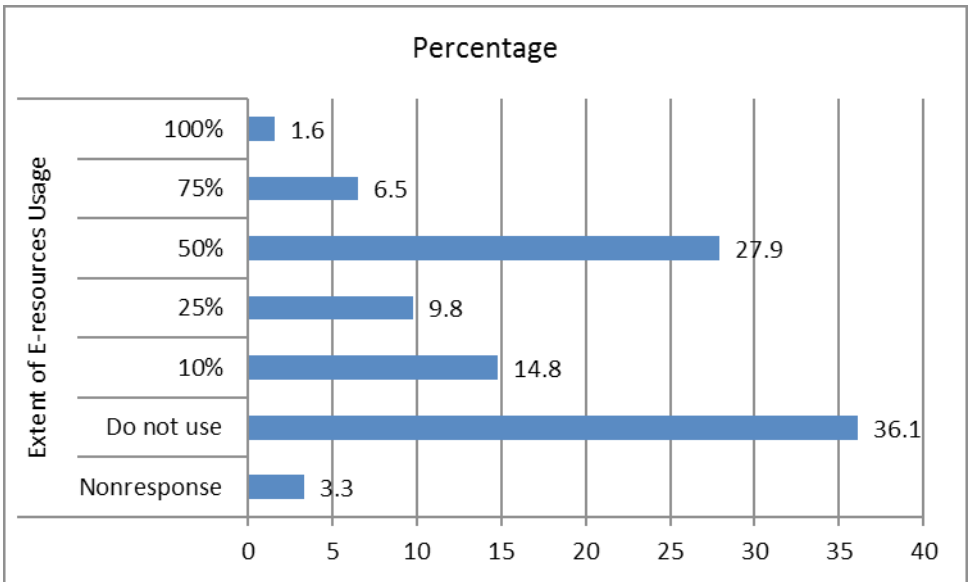


Figure 4: Extent of Use of e-resources at Kenyatta University

Source: Research data

The findings also indicate that a significant proportion of respondents in each case accessed the university library's e-resources by physically visiting the library. For example, 30 (41.1%) of students from the UoN and 29 (47%) from KU indicated that they accessed e-resources physically from the libraries. Remote access was insignificant. The study also revealed that 33 (44.6%) students from the UoN and 10 (16.4%) from KU had no access to e-resources at all. The study therefore established that access to library e-resources by distance students was limited in both UoN and KU. Table 5 and Table 6 show how distance students access library e-resources at the UoN and KU respectively.

Table 5: Access to Library E-resources by Distance Students at the University of Nairobi (n=74)

How Students Access E-resources	Frequency	Percentage (%)
Physically visiting the library	30	41.1
Remotely from a commercial cyber café	9	12.2
Remotely from home	4	5.4
Remotely from outside the library but within the university campus	3	4.1
Remotely from my workplace	3	4.1
Remotely from my study centre	0	0
Other	0	0
None of the above (No access)	33	44.6
No response	1	1.4

(Multiple Responses)

Table 6: Access to Library E-resources by Distance Students at Kenyatta University (n=56)

How Students Access E-resources	Frequency	Percentage (%)
Physically visiting the library	29	47.4
Remotely from a commercial cyber café	12	19.7
Remotely from my workplace	12	19.7
Remotely from my study centre	8	13.1
Remotely from outside the library but within the university campus	7	11.5
Remotely from home	4	6.6
Other	1	1.6
None of the above. I have no access	10	16.4
No response	5	8.2

(Multiple Responses)

The study revealed that the main services that distance students at the UoN used were books/journals consulted in the library. These were used three times a year by 47 (63.5%) of the respondents and physical book loans/journals used by 46 (62.2%). Similar responses were elicited from distance students at KU where a total of 37 (60.6%) used books/journals in the library and 27 (44.3%) physical book loans/journals. The majority of respondents indicated that they mainly used the study modules/units; other students used Google as an alternative source of information.

The study (from interviews with the librarians) established that the mode of access to e-resources was by IP addresses and username and password for some resources. Distance students could not have full text access to some e-resources remotely due to unavailability of remote access. There was a gap in distance students' access to the e-resources provided by the university libraries in both institutions. This is consistent with the findings by Wachira and Onyancha (2012) that established that access to e-resources by remote users from the UoN and KU was via IPs and passwords and users could access the university library from the campuses that were interconnected with a proxy server. This explains the general lack of use of e-resources by distance students and their dependence on the study modules/units and Google. The findings concur with those of Boadi and Letsolo (2004) that

the distance students' sources of information were colleagues, personal collections, co-workers and family members as they were unable to access on-campus library and information sources and services.

Information Literacy Skills of Distance Learners

The finding from the librarians was that both university libraries did not have an information literacy programme for distance students. This finding corroborates the findings from distance students that the majority of them from each case were not very proficient in online searching and that they learnt information searching skills mainly from friends or through self training. This finding is also consistent with findings of other scholars (Abdelrahman, 2012; Mabawonku, 2004). It explains why distance students mainly use the study modules/units, while others use Google as their sources of information.

Library ICT Policy for Distance Learners

Policies are important in giving guidelines on how services to distance learners should be provided. The findings indicate that there was a lack of a library ICT policy for distance learners in both case organizations. The findings concur with those of Kavulya (2004) whose findings indicated that there was a lack of institutional policies to guide the provision of information for distance learners in university libraries in Kenya. Similarly, Wachira and Onyancha (2012) found that the selected university libraries did not have policies for remote users.

Challenges Experienced By Distance Students in Accessing Information through ICTs

Poor planning of distance education programmes in both the University of Nairobi and Kenyatta University was identified as a major issue that contributed to problems encountered by distance learners. It emerged from interviews with the librarians that the library was excluded during the initial planning stages for distance education programme. The respondents also identified several challenges that distance learners experience in accessing information through ICTs. These included: lack of access to computers; high cost of accessing information through ICTs; poor Internet connectivity in rural areas; inadequate electricity in rural areas; inadequate library services at regional centres; inadequate computer skills and information literacy skills; lack of awareness of the online resources and services offered by the university library; poor communication between the university library and distance students; lack of remote access to e-resources and inadequate services at study centres. These findings from the respondents concur with those identified by various scholars in reviewed literature (Abdelrahman, 2012; Akande, 2011; Oladokun & Aina, 2011).

Conclusion

The increase in enrolment of distance learners in Kenya is calling for a paradigm shift in the provision of library services to this category of users. This can be achieved through the use of ICTs. There is need to improve both the national and the universities' ICT infrastructure to facilitate access by distance learners. Distance learners should also be facilitated to acquire suitable ICTs for accessing information. Distance students are separated from the university library by geographical locations. Provision of e-services such as book reservation, online loan renewal, online reference service, online information delivery, current awareness services and access to e-resources would address this challenge and ensure that distance students get same services from the university libraries as their full-time colleagues. This shift requires proper planning for distance students by university libraries. Adequate budget allocation to both the University of Nairobi and Kenyatta University libraries would facilitate the provision of ICT-based services and resources suitable for distance learners.

Recommendations

On the basis of the study findings, the following recommendations were made to enhance access to and use of ICTs in the provision of information to distance learners.

Involvement of Stakeholders in Planning for Distance Education

This study recommends that university management should involve the university library right from the start of planning for the distance education programmes. There should be close collaboration between the faculty, directorate of distance education, ICT staff and librarians in order to create a successful academic environment for a distance learner.

Distance Learners' Needs Assessment

Librarians should conduct needs assessment studies on distance learners in order to establish their information and communication needs. This will help librarians to develop a model of services that addresses the information needs of distance learners.

Formulation of ICT Policies

University libraries should have policies governing library services for distance learners. These should include guidelines on access to services and resources through ICTs, financial resources, staffing and physical facilities.

Provision and Improvement of the National ICT Infrastructure

The Government of Kenya, specifically the Communications Authority of Kenya (CAK) should improve the telecommunications infrastructure in the rural areas with a view to lowering Internet costs. The government should also zero-rate taxation on computers and other ICTs including mobile phones so that they can be more affordable to majority of its citizens.

Provision and Improvement of University ICT Infrastructure

There is need to improve the ICT infrastructure within universities including university libraries to ensure e-readiness for distance students. In addition, distance students should be facilitated to own laptops or tablets. This can be achieved through universities lobbying with the government for free laptops for students. If this is not possible, the university management should partner with possible sponsors such as banks and arrange for an affordable loan facility for distance students to acquire laptops.

Provision and Improvement of ICT Infrastructure at the Study Centres

The directorate of ICT should ensure that all regional centres have adequate computers and internet including WiFi. They should also ensure that the centres are linked to the main university electronically via a fiber link. The central library system should be networked with regional centres electronically to enable distance learners to access the electronic library from the regional centres. Each regional centre library should have a secure multimedia lab to be used for online searches by distance learners.

Use of Internet Enabled Mobile Phones by Distance Learners

Distance learners should be encouraged to have Internet-enabled mobile phones. This is advantageous because a mobile phone is relatively flexible in communication. If the taxation of mobile phones is reduced, then they will be more affordable.

Development of Library Portals

In order to be e-ready for distance students, university libraries should develop library portals that enable remote access. The information resources that should be posted to the library portal should include: e-books, e-journals, e-references and bibliographic databases. The e-services should include the web-OPAC, virtual reference, circulation, document delivery, online current awareness and online literacy programmes. Seamless remote access to the full-text of licensed e-resources should be enabled for instance, by installing EZProxy software. Instructions about authentication should be posted on

the university library portal. In addition, librarians should also develop an interface for a federated search for the e-resources. This would minimize the time spent having to logon to different publishers' sites.

Allocation of Adequate Resources for Distance Learners

In order to provide the ICT facilities, e-resources and services, budgetary allocation must be provided. The university management should ensure that the university library is allocated adequate budget which at the time of this research was proposed not to be below 20% of total institutional budget as stipulated by the Commission for University Education.

Provision of Library Services at the Study Centres

University librarians should expand the library to the centres and ensure that adequate information resources are provided and the full range of library services are offered at the centres.

Partnerships with Other Libraries

University libraries should partner with other libraries including the Kenya National Library Service (KNLS) to enable distance learners to use the facilities and resources of the libraries nearest to them.

Practical Implications

Distance learners will benefit from this study from improved access to information through ICTs thereby increasing the quality of their education. This study will inform university libraries in Kenya in general and the University of Nairobi and Kenyatta University libraries in particular on improving their information services for distance learners through ICTs. The findings of this study will also benefit the university management and the Kenya government in planning and management of ICTs for distance education.

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Use of ICTs in the Provision of Information and Services in Academic Libraries to Enhance Learning: A Case Of The Technical University of Kenya Library

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Abstract

Traditional provision of information and services in academic libraries has been replaced by the use of ICTs. This change has been necessitated by the changing needs and characteristics of users. Academic libraries being partners of faculty have an obligation to enhance learning, especially e-learning, through the use of ICT-based resources and services. Despite the utilization of large financial resources annually in the acquisition of ICTs to enable e-resource access there is low usage of the available e-resources and databases at The Technical University of Kenya. The objective of this chapter is to examine the use of ICT-based resources and services at The Technical University of Kenya Library. The chapter is informed by a research study that was conducted on the same theme. The target population for the study consisted of students who were library users and teaching staff. Stratified random sampling technique facilitated the choice of 150 students and 50 teaching staff from whom data relevant to the study were collected using structured questionnaires. The study established that although users appreciated the use of ICT-based resources and services, usage was low due to many challenges which were hindrances to their effective use. The author concludes that poor ICT infrastructure in the library has contributed to the underutilisation of the available e-resources and services. Low usage of e-resources which contain the most up-to-date information may result in users relying on print ICT-based materials, hence denying themselves knowledge on how to search and use ICT-based information to enhance their teaching and learning. The author recommends that the library's budget be increased, appropriate information literacy curriculum be designed and implemented to train users how to access and use e-resources. This chapter may be used to inform academic libraries and university management of the factors which cause low usage of e-resources and how to remedy the situation.

Keywords: *Academic libraries, electronic resources, ICT-based resources, ICT Infrastructure, information literacy*

Introduction

Academic libraries in Kenya today can no longer afford to continue with the traditional information and services provision methods if they have to remain relevant in the current academic arena. The users have changed and their ways of searching for information have also changed and there is greater demand for remote and online access (Thachill, 2008). Libraries exist in a competitive environment of information production and access. As service providers, academic libraries have to cater for the diverse and evolving needs of faculty and students. The libraries therefore have to position themselves to ensure accessibility to a wide range of e-content by acquiring access to important databases and digital collections.

The use of ICTs in academic libraries has changed the information provision scenario tremendously. Although university libraries have incorporated ICTs in their management of resources, there is need for them to lay strategies to ensure that they remain viable sources of information as pointed out by Kavulya (2004). This point is further advanced by the fact that the use of ICTs in academic libraries has changed how information is stored and retrieved making the process of cataloguing, circulation and management of statistics to improve greatly as argued by Nebeolise, (2013). The days when libraries were the first stop for users is gone. Today libraries have to deal with users who wonder why they need to go to the library when they can find the information they need from the Internet using their personal computers in their classrooms, offices and even the comfort of their houses. This is an indicator that ICTs facilitate learning for both on-campus and distance learners due to the ease of access to the e-resources they may require. It is against this background that the study that this chapter is derived from was carried out in order to establish how the use of electronic resources and databases at The Technical University of Kenya (TUK) library can enhance teaching and learning.

TUK library is a successor of the Kenya Polytechnic library which came into being after the university was awarded the Charter on 15th January 2013. The library has not changed its physical set-up since it was established in 1961 when the total number of students in the institution was less than 500 against today's student population of over 14,000. It still remains the two-floored building with a sitting capacity of 250 users. However, the quality of the services and resources have changed tremendously since 2010 when the institution gained the status of a university college in order to cater for the evolving needs of the faculty and students. The library started integrating

modern ICT in its services and information in 2010 when it converted its classification system from Dewey Decimal Classification Scheme (DDC) to Library of Congress (LC) in order to exploit the services of online systems such as Online Computer Library Centre (OCLC) and Worldcat. It also migrated from the manual cataloguing system to KOHA which allowed the library to establish OPAC. This was the first use of ICT to provide services to the TUK community.

The introduction of OPAC, which is web-based, ensured that library users no longer had to use the manual catalogue which was not only tedious but was also loathed by many users. The users can now search the OPAC wherever they are 24/7. The library has fully integrated ICTs in cataloguing and circulation processes since 2011. The library database is hosted on a server in the ICT department; users are registered online. Users can reserve and renew books online. The charging and discharging of materials is fully online after the integrated library system was implemented. The "Ask a Librarian" portal in the library website is a platform for interactive discussions between the users and library staff. The use of ICTs has also facilitated the library to be the first and only unit at the university to put in place a biometric entrance management control system.

The primary function of the library is to support the teaching, learning and research. Therefore, it strives to acquire relevant information in various formats to satisfy the educational needs of the university clientele. TUK library has an institutional repository to manage the research output of the university. Through the Kenya Library and Information Services Consortium (KLISC) the library subscribes to e-journals/databases and e-books in order to enhance the teaching and learning process at the university and also to ensure that the users have access to the available e-resources.

The e-resources and databases available at the TUK library include: Harvard Business Review; AJOL; ALUKA; American Physical Society; Annual Reviews; Cambridge Journals Online; EBSCOhost; Edinburg University Press; Emerald Publishing Group Limited; Institute of Electrical and Electronics Engineers; Institute of Physics Publishing; JSTOR; Optical Society of America; Oxford University Press; Oxford Journals; Project Muse; SAGE journals online; Springer; Symposium; The Cochrane Library; University of Chicago Press; Wiley-Blackwell; [HSS & STM] World Bank Online Resources; World Data Bank; American Institute of Physics journals; Gale; Expanded Academic and Health and Wellness Resource Centre; Geological Society;- The Lyell Collection; OARE; IOP Publishing;- IOP science; Liebert Online; Nature

Publishing; Palgrave Macmillan; OSA Journals; University of California Press; De Gruyter Journals; Royal Society of Chemistry;- RSC Journals HST - The Biomedical and Life Sciences Collection; HINARI (TU-Kenya Library, 2011).

To ensure that the e-resources are accessed effectively, the library has put the following measures in place; having a comprehensive list of the available e-journals/databases and e-books in the library website; providing guidelines on how to access and search the e-resources are given on the library website; orientation of new students; providing information literacy training; conducting an e-resources week once a year to create awareness and market the the library; having a programme for student knowledge ambassadors who market and train other students on the use of e-resources. They therefore, act as a link between the library and the students.

Statement of the Problem

Although the use of e-resources enhances teaching and learning, faculty and students fail to use e-resources in regular teaching and learning which has resulted in low usage despite the availability of a vast collection of e-resources and databases subscribed through Kenya Library and Information Services Consortium (KLISC). There has not been a guaranteed and effective use of the information resources contained within the TUK library to the satisfaction of user needs.

Objectives of the Study

The study was guided by the following objectives:

1. To examine the use of ICT-based resources and services at TUK library;
2. To find out if the use of e-resources has enhanced teaching, learning and research at TUK; and
3. To establish the challenges encountered by the users in the access and use of the e-resources at TUK.

Literature Review

New information and communications technologies, as well as new educational models, require librarians to re-evaluate the way they develop, manage and deliver resources and services (Ball, 2016). The academic library as an integral part of the university is affected by the changes in the academy

itself, especially the new learning approaches (Virkus & Metsar, 2004). This calls for libraries to focus on services to support these new teaching approaches especially through ICT-based resources. However, Virkus & Metsar (2004) continue to emphasise that the major problem is that faculties do not usually appreciate the role of the library as an active partner in the teaching and learning process. This is an issue that can be seen across many universities in Kenya especially those implementing e-learning where there is a lack of connection between teaching and learning process and access to resources because libraries are not involved in the design of the programmes.

In order for e-learning to be successful in universities in Kenya, it would be important to rethink the strategies to be put in place. KENET study on use of the Internet in academic institutions in Kenya showed low use. The study concluded that although the university community in Kenya is ready to use ICTs for learning, teaching, research and management, the institutional leadership had not recognised ICTs as a strategic priority for transforming these activities. This has resulted in institutions allocating low operational budgets to ICTs, not investing adequately in campus networks, and not having strategies for building the capacity of faculty to use ICTs effectively to support their teaching and research activities (KENET, 2015).

The utilisation of innovative technologies by academic libraries to provide access to resources and services in support of learning, teaching, and research has benefited both students and faculties so that they can undertake learning and research without being in the library. An e-learning environment can provide the academic community with a seamless access to knowledge, course content, information resources and services, all from integrated service point (Johnson, Trabelsi & Tin, 2004).

The integration of ICTs in libraries needs to be appreciated because it makes students view the library as an extension of the classroom and as a learning laboratory where they use subscribed databases and other ICT-based resources (Freeman, 2007). This makes the library to become an important facilitator in collaborative and interactive learning since students can access and explore e-content to prepare for assignments or projects as a group. The library therefore needs to put in place strategies to train the users on how to access and use information hence the need for a comprehensive information literacy programme. The teaching and learning environment has been largely transformed necessitating the need for libraries to evolve in order to fulfil their integral role within universities and be able to deal with the challenges of new technologies in the provision of digital information (ACRL, 2006).

Methodology

This study used a descriptive survey method. Stratified random sampling technique facilitated the choice of 150 students and 50 teaching staff drawn from various schools within the three faculties of university. Structured questionnaires were administered to the 150 students and 50 staff. A total of 129 questionnaires from students and 40 from teaching staff were returned giving a response rate of 86% and 80% respectively. The data generated from the study was analysed and presented through the use of tables and graphs.

Results And Discussion Of Findings

This section presents the results and discusses the findings from the questionnaires. As reported earlier, a total of 129 students and 40 members of teaching staff responded to the survey. Not all the respondents answered every question which may result in differences in the totals in the tables and figures.

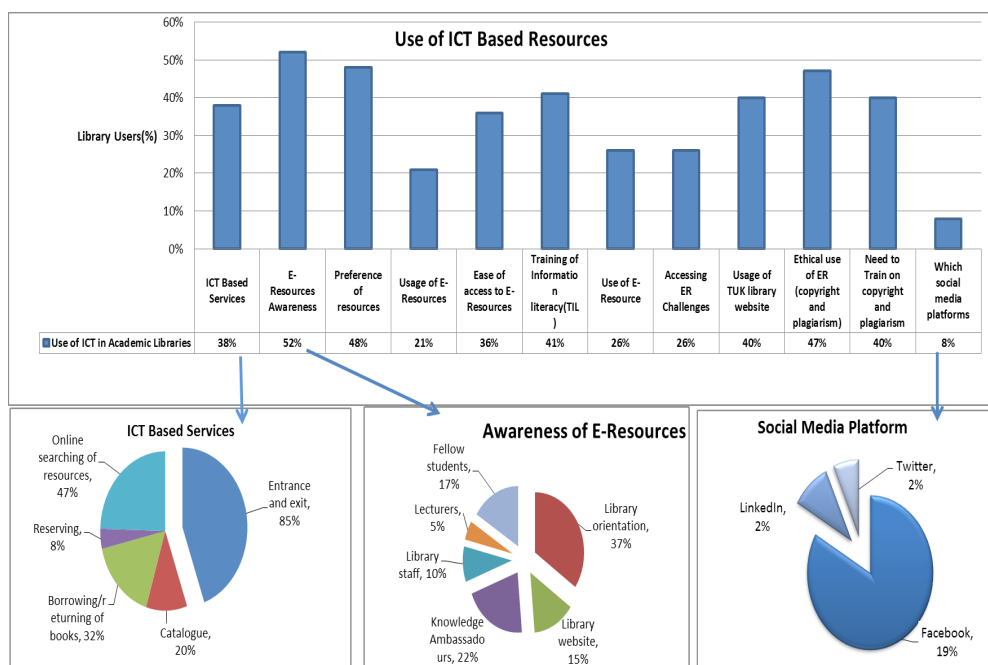


Figure 1: Use of ICT-based resources at TUK

Figure 1 shows the use of ICTs in the provision of information and services in the TUK library. On the awareness of ICT-based services, 85% were aware of the entrance management, 47% were aware of online searching of resources, 32% were aware of online circulation, only 20% were aware of the OPAC while only 8% knew about online reservation of resources. 52% of the respondents are aware of electronic resources available in the library, 47% are also aware of ethical use of e-resources. The ones who did not know about the ethical use of information indicated they would want to be trained. On how the respondents gained information about e-resources, 37% of the respondents knew about the e-resources through the library orientation; 22% through the knowledge ambassadors; 17% through fellow students; 15% through the library website; 10% through library staff and only 5% through lecturers. This indicates that faculties have not been active in creating awareness of e-resources available to the students. This indicates that use of ICTs in the TUK Library in provision of information and services to enhance learning is just average.

It was expected that many students would use the social media platforms available in the library. However, only 8% of the respondents used social media platforms to access TUK information despite the library having Facebook, Twitter and LinkedIn accounts. Facebook was the preferred social media platform being used by 19% of the respondents.

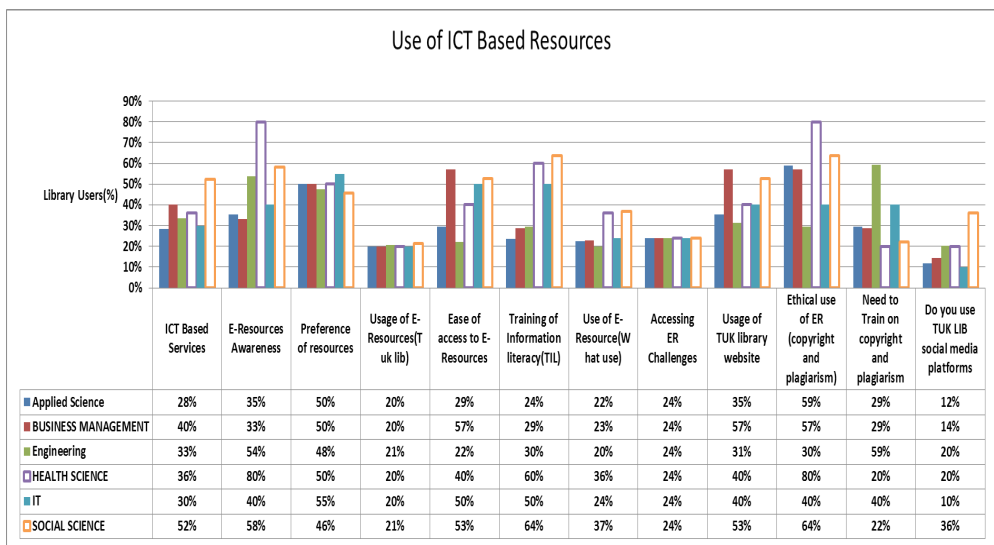


Figure 2: Use of ICT-Based Resources

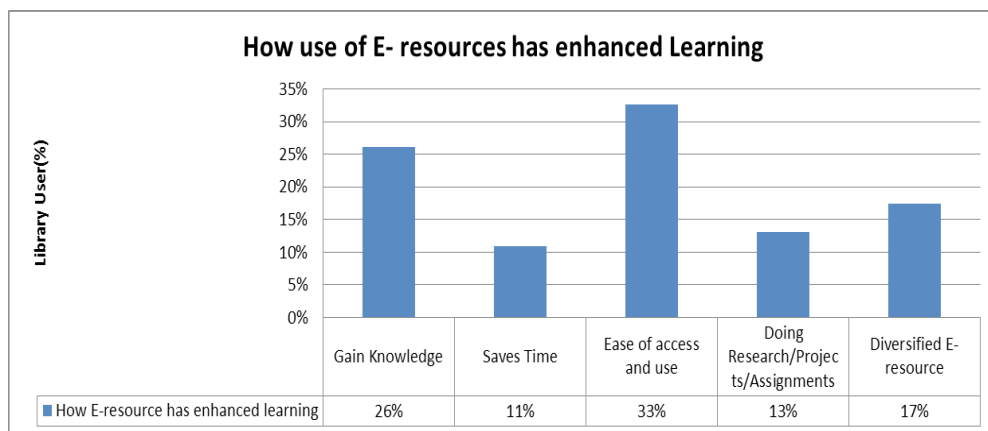


Figure 3: How the Use of E-resources has Enhanced Learning

Figure 3 above shows that ease of access at 33% has influenced learning; gaining knowledge in respective disciplines at 26%; diversity of the e-resources at 17%; assistance in carrying out research, projects and doing assignments at 13% and only 11% to save time. This is an indicator that integration of ICTs-based information resources has not had a great impact on the teaching and learning at TUK.

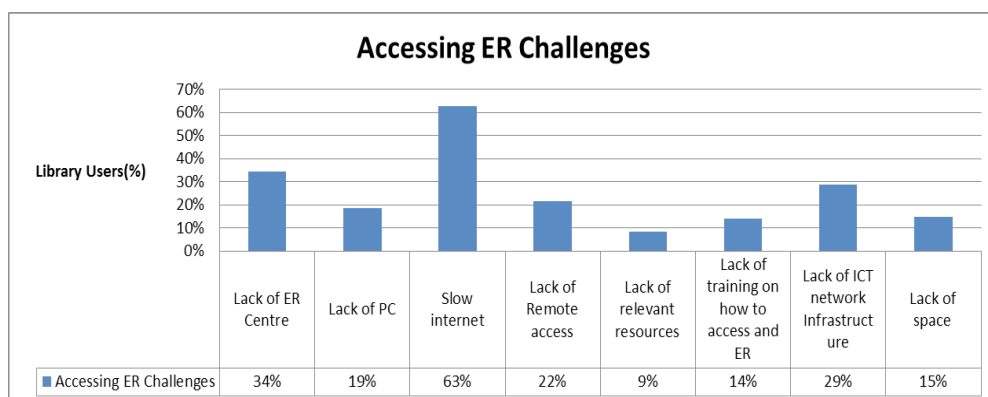


Figure 5: Challenges Encountered in Accessing E-resources

The study sought to establish whether the respondents encountered any challenges while accessing the e-resources at the TUK library. The greatest challenge at 63% was slow Internet which has hindered fast and effective access to the e-resources, followed by lack of an e-resource centre in the library at 34%. This has contributed to low use of e-resources because not

every student has a lap top to access the resources. Lack of library ICT network infrastructure at 29% caused by inadequate funding has also hindered effective use of the e-resources. Unavailability of remote access to the e-resources at 22% is also an indicator that respondents would like to access the e-resources off campus at their convenience. Inability to access personal computer at 19%, is followed by limited space in the library at 15%. In addition, 14% cited absence of information literacy training as a hindrance to the access while only 9% cited unavailability of relevant e-resources.

From the findings, it is evident that slow Internet has negatively affected the use of the e-resources.

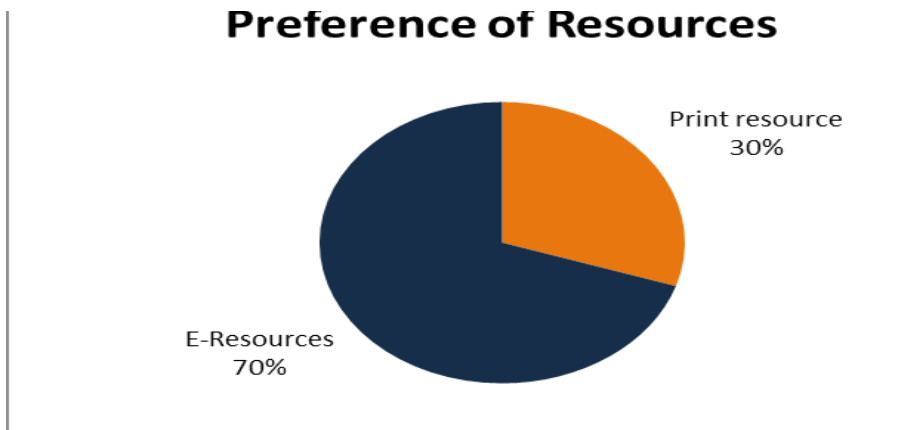


Figure 5: Preference of Resources (Print/Electronic)

Libraries know that print format will not die completely and they must try to balance between the print and e-content in order to meet the needs of various users (Ball, 2016). It is for this reason the study tried to establish what format the respondents preferred. The findings revealed that 70% of the respondents preferred e- resources while 30% still preferred to use print as shown in figure 5.

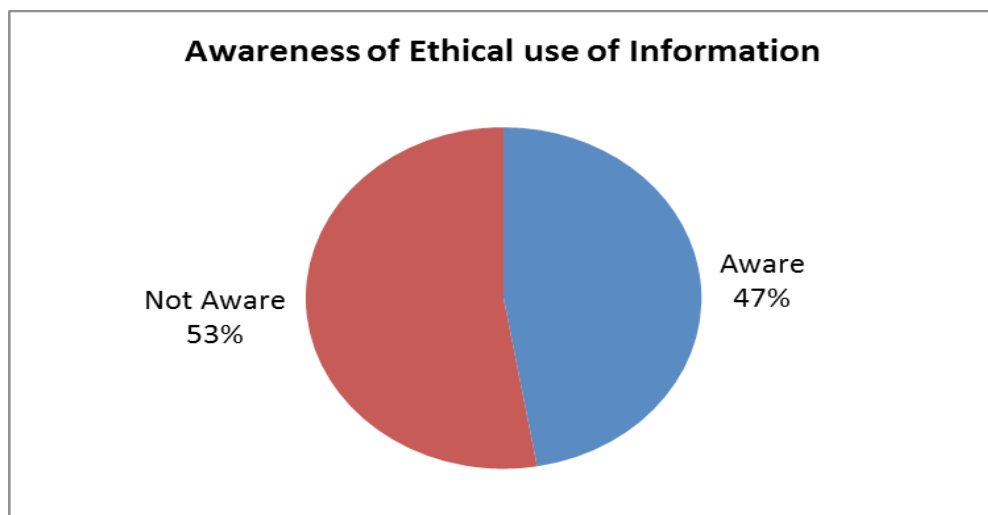


Figure 6: Awareness of Ethical Use of Information

Academic libraries today have to deal with the impact of the new communication technologies in the access and use of information which has brought a fundamental challenge to the professional ethics (Ball, 2016). It was important for this study to find out if the respondents were aware of ethical issues relating to the use of electronic information such as copyright and plagiarism. As shown in Figure 6, 47% of respondents were aware while 53% were not aware.

The respondents were further asked if they would like to be trained on ethical use of information, 40% felt there was need for training while 60% were not willing to be trained. This response is quite worrying because it shows that it is going to be very difficult to deal with ethical issues such as plagiarism if users are not willing to be trained. It can also be assumed that lecturers may not be emphasising the need to avoid plagiarism when students submit assignments and term papers.

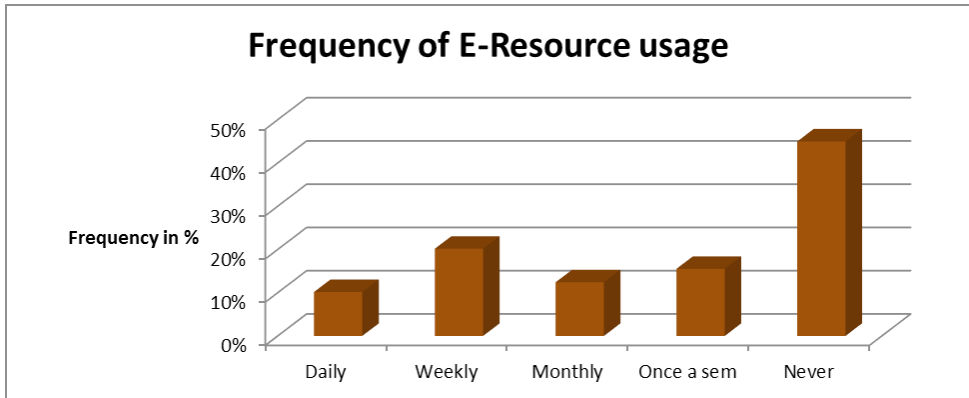


Figure 7: Frequency of E-Resource Usage

The study sought to establish how often the respondents used the e-resources available through the library. The findings paint a worrying picture because although 52% of the respondents were aware of the e-resources, a large number (41%) had never used them. 19% indicated they use them weekly, 11% used them once a semester, 10% accessed them on a monthly basis while 9% used them daily. If use of ICT-based resources to enhance teaching and learning has to be achieved, the frequency of use also needs to increase. Therefore, the TUK library should develop strategies on how to increase the frequency of usage.

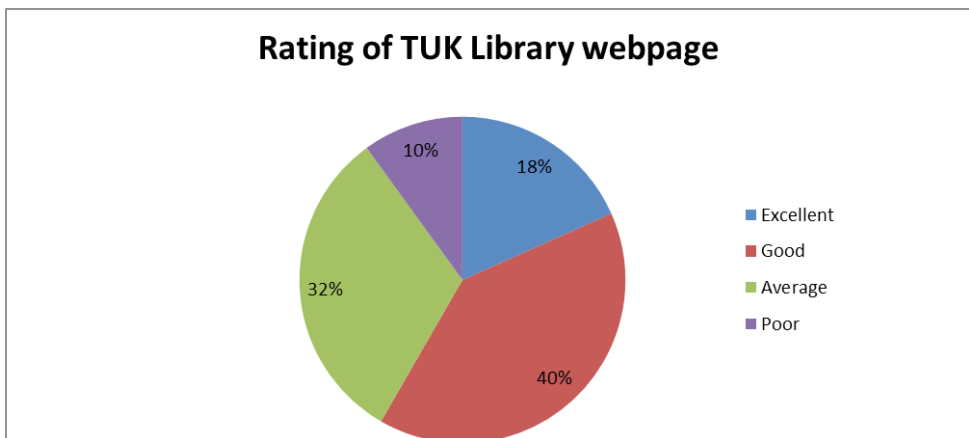


Figure 8: Rating of TUK Library Website

The study sought to establish how respondents rated the library website. This was an important aspect because the website listed the available e-resources and gave guidelines on how to access and search them. The website also announces new additions of resources besides the portal of “Ask a Librarian” which engages users on any queries they may have. 18% said it was excellent, 40% said it was good, 32% said it was average, and only 10% said it was poor. The library needs to develop and implement a relevant strategy to improve this rating.

Teaching Staff Awareness of E-Resources

The study also investigated how aware the teaching staff were of the availability of e-resources in the TUK library. This was important because if the use of e-resources was to enhance teaching and learning at the university, the staff needed to use them and also to refer the students to the relevant ones. It is assumed that unless the teaching staff use the resources, it would be quite difficult for the students to have the culture of using them. This is especially important because of the connection between successful teaching, learning and research with the exploitation of up-to-date and appropriate information; Figure 9 summarises the results

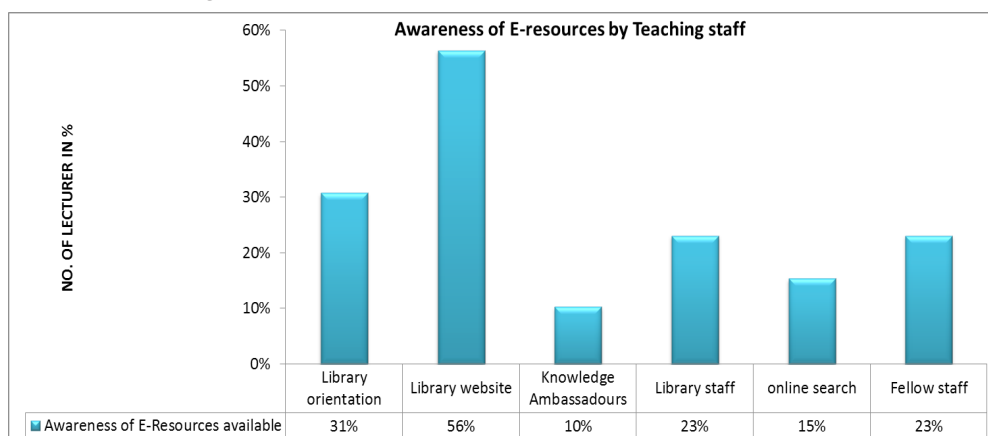


Figure 9: Awareness of E-Resources by teaching staff

The findings show that 56% knew about the e-resources through the library website, 31% through library orientation, 23% through library staff and colleagues, 15% from online search and only 10% from student knowledge ambassadors. These findings imply that the library website is an important tool for creating awareness of e-resources to academic staff. Figure 9 summarises the results.

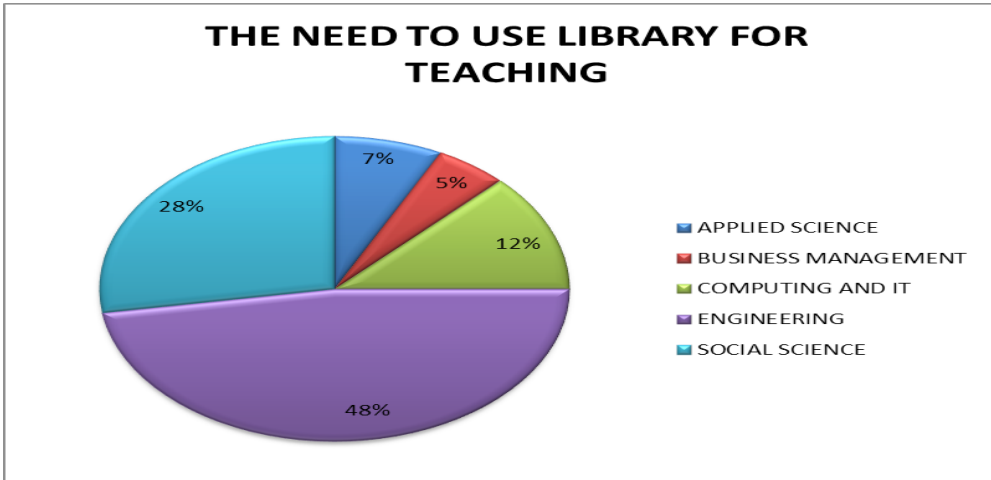


Figure 10: Need to use E-Resources for teaching

The study sought to find out if the teaching staff viewed the use of e-resources to be important for teaching. 48% of the teaching staff from engineering said they found e-resources to be useful in their teaching process; 28% from social sciences and 12% from computing and IT respectively said the use of e-resources was important for their teaching. Only 7% from applied sciences and 5% from business management respectively felt that the e-resources were necessary for their teaching. This can be viewed to mean that the faculties have not fully appreciated the potential benefits of integrating ICT-based information resources available in the library in their teaching, learning and research activities.

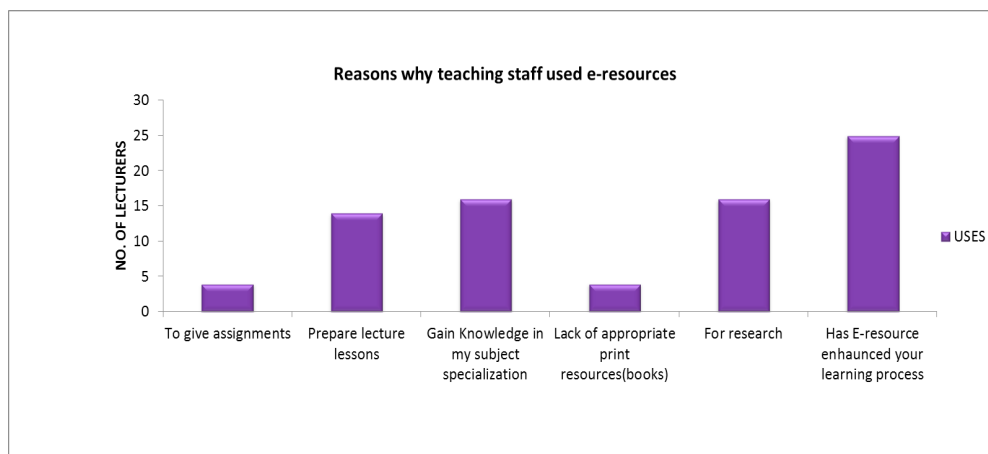


Figure 11: Reasons for using e-resources by the teaching staff

The study sought to establish why teaching staff used the available e-resources. 25% said using e-resources had enhanced their teaching activities, while 16% said they used the e-resources for research. 15% used the e-resources to gain knowledge in their subject while 14% used them to prepare lecture lessons. Only 4% used the e-resources to give assignments. This means that although the majority of the teaching staff acknowledged that the use of e-resources has enhanced their teaching, only a few see the need to use them to give assignments to students. This may indicate that there is lack of student engagement by the teaching staff to encourage them use the e-resources, Figure 11 presents these results.

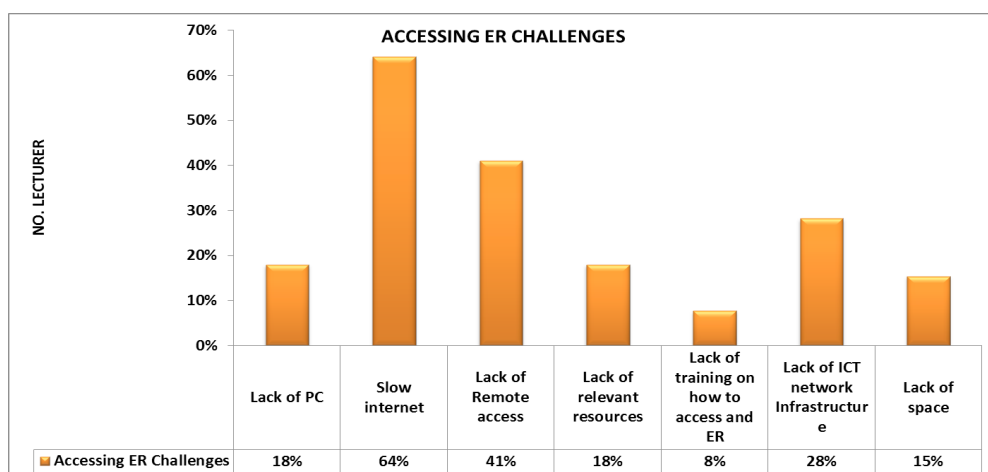


Figure 12: Challenges encountered by teaching staff in accessing e-resources

Just like the data collected from the students, it is evident that slow Internet still remains the greatest challenge with 64% of teaching staff citing it as the greatest hindrance to the use of e-resources. It is followed by unavailability of remote access (41%), poor ICT network infrastructure (28%), inadequacy of relevant resources and lack of personal computer at (18% each), limited space (15%) and lack of training on how to access and use e-resources (8%).

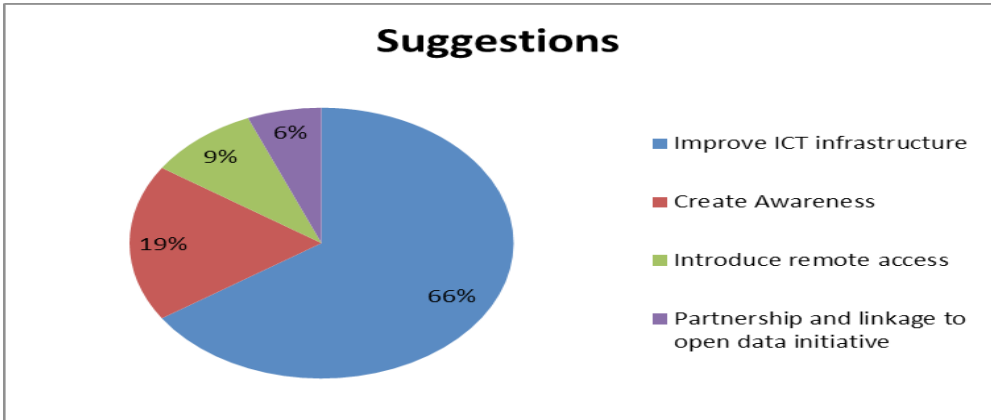


Figure 13: Suggestions on improving services by teaching staff

Figure 13 shows the suggestions given by the teaching staff to be implemented by the library in order to improve use of ICTs to enhance teaching and learning. The majority of the respondents felt the improvement of ICT infrastructure was important at 66% followed by creation of awareness at 19%, introduction of remote access at 9% and partnerships and linkage to open data initiative at 6%.

Conclusion

ICTs have brought great changes in the academic arena. This means that the changing teaching and learning environment has created the need for academic libraries to redefine their roles. The libraries can no longer afford to be passive but have to be active partners in teaching, learning and research due to their capability to provide access to high quality e-resource. They also need to shift their focus from print to electronic materials in order to keep up with the user demands and remain relevant in a highly online environment. The TUK library needs more resources to improve its ICT infrastructure in order to satisfy the diverse needs of its users.

Recommendations

In the light of the challenges encountered and the suggestions given by the users, this study makes the following recommendations:

- a) TUK management should allocate adequate financial resources to the library in order to improve ICT infrastructure and put an e-resources centre in place.
- b) The university should increase bandwidth to ensure faster internet access if the e-resources have to be exploited fully.
- c) The library should design and implement an information literacy curriculum to train both staff and students on access and use of e-resources. This will help increase usage.
- d) Closer relationship and partnership between faculty and the library is necessary if effective use of e-resources to enhance the, learning processing the universities is to be achieved.

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Scaling Up The Use of Mobile Phones to Deliver Agricultural Information to Farmers to Reduce Poverty in Uasin Gishu County, Kenya

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Abstract

The advent of ICTs has changed the way people work, entertain and interact. Yet, the reality is that such changes have bypassed the majority of humankind; the billions of poor people for whom ICTs do not mean much. The poor are mostly involved in producing much of the food that is consumed in the urban areas of most developing nations. It is therefore important that the right information is provided to them so as to harness their potential fully. One way this can be done is through the use of mobile phones that are now a common gadget even in the rural areas. The objective of the study which gave rise to this chapter was to document how the use of mobile phones can be scaled up to enhance access and use of information so as to reduce poverty in Uasin Gishu County, Kenya. The study was a qualitative one in which a case study design was used. Unstructured interview schedules were used to collect data. The collected data were analysed qualitatively using Strauss' grounded theory approach. Some of the major findings were that the people of Uasin Gishu have embraced the use of mobile phones and that there are various devices that can be used to provide information to the rural people in Uasin Gishu. The practical implication of this study is that the findings can be used by the county officers to scale up the use of mobile phones to enhance the access and use of information to support farming activities.

Keywords: *Mobile phones, agriculture, poverty, Uasin Gishu, Kenya*

Introduction

The last decade has witnessed an international consensus that poverty is a human phenomenon associated with an unacceptably low standard of living. The World Bank (2015) defines the poor as those that live on less than 1.25 dollars a day. The European Commission (2001) suggests that poverty should not be defined merely as a lack of income and financial resources. It should also include the deprivation of basic capabilities and lack of access to education, health, natural resources, employment, land, credit, political participation, services and infrastructure. Broadly speaking, therefore, poverty extends

beyond income and consumption to include inequality as well as health and education vulnerability. Looking closely to those manifestations, one would easily see that the missing component in each one of them is information.

This chapter looks at poverty from the information point of view. Therefore, those who are poor are persons who cannot access information they need to harness their potential and use the resources at their disposal. Not accessing here might be as a result of not knowing whether the information exists or not. It is therefore true that lack of information is a crucial dimension of poverty. Access and use of it empowers people to make choices to improve their current situations and have access to means of production (Mukoma & Bosire-Ogechi 2006).

There have been global initiatives to combat poverty such as Millennium Development Goals (MDGs). These MDGs came as a result of the many United Nations (UN) resolutions and conferences that mainly took place in the 1990s. At the end of the UN Millennium Summit in September 2000, all the 191 UN member states signed the final declaration. In doing so, they created a vision that offers the opportunity to focus development outcomes and coordinate efforts among stakeholders. The first MDG was to eradicate extreme poverty and hunger by 2015. Indicators still show that poverty has not been eradicated, hence its prominence in the recently launched Sustainable Development Goals (SDGs). In fact, eradication of poverty is the first of the seventeen goals. This initiative postulates that the world poverty should be ended by 2030. It is important to note that the presence of poverty does not mean that people are not hard working. Research and development in agriculture has been done in various areas including new seed varieties, fertilizers and cropping systems among others. These can boost harvests that are currently low. The question is why these developments have not impacted agricultural productivity. One of the reasons for this is the fact that these innovations have not reached rural farmers. This may be because the provision of information has not been given prominence in the initiatives that are meant to combat poverty. It is important to make information accessible and available in a format that the consumers can utilise. This can be achieved by using mobile phones which are owned by almost everyone (ITU 2016).

Problem Statement

The ICT revolution has affected all of us in the way we undertake our day to day activities. Specifically, mobile phones have simplified the way many people conduct their business. Farmers are no exception. Mobile phones have various benefits that can enhance their adoption. Firstly, mobile phones are now owned by almost everybody. Secondly, companies have come up with smart phones that are more sophisticated and can perform many functions. These phones are affordable and are easy to use. Thirdly, there are regulatory regimes that favour the use of these gadgets. For instance, in Kenya, the person making a call is the one that pays. Moreover, airtime is available in pre-paid and post-paid bundles to allow users to choose a system that suits them best. Mobile phone service providers also introduce tariffs that favour users from time to time. For instance, Airtel in Kenya has a tariff known as “Unliminet” that allows users to pay a certain amount and get a bouquet of services at a cheaper rate. With a monthly subscription fees of 1000 Kenya Shillings (10 USD), one gets 400 minutes of talk time to any network, 3GB of data and 2000 short message service. This means that one gets to call using less than 1 Kenya Shilling per minute to any network. Fourthly, mobile phones are personal gadgets and one can move with them wherever they go. This mobility and personal nature of mobile phones makes their access and use easy.

Uasin Gishu County is considered Kenya’s food basket. A lot of farming activities take place there because of availability of large parcels of fertile land. Availability and access to relevant and timely information by these farmers through mobile phones can increase their ability to raise their productivity and hence increase their incomes and quality of life. Access to relevant information exposes them to resources, tools and processes that can make them more productive; new opportunities to increase their income and improve their livelihoods; markets; networks on which they can depend for their economic activities; and how to convert the resources at their disposal such as labour, skills, experience and the physical resources into value creating opportunities. Even with all these benefits, it is unfortunate that many farmers, for whom mobile services for agriculture have been designed, are not aware of the same. They operate as if the services do not exist and continue to bear the consequences therein. It is therefore important that these services are scaled up in order to enhance their use. In this way, they are likely to overcome the challenges of space, place and time.

Methodology

The objective of the study that resulted into this chapter, was to investigate how the use of mobile phones can be scaled up to enhance access and use of information so as to reduce poverty in Uasin Gishu. The study was a qualitative one. A case study, which is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, was adopted. The author chose this design because she was interested in depth, nuance and complexity of the issues of study, which can only be achieved through qualitative approaches. Furthermore, the author was able to achieve this by exploring a wide array of dimensions in the social world of the respondents. The population of study consisted of the rural people in Uasin Gishu. The respondents were selected through information-oriented purposive sampling with the researcher picking only information rich cases. These comprised farmers and agricultural officers in the County. They were 20 in total. An unstructured interview schedule was used to collect data. The interviewing method allowed for an in-depth investigation into the phenomena under investigation. The collected data was analysed qualitatively using Strauss' grounded theory approach. This was considered suitable because it allowed for data analysis to be done from the early stages of data collection such that if one needed clarifications, the theory allowed for further discovery until the phenomena are fully investigated.

Findings and Discussion

The study found out that the mobile phone was the most commonly used technology gadget by the respondents compared to radio, television and print media among others. In agriculture and business operation among the farmers, mobile phones were used to:

1. Consult extension officers on several issues such as plant and animal diseases, confirmation of information obtained from other sources like their fellow farmers, and markets, among others.
2. Know the prices of products and to compare with what other suppliers are offering. One respondent said:

"A mobile phone is a very important tool. It helps us a lot. When one goes to look for maize, she must use a mobile phone. If we want a customer to bring us maize from Bungoma, we use a mobile phone. Mobile phone is the best when compared with radio and television. Even when you don't know someone and you have been given their mobile phone number, you use the phone to communicate".

3. Make and/or cancel orders. A respondent said that when a supplier's prices go up she calls to cancel instead of travelling all the way to make the cancellation. This saves time and money.
4. Send and receive money, pay for goods delivered, and make advance payment for products ordered, among others. This is done through what is commonly known as M-Pesa (literally meaning mobile money). One female respondent said that she communicates with her supplier of onions from a neighbouring county. Once agreed, the supplier puts the products on public transport and calls her to give the details of the vehicle including the name of the driver or conductor as well as their mobile phone numbers. She then waits for the products to be delivered. As she waits, she calls from time to time to enquire how far the vehicle is. When the products are delivered, she makes her payments through M-Pesa and the supplier is notified accordingly. Depending on how the two parties agree, payments can either be made before or after the delivery is made.
5. Test the market. A farmer indicated that before he takes his tomatoes and vegetables to the market, he calls his customers to enquire whether they need any. Given that these products are perishable, it is important that the time between harvest and disposal is kept as short as possible to avoid unnecessary losses. He added that without this information, one would end up not selling the produce at all or sell it at a "throw-away" price, thus sinking further into poverty.

"I interact with vegetable vendors at the market. They call me to tell me to take certain products to them. One can tell me to take him/her a crate of tomatoes. So I just carry it knowing I am taking it to so and so. I don't have to carry more than I am able to sell. In fact, I don't have to harvest what I will not sell on that day".

The study also established that the perception of farming is greatly changing in the country. A sort of revolution is underway and suddenly farming is beginning to get a name; it is getting noticed and a lot is being written about it on the Internet as well as in magazines, newspapers and journals. There are vast information resources which are Kenya-based. Farmers in Kenya need to know about them so as to access and use them. Furthermore, there are several mobile phone and online applications which farmers in Kenya can benefit from. These include the following:

1. The National Agricultural and Livestock Extension Programme (NALEP) launched a telephony information service known as National Farmers Information Service (NAFIS). This is a government initiative through which a farmer can access information from anywhere through gadgets like the mobile phone or Internet. It is aimed at improving extension services. One can use the SMS service. This can be accessed through: www.nafis.go.ke/.
2. Kenya Agricultural Commodity Exchange (KACE) offers market information, prices, trade information and extension messages. Their SMS service is easy to use, reliable, convenient and low-cost. The information is updated every day and hence its currency. The study however revealed that farmers did not know about it, but some officers knew.
3. Other resources include:
 - Internet-www.mkulimayoung.co.ke; drumnet.com; virtual city; ukulimasmart.co.ke (Kenya farmers portal); digital farmers group on Facebook; mfarm.co.ke; smart farm on YouTube and ciard.net and e-agriculture (global initiatives).
 - Newspapers - The local dailies have sections dedicated to providing farming information. An example of such a section is “smart harvest” in the Wednesday Standard Newspaper which can be found at: <http://www.standardmedia.co.ke/business/category/369/smart-harvest>.
 - Magazines - There are magazines that are available online such as “The smart farmer” and many others. The smart farmer is available at: www.smartfarmerkenya.com.
 - M-Farm - a daily crop price information service that one can use to sell produce and purchase inputs.
 - Soko Pepe by Arid Lands and Information Network (ALIN) - this service provides information on climate changes, product prices, selling services and agricultural methods among others. The service is available at: soko pepe@co.ke.
 - Soko Shambani by mFarmer Kenya - provides a mobile platform that links farmers with restaurants. Another mFarmer service is Arifu Mkulima which provides information on weather, diseases, calendar alerts, farm inputs, financial advice and agrovets. This is available at: www.mfarmerkenya.org.

- Maize variety SMS service - this is a Kenya Plant Health Inspectorate Service (KEPHIS) and Kenya Seed Company service that provides information on the most suitable maize seed variety to grow in a certain area. To get the recommended variety of maize, for instance, for your region, text maize#division and you will get the recommended variety for your region. The steps: 1. Go to “write message” on your handset 2. Type maize#division e.g. maize#kesses 3. Send message to 20441. You will receive details of seed varieties that you can plant in your area. The service is available for both Safaricom and Airtel. This information is available at: www.kephis.org.

From the foregoing, it is evidently clear that mobile telephony is the way to reach the farmers in the rural areas. This is because the farmers have embraced its use. This can be done through:

1. Extension

Mobile phones should be used to offer extension services because the ratio of farmers to extension officers has gone up tremendously. Farmers have embraced mobile telephony and products have been developed. These should not be left to operate in isolation. In Kenya, this ratio stands at 1:1200; against the standard of 1:400 (Kamau, 2014). What these statistics mean is that if an extension officer plans to visit four farmers every day, it will take him a whole year to visit each farmer once. But with mobile phones, all those farmers can be visited in a day or just once by sending a text message for instance to all farmers. One farmer in Uasin Gishu County who keeps chicken had this to say:

“I have been making calls to the Ministry of Agriculture offices for two weeks now to find out the best way to vaccinate my chicken but I have not been successful. Then when I had given up, a friend of mine offered to help me by logging on to the Internet and accessing the information. I was so happy because I was able to get more than I needed. I visited the Kenya Agricultural and Livestock Research Organization website at: www.kalro.org.

2. Content creation

There is need to create content that is appropriate to specific agricultural activities of the counties or regions. This content can then be disseminated to farmers through mobile phones. The new generation farmers are young, confident, ambitious and techno-savvy. This group is plugged in to the Internet for hours on end, seven days a week on their ipads, blackberries, laptops, cell phones and other gadgets. They seem to be interested in the

practice and are engaged in it with as much zeal as they do when using social media. They have created mobile pages to showcase their products. For instance, there is a young lady who has created a facebook page known as “Mary Poultry” at <https://www.facebook.com/public/Mary-Poultry-Farm>, on which all matters pertaining to poultry are discussed.

3. Awareness creation

The applications should be rolled out in the rural areas as a matter of urgency. This can be done by the county governments that already know who their farmers are and what service can suit them better. As already indicated earlier, good services and programmes that can be useful to farmers exist, but very few of these farmers know about these programmes. There is therefore need for county agricultural executives to roll out these programs so that all farmers get to know that they exist. At the moment, it is mostly agricultural officers that know about them.

Conclusion

From the foregoing, it is without doubt that mobile phones will play a very significant role in the post 2015 development agenda and in facilitating the timely achievement of SDGs as the world moves faster and faster towards a digital society. This calls for scaling up of mobile phone use in all sectors of the economy especially in agriculture, which is the backbone of Kenya’s economy. Kenya has made great strides in the expansion of telecommunications services. The country has made great strides in the development of mobile services (m-services) as seen in improved network infrastructure - which has seen great penetration of mobile phones (now at 89.2%) leading to a growth in customer base - mobile cellular operators include Safaricom, Airtel International, Equitel and Telkom’s Orange. A new entrant is Sema Mobile Services. This will be a positive step towards harnessing the full potential of mobile phones and go a long way in scaling up their use in supporting the attainment of the SDGs by 2030.

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An Assessment of The Accessibility of Electronic Information Resources by Academic Library Users: A Case of The University of Nairobi

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Abstract

The purpose of this chapter is to examine the accessibility of electronic information resources by the Jomo Kenyatta Memorial library users. The chapter is grounded on a study that used a mixed method research design (both quantitative and qualitative) to gather and analyse data on the subject area. Data collection instruments used included questionnaires and interview guide. A sample size of 50 students and 8 staff were randomly selected for data collection. The study revealed that slow Internet connectivity, inadequate computers, little time allocation for computers usage and poor retrieval skills by the library users affected effective access and use of electronic information resources. The findings of this study will help the library management to understand the factors affecting accessibility of electronic information resources. This will help improve service delivery and meet the needs of the library users. Accessibility and utilisation of relevant electronic information resources is vital for efficient research output. Access of electronic information resources in academic libraries helps in bridging the knowledge divide.

Keywords: *Academic library, accessibility, electronic information resources, Kenya, library users.*

Introduction

The evolution of Information Communication and Technologies (ICTs) has brought a great change in the way libraries provide services. Libraries have continued to embrace technologies by way of implementing Internet-related operations in the library management. This has led to the introduction of electronic resources to the library's collection and services to support users' learning needs and research programmes. Access to electronic information resources enhances quality research output in institutions of higher learning. This helps in global knowledge sharing through open access program.

The University of Nairobi begun as the Royal Technical College in 1956 and in 1970 became the first national university in Kenya. It is the largest institution of higher learning in Kenya. It was ranked first among all public and private universities in Kenya during the 2016 webometrics analysis (source: <http://www.uonbi.ac.ke/taxonomy/term/61>). The University of Nairobi has a total of 12 libraries. These libraries are under the six constituent colleges of the university with Jomo Kenyatta Memorial Library (JKML) being the central library.

The Jomo Kenyatta Memorial Library has the following sections; library administration offices, digital unit, library studies department, the graduate research library, East Africana section, periodicals collection, and central services section. The central services section is also subdivided into acquisitions, circulation, cataloguing, bindery, archives and a computer laboratory. Jomo Kenyatta Memorial Library provides access to over 76,000 peer - reviewed electronic journals and over 30,000 electronic theses and dissertations and electronic books. These can be accessed through the university library's website (<http://uonlibrary.uonbi.ac.ke/>). The library has subscribed to different databases to facilitate access to electronic knowledge that includes: AGORA, AJOL, HINARI, OARE, EBSCO Host, JSTOR, Emerald Group Publishing Ltd among others.

Statement of The Problem

There is a need to adopt new strategies to promote and enable ease of access and use of electronic information by the users in academic libraries. However, this has not been the case in most public universities in Kenya. As a result of this the quality of research output is adversely affected since users' needs are not met. It is with this in mind that the authors decided to conduct a study to establish whether the Jomo Kenyatta Memorial Library at the University of Nairobi has enabled ease of access to electronic information resources among users to satisfy their user needs.

Objectives

The study was guided by the following objectives:

1. To identify the various users of electronic information resources.
2. To examine the awareness of the availability of electronic information resources by users.

3. To assess the extent of access and use of electronic information resources by users.
4. To propose strategies of promoting accessibility and use of electronic information resources.

Justification

Access to knowledge resources is very crucial for conducting proper research. It is against this that the researcher decided to conduct a study to evaluate the ease of access of electronic information resources among users at Jomo Kenyatta Memorial Library. This study therefore will be an eye opener to knowledge institutions, scholars and other researchers on the importance of enhanced accessibility to electronic information resources in dissemination of knowledge with the view of bridging the knowledge divide and enhancing quality research output.

The findings of this study will give the library management an understanding of factors affecting accessibility of electronic information resources. This helps to improve service delivery and meet the needs of the library users.

Literature Review

Libraries in institutions of higher learning have a critical role to play in supporting the core mission of their university which include teaching, learning and research. It is crucial that universities embrace technology and its advancement if they are to be rendered relevant in the modern academic world. In order for a library to achieve its role of disseminating information materials to the users, technology has to be incorporated in the library operations. The Internet is one of the useful communication tools that should be incorporated in libraries to aid librarians and library clientele in institutions of higher learning gain access to information resources. The Internet also helps to link local researchers, scholars and their counter parts in various parts of the world.

Facilitating access and use of online information resources is one of the ways an academic library can achieve the objective of service delivery and meeting the needs of the library users. However, most library users are not aware of the quality and variety of electronic information resources available to them. Students and researchers are often contented with information materials that an experienced librarian would find inadequate and inappropriate. The materials accessed by students and researchers for their reading are mostly in print form. Access to relevant information materials is necessary for any researcher to take efficient research.

Significance of Electronic Information Resources

E-resources promote efficiency when disseminating information for research purposes. Sharma (2009) notes that e-resources are vital in ensuring efficient retrieval and dissemination of information which is of prime importance to any academic library. In addition, the use of electronic information resources enables the faculty members and the students to effectively and efficiently access digital information to assist in their research, problem solving and making decisions related to teaching and learning. Ani *et al.* (2014) opine that access to electronic information resources can be done at the comfort and convenience of users without them having to physically visit the library building.

Omotayo (2010) argues that, reading an electronic journal is different from reading a print journal. Many library users have started to acknowledge the possibility that electronic documents offer advanced features and many functionalities beyond what is available in the printed form. There are many merits of using electronic information resources over print. Shama (2012) notes some of these advances as the ease of use, remote access, ability to select multiple files at the same time, ability to save, print and repeat searches more frequently.

Factors Affecting Access and Use of Electronic Information Resources

The following were identified as affecting the access and use of electronic information resources in academic libraries.

Information Literacy

Literacy on retrieval of information is paramount for quality research. This helps the user access and use relevant information. Omotayo (2010) notes that despite the available training programmes on the use of electronic information resources in the library, most users do not register for the training. This leaves the users spending more time trying to retrieve information needed, which would have taken less time if one has the necessary information retrieval skills.

Sukula (2010) suggests that the skills required in obtaining potential information from electronic information resources are much greater than those required to access print information resources. These skills include knowledge of the structure of the available database and searching term and also an understanding of the ways in which the instructions are linked to one another. To acquire this skill, it is importance to go through intensive

trainings. Tella (2010) suggests that libraries must reach a position where the acquisition of information skills is acknowledged as one of the key objectives for every freshman in the university. This promotes ease of using electronic information resources.

Users' Attitudes towards Electronic Information Resources

The advancement of Information and Communication Technology (ICT) has brought a revolutionary change in the management of information. This has provided various options to the library users in accessing information in a more convenient way. As a result of this, Swain and Panda (2009) observe that modern libraries that have embraced technology have been able to satisfy the needs of their users. Such libraries have been able to stock current and voluminous information resources without being held back by challenges of space.

A study by Egberongbe (2011) showed that 77% of lecturers preferred to use electronic information resources compared to print resources. This is because less time was consumed accessing such information resources compared to print information materials. The study also showed that most of the lecturers sought for academic information from databases other than the library subscribed online databases because of the various constraints they encountered when accessing already subscribed online databases. The faced constraints directly contributed to the low patronage of the library's online academic databases by the faculty members.

Methodology

The study adopted a mixed method research design (both quantitative and qualitative methods). Questionnaires were used as instruments to collect data from 50 students and 8 members of staff who were randomly selected. Interview guide was used to collect data from the Graduate Research Library librarian and the e-resources computer laboratory librarian.

Findings of The Study

Out of the 50 questionnaires distributed to the students' respondents, 48 were returned, giving a 96% response rate. Seven (7) questionnaires out of eight (8) distributed to the members of staff were returned giving 88% response rate. Two interviews were successfully conducted with the librarians from the graduate research library and the electronic resources laboratory.

Demography of the Respondents

The analysis of the research results indicates that most respondents were male (53%). Most of the respondents were at the postgraduate level of study (67%) and the rest at the undergraduate level of study.

Users of Electronic Information Resources

The analysis of research results showed that users of electronic information resources at the Jomo Kenyatta Memorial Library were the undergraduate and post graduate students, academic staff, library staff and other authorised researchers who use the library.

Users' Awareness of Electronic Information Resources

All the respondents acknowledged high rate of awareness of the existence of electronic information resources.

Various platforms were identified through which library users learn the existence of electronic information resources and are shown on Table 1. Freshman orientation was identified as the common platform at 48% while through fellow students was the least form at 6%. This shows the library's commitment to creating awareness and training of the users.

Table 1: Library Awareness Platforms

No.	Platform	Frequency	Percentage (%)
1	Freshman orientation	23	47.9
2	Lecturers	6	12.5
3	Websites	10	20.8
4	Library staff	6	12.5
5	Fellow students	3	6
	Total	48	100

The staff respondents acknowledged the use of electronic information resources and 100% of the respondents recommended students to use electronic information resources in their studies. Strategies which the library uses to create awareness amongst the users were identified as: library open week, talk shows and marketing through brochures and fliers.

Access and Usage of Electronic Information Resources

Research findings showed that daily usage of electronic information resources was 42%, similar to once a week at 42%, while monthly usage was at 16%. This is done by means of library computers, remote access or wireless. This indicates high usage of electronic information resources by the Jomo Kenyatta Library users. This is in consistent with the study by Oghenetega and Kayonde (2013) who found out that 90% of the respondents indicated 90% usage of electronic information resources.

The information resources highly used were e-journals (60%), online databases (20%), e-books (13%) and e-thesis (7%). The university management has established other computer laboratories within the university and other departmental libraries to try decongest the Jomo Kenyatta Memorial Library. The library has also provided training programmes to the users and uploading more information resources such as e-thesis to enhance access and use. The respondents acknowledged low usage of electronic information resources at the Jomo Kenyatta Memorial Library at an average of 700 users a month. This is a low patronage in relation to the high student enrolment in a semester.

Challenges Encountered in Accessing Electronic Information Resources

Various challenges faced while accessing electronic information resources were identified. Slow Internet and inadequate number of computers were cited as the major challenges by 80% of the respondents. It was noted that only 20 computers were available for use in the computer laboratory to cater for both undergraduate and master's students. At the graduate research library, there were only 10 computers for doctorate students and authorised researchers.

Fifty per cent of the respondents stated that most of the articles were not available in full-text while access to other texts was restricted. Ten per cent of the respondents indicated that most of the information materials in electronic journals lacked the local context. Some databases required username and passwords that the users did not have, as stated by 30% of the respondents.

Information explosion was cited as a challenge by 30% of the respondents. Challenges in accessing electronic information resources were identified by 70% of the respondents. Another 50% of the respondents lacked skills on information retrieval. Some users enrolled in PhD programmes were noted to be computer illiterate. This restricted their capacity to access electronic information resources. This therefore prompts the library staff to teach users basic computer skills as well as how to access and use electronic information resources.

This study is in agreement with that of Okiki (2012), which found out that slow Internet access (29%), erratic power supply (30%) and too much of information overload (23%) were the major constraints affecting the use of electronic information resources.

Strategies of Promoting Accessibility and Use of Electronic Information Resources

The respondents were asked to propose possible solutions to promote access to electronic information resources. The responses were as follows: increase the number of computers for use by the library users; integrate basic computer lessons in the syllabus for students at all levels; provide more training on how to search for relevant information from different databases; subscribe to local and subject related journals by the library management; increase bandwidth to ensure constant Internet access; enabling unrestricted remote access; and creating awareness of the availability of electronic information resources amongst the users.

Conclusion

In this ICT era, electronic information resources are significant in meeting the needs of the library users. This helps to overcome the challenge associated with library space and enhancing access to information resources at the user's convenience. The library spends a lot of financial resources in the subscription of electronic information resources. It is therefore important to ensure these resources are utilised by the targeted users.

Recommendations

It is recommended that the Jomo Kenyatta Memorial Library devise a "one stop shop" search database to overcome information explosion. Reliable Internet will enable more users to access and utilise the available electronic information resources. This will improve the quality of research output and knowledge sharing among the scholars.

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Section Two: Knowledge Sharing and Diffusion

Strategies for Managing Knowledge and Innovation in Nigerian Agricultural Research Systems

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Abstract

This chapter discusses the strategies used in the management of knowledge and innovations by five Nigerian agricultural research institutes. The chapter is informed by a research study that employed a quantitative approach through survey questionnaire to collect data from the population of research scientists in five Nigerian agricultural research institutes. The author found that personalisation strategy (human-based), through interaction and social networking in non-IT environment, was the dominant strategy used to derive research and innovations, followed by codification strategy (ICT-based). The author also discovered that knowledge management initiatives such as improved documentation of existing knowledge, changing organisational culture, improving co-operation and communication, externalisation, training, education and networking, improving retention of knowledge, improving access to external knowledge and reduction of cost of service delivery, among others, were used to promote knowledge and innovation management. Community of practice and community of knowledge were the two knowledge management best practices adopted for the strategic management of knowledge resources in the five research institutes. These results will encourage the adoption of hybrid knowledge and innovation strategies in the institutes for the improvement of agricultural sector in Nigeria. This is because knowledge and innovation cannot be properly managed without the adoption of an integral approach comprising of personalisation and codification strategies for enhanced access, utilisation and dissemination of resources to the stakeholders in the institutes. The findings will also add to the understanding of knowledge strategies used and acknowledgement of the necessity to strengthen codification strategies in the institutes. This study is unique in that no other exists in the literature.

Keywords: *Knowledge management, innovation, agricultural institutes, agricultural research systems, Nigeria, knowledge strategies*

Introduction

Nigeria is the most populous country in Africa with an estimated population of over 174 million people (CIA World FactBook, 2014). As a country, Nigeria has the largest and most elaborate national agricultural research system in Sub-Saharan Africa consisting of three agricultural universities, 37 World Bank assisted agricultural development projects, 11 river basin development authorities, 17 agricultural research institutes and many faculties of agriculture in both federal and state universities. Ajaikaiye and Olusola (2003) observed that the knowledge system of any progressive society performs a pivotal function in its development. Success of knowledge strategies in this 21st Century depends on whether or not the system can link its business strategies to the knowledge requirements embedded in the system. This articulation is vital for allocating resources and capabilities for explaining and leveraging knowledge (Madalina, 2010). However, Ajaikaiye and Olusola (2003:24) note that “in spite of this recognition, the attention given to Nigeria’s knowledge system has been weak and unstable, and has therefore affected its effectiveness and utilisation”. In this regard, the challenge for institutions and countries is thus to determine and develop organisational practices, principles, guidelines and approaches on how knowledge can be created, harnessed, shared, tracked and distributed among government agencies, research communities and the public.

Knowledge creation in organisations such as agricultural research institutes starts with people sharing their internal tacit knowledge by socialising with people or by obtaining it in digital or analogue form (Riley, 1998; Bassi, 1997). The shared knowledge is then internalised by other people who generate new knowledge. This newly created knowledge is again shared with other people and the process repeats itself. Agricultural researchers (research institutes, universities, NGOs, private companies and farmers) are engaged in developing technologies, finding new ways of improving agricultural production and the value of agricultural products. Research helps to solve specific scientific problems and provides policy-makers with methods and tools that help to formulate policies. Research provides assessments of farming practices and policies and points out necessary reforms. Roling and Wagemakers (1998) indicated that farmers were expected to become experts in external wisdom and technologies and were not just adopters of technology. They made the point that farmers needed to adapt the new practices to suit their local situations. This implies that farmers, too, need to experiment and be part of the process to enhance their farming systems.

Statement of The Problem

The creation of an economy in which knowledge-based industries are the leading industries is the goal and focus of government policy in a number of countries including the United Kingdom, Singapore, United States of America and Australia (Morrow, 2001). In 1597, Francis Bacon observed that 'knowledge is power' (Barclay, 2000). This opinion was shared by US President John F. Kennedy who in 1962 at a White House reception to honour Nobel Prize winners, said 'in a time of turbulence and change, it is truer than ever that knowledge is power'. He further stressed 'knowledge is the only meaningful resource today'. Today businesses and organisations are well advised to manage knowledge as effectively as possible. Knowledge is the fundamental basis of competition (Zack, 1999) especially in an economy where the only certainty is uncertainty; the one sure source of lasting competitive advantage is knowledge (Nonaka, 1991). A new economy is emerging built on knowledge and innovation and at its centre are knowledge workers, whose mission is not just to create a world of new products and services, but also to rethink the larger purposes and day-to-day practices of the world of business (Ruggles & Holthouse, 1999).

During the 1950s, 1960s and early 1970s, agriculture was the mainstay of the Nigerian economy and contributed over 94% of government revenue and 60-70% of total exports (Daramola *et al.*, 2008). Since the discovery of oil in Nigerian in the 1970s, agriculture's significance has declined and oil now totals 95% of exports and 40% of government revenues (EIA, 2012). At present, agriculture only accounts for 0.2% of exports (Daramola *et al.*, 2008). Declining agricultural production arising from total dependence on crude oil exports as a means of growing the economy has relegated the role played by the agricultural research institutes in innovation development and knowledge discovery. These are now characterised by a myriad of problems such as poor knowledge management infrastructure, capacity building declining research culture, poor staff motivation, inadequate government support and a perennially declining research budget.

Consequently the main objective of the study resulting into this chapter was to investigate the strategies used managing knowledge and innovation in five Nigerian agricultural research institutes.

The study addresses the following research objectives:

1. To investigate the knowledge strategies used to derive research and innovation in the Nigerian agricultural research institutes; and
2. To identify the knowledge management initiatives used to promote knowledge and innovation management in the research institutes.

Review of Related Literature

According to Jasimuddin (2008), the emergence of KM discipline has coincided with the development of the global knowledge-based economy in which emphasis has shifted from traditional factors of production, namely capital, land and labour, to knowledge. Parallel to this, Drucker (1992) suggests that classical factors are becoming secondary to knowledge as the primary resource for the economy. The success of organisations (such as agricultural research institutes) in the post-industrial world seemingly lies more in their intellectual abilities than in their physical assets (Hargreaves, 1999; Bassi, 1997; Riley, 1998). This requires the transformation of personal knowledge into institutional knowledge that can be widely shared throughout the institution and appropriately applied (Bryans & Smith, 2000). The acquisition of knowledge and skills can be seen as an investment in the future (Robinson & Ellis, 1999).

Nicke and Ayola (2004), cited in Uganneya, Ape and Ugbagir (2013) reported that 81 government and higher education agencies were engaged in agricultural research in Nigeria in 2000. Together they employed over 1,352 full-time equivalent researchers and spent 3.6 billion naira in 1999 on agricultural research and development. This was equivalent to US\$106 million in 1993 yet the rate of growth and development of agricultural innovation has in the recent past not been encouraging. A more important factor responsible for low agricultural production is related to the fact that researchers/lecturers, students, extension workers and other stakeholders are not adequately provided with information services and resources that would improve agricultural production through innovation development and management.

Mario and Fatima (2011) carried out empirical studies using a survey methodology with a sample of 111 Spanish companies belonging to innovative industries. The findings provide evidence of a moderating effect of knowledge-centred culture, knowledge-oriented leadership and knowledge-centred human resource management practices in the relationship between

knowledge exploration and exploitation practices as well as innovation outcomes of companies. In line with previous literature, KM practices are important for innovation purposes. However, when certain enablers such as organisational factors to overcome human barriers to KM are properly established, the innovation capacity of the firm can be more successfully exploited.

Coyte, Ricceri and Guthrie (2012), examined the processes used to control the management of knowledge resources in small and medium enterprises (SMEs) in the economic sector of Australia. They compared the findings with the underlying assumptions and prescriptions of intellectual capital guidelines designed for SMEs. It was found that Tech Limited's knowledge development processes resulted in substantial relational capital. This was built on its licence with Scand Co. and its market reputation achieved through the provision of high quality-products and service delivery. It further revealed that informal, intensive dialogue-based processes, structured by an overriding management philosophy, governed by strategisation and the management of knowledge resources were the functional KM initiatives and strategies for the enterprises. Ajay and Hans (2013) conducted an empirical study with 210 middle and senior managers in a large thermal power generation organisation to investigate the impact of the cognitive styles of leaders on knowledge management practices in a public sector organisation in India. The results of the exploratory factor analysis showed three significant factors of cognitive styles namely; radical, innovative-collaborator and adaptor.

Methodology

The main methodologies in social research include the quantitative and the qualitative (Babbie & Mouton, 2001; Creswell, 2003) and mixed methods research (Creswell & Plano, 2007; Greene, 2008; Teddlie & Tashakkori, 2009). In this study, the author used quantitative approach employing questionnaires to collect data from the sample of research scientists. This was largely due to the large sample size of 286 respondents. There are 17 agricultural research institutes in Nigeria. Out of the 17, a sample of five research institutes was purposively chosen from the five geopolitical zones. Maximum variation purposive sampling was used by the author to gain greater insights into the phenomena by looking at them from all angles. Each zone had one major agro-based research institute (Agricultural Research Council of Nigeria, 2008) as shown below.

1. National Root Crops Research Institute (NRCRI), Umudike, Abia State (South- East) covering Abia, Akwa Ibom, Anambra, Bayelsa, Cross-Rivers, Ebonyi, Enugu, Imo and Rivers States.
2. Institute for Agricultural Research and Training (IAR&T) Ibadan, Oyo State (South-West) covering Ogun, Oyo, Osun, Ondo, Ekiti, Edo and Delta States.
3. National Cereals Research Institute, Badeggi, Niger State (North-Central) covering Niger, Abuja FCT, Kwara, Kogi and Benue States.
4. Institute for Agricultural Research (IAR) Zaria, Kaduna State (North-West) covering Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara States.
5. Lake Chad Research Institute (LCRI), Maiduguri, Borno State (North-East) covering Gombe, Bauchi, Taraba, Yobe and Borno States.

The choice of the five institutes was predicated on the fact that they serve as zonal agricultural research coordinating institutes for all the states within their respective zones (A.R.C.N, 2008). The population of the five institutes stood at 1,363. According to Israel (2012), if the population is 1,363 at $\pm 5\%$ precision, the sample should be 286 at the 95% confidence level. In this regard, 214 research scientists were randomly selected and questionnaires administered to them. The sample for researchers was distributed among the five research institutes proportionately, using a formula recommended by Krejcie and Morgan (1970) represented below:

$$\frac{N * S}{TP}$$

Where,

N = Number (i.e. population of each institute)

S = Sample T (total sample size)

P = Population

Based on this formula, the distribution of samples across the five research institutes is;

- 1) I.A.R Zaria; $\frac{274 \times 286}{1363} = 58$
- 2) I.A.R. & T Ibadan; $\frac{292 \times 286}{1,363} = 61$
- 3) L.C.R. I Maiduguri; $\frac{267 \times 286}{1,363} = 56$
- 4) NCRI Badeggi; $\frac{262 \times 286}{1,363} = 55$
- 5) N.R.C.R.I Umudike; $\frac{292 \times 286}{1,363} = 61$

Findings and Discussions

The response rate from the total number of questionnaires which were administered to the respondents is depicted in Table 1 below.

Table 1: Response rate from the five research institutes (N=214)

Institutes	Expected Respondents (N=276)	Actual Respondents (N=214)	% of Actual Respondents
I.A.R. Zaria	56	47	83.10
I.A.R.&T. Ibadan	59	42	71.18
N.R.C.R.I. Umudike	54	44	81.48
N.C.R.I. Badeggi	53	41	77.35
L.C.R.I. Maiduguri	54	40	74.07
Total	276	214	77.6

Source: Research data

The results in Table 1 above show that 214 (77.6%) of the 276 questionnaires sent were completed and returned. In this regard, 47 (83.10%) were returned from I.A.R Zaria, 42 (71.18%) from I.A.R. & T. Ibadan, 44 (81.48%) from N.R.C.R.I. Umudike, 41 (77.35%) from N.C.R.I. Badeggi and 40 (74.07%) from L.C.R.I. Maiduguri. From these results, it is evident the highest returns were recorded at I.A.R. Zaria, with 83.10%, followed by N.R.C.R.I. Umudike, with 81.48%. Further demographic analysis was conducted to determine the department/unit/programme, educational status, gender, age, years of working experience and position/rank of the respondents in the research institutes.

The study revealed that the majority of the respondents were male 151 (70.6%) while 57 (26.6%) were female. The respondents worked in various

departments/units/programmes of the institutes, as follows: 18 (8.4%) were working in the agricultural economics and extension programme, 29 (13.6%) in the farming system, while 26 (12.1%) were working in the biotechnology department. The findings further revealed that 38 (17.8%) of the respondents were working in the product development programme, 24 (11.2%) were in the research outreach departments of the institutes, while the majority 79 (36.9%) of the respondents were working in other departments/programmes, which include; the cassava programme, yam programme, sweet potato, cocoyam, ginger, post-harvest, technology, maize, banana, kenaf and jute, cereals, trypanotolerant livestock, grain legumes, land and water resource management, cowpea, groundnut, cotton, confectioneries, castor and tomato programmes.

Furthermore, the data showed that most of the respondents were in the age bracket of 29-49, with educational qualifications ranging from Master's degree 62 (29.0%) and PhDs 62 (29.0%), serving at the rank of Research Officer I & II.

Knowledge Strategies Used in the Institutes

The findings of the study show that personalisation strategy, based on social networking and interaction was the dominant strategy used by the institutes to manage their knowledge. The results revealed that the majority of the respondents 152 (71.0%) had the view that the human strategy was often used. 106 of the responded (49.5%) indicated that codification strategy, based on ICTs was used and another 103 (48.1%) said the system strategy was not available in their institutes. It was observed by the author that the situation of non-application of ICT-based services for KM could be attributed to the perennial infrastructural problem such as electricity, Internet service and other ICT facilities that characterised the Nigerian system. The rest said the system strategy was available, but the researcher noted that the facilities used were personal property of the respondents. Due to the proliferation of mobile phones in Nigeria in 2001 various applications such as social media and other or related systems of communication are used to share practices, experiences and know-how in the country.

However, much of the literature reviewed (Scarborough, Swan & Preston 1999; Storey & Barnett, 2001; Alavi & Leidner, 2001; Bhatt, 2001; Newell, Swan, Galliers & Scarborough 1999; Broendsted & Elkjaer, 2001; Huber, 2001) suggested that ICTs can play a central role in the transfer of an organisation's knowledge. They make the transmission of explicit knowledge faster and easier. Carbonara (2005) suggests that such tools have the capability to

transfer the vast array of knowledge by reducing the space and time barriers. This is not supported by the empirical evidence of this study, as the majority of the respondents claimed dominance of human strategy is best in sharing knowledge. This is also in contrast to the view of Loeb, Raj, Ramaprasad and Sharma (1998), who observed that technology-assisted tools enable co-ordination across geographical distance and time worldwide.

A study by Jasimuddin (2008) on knowledge strategies in a UK-based group within a high-tech global corporation found the deficiency of a single KM strategy, because the findings revealed that the transfer of explicit knowledge is better with ICTs, while transfer of tacit knowledge is much effective via conversation, thereby suggesting a hybrid strategy which recognises the interplay between the soft and hard mechanisms.

Knowledge Management Initiatives Available at the Institutes

The author wanted to know the KM initiatives adopted by the research institutes for proper management of knowledge. The results are shown in Table 2 below.

Table 2: Knowledge Management Initiatives Used at the Institutes

KM Initiatives	Responses							
	Available		Not Available		Missing Value		Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Identification of Existing Knowledge	190	88.8	16	7.5	8	3.7	214	100.0
Improved Documentation of Existing Knowledge	203	94.9	5	2.3	6	2.8	214	100.0
Changing of the Organisational Culture	117	54.7	83	38.8	14	6.5	214	100.0
Improving Co-operation and Communication	186	86.9	17	7.9	11	5.1	214	100.0
Externalisation: turn tacit to explicit	136	63.6	59	27.6	19	8.9	214	100.0
Improving Training, Education and Networking of Newly Recruited Employees	193	90.2	14	6.5	7	3.3	214	100.0
Improving Training and Education of all Employees	183	85.5	27	12.6	4	1.9	214	100.0
Improving Retention of Knowledge	175	81.8	20	9.3	19	8.9	214	100.0
Improving Access to Existing Sources of Knowledge	197	92.1	8	3.7	9	4.2	214	100.0
Improving Acquisition or Purchasing of External Knowledge	143	66.8	57	26.6	14	6.5	214	100.0

Improving Distribution of Knowledge	184	86.0	25	11.7	4	1.9	214	100.0
Improving Management of Innovations	178	83.2	30	14.0	6	2.8	214	100.0
Reduction of Costs	110	51.4	84	39.3	20	9.3	214	100.0

The distribution of KM initiatives available (Table 2) in the institutes show that the respondents who indicated that existing knowledge was not available were 190 (88.8%), while 16 (7.5%) claimed it was available; improved documentation of existing knowledge 203 (94.9%) available, and 5 (2.3%) opined that it was not available; changing of the organisational culture 117 (54.7%) was available, 83 (38.8) not available; improved co-operation and communication 186 (86.9%) of the respondents claimed it was available, while 17 (7.9%) indicated not; externalisation 136 (63.6%) available, while 59 (27.6%) had claimed not available; improving training, education and networking of newly recruited employees 193 (90.2%) were of the view that it was available, while 14 (6.5%) answered not available; improving training and education of all employees 183 (85.5%) said not available, and 27 (12.6%) of the respondents believed it was not available; improving retention of knowledge 175 (81.8%) opined was available, while 20 (9.3%) said not available; improving access to existing sources of knowledge 197 (92.1%) believed was available and 8 (3.7%) said was not available; improving acquisition or purchasing of external knowledge 143 (66.8%) available, while 57 (26.6%) not available; improving distribution of knowledge 184 (86.0%) of the respondents believed was available and 25 (11.7%) said it was not available; improving management of innovations 178 (83.2%) available, 30 (14.0%) not available; reduction of costs 110 (51.4%) claimed was available, while 84 (39.3%) believed it was not available.

The findings generally suggest that all the KM initiatives were available in the five agricultural research institutes. The implication of this finding is that the institutes’ knowledge and innovation management strategies are rich and well-grounded with a variety of initiatives, and this could facilitate the much-needed transformations in the Nigerian agricultural systems. Bijaya and Uday (2011), in a study carried out on KM initiatives in two information technology (IT) organisations in India, known as Net Centre and Web Centre, established four themes of KM initiatives that included knowledge creation, knowledge sharing, knowledge up-gradation and knowledge retention.

Ale, Toledo, Chiotti and Galli (2014) noted that knowledge sharing initiatives should take cognisance of organisational strategy such as balance between

social and technological KM aspects; change in the organisational culture; distributed KM; KM activities structuring; and organisational knowledge identification (consciousness). The findings of Ale *et al.* (2014) corroborate the findings of this study regarding the KM initiatives used in the institutes such as identification of existing knowledge, changing organisational culture and improving distribution of knowledge. The similarity may be due to the dominance of such KM initiatives in the literature where this study generated most of its variables.

Kim, Yu and Lee (2003) emphasise on improving organisational performance by identifying and leveraging knowledge directly related to business processes and performance. The findings of Kim *et al.* are at variance with the findings of this research, a fact that may be attributed to the fact that this study used an empirical design while Kim *et al.* used literature review. Kim *et al.* (2003) acknowledged that their study, being exploratory, could not be generalised and would have limited empirical validity.

Knowledge Management Best Practices Adopted

The respondents were asked to indicate the knowledge management best practices adopted in their institutes for efficient knowledge management. The findings are shown in Table 3 below.

Table 3: Knowledge management best practice adopted in the institutes

Community of Practice (N=211)				
Responses	Freq	%	Valid %	Cumulative %
Not adopted	87	40.7	41.2	41.2
Adopted	124	57.9	58.8	100.0
Missing value	3	1.4		
Total	214	100.0	100,0	
Community of Knowledge (N=207)				
Note adopted	91	42.5	44.0	44.0
Adopted	116	54.2	56.0	100.0
Missing value	7	3.3		
Total	214	100.0	100.0	

Findings of this study revealed that various knowledge-sharing best practices

were in place. For example, community of practice (CoP), as attested to by 124 (57.9%) respondents, was being used by the institutes to promote knowledge sharing. Community of practice is a forum where researchers working on a particular commodity/product engage in sharing of practices that lead to the actualisation, production and development of such a commodity or product. Community of practice consists largely of informal relationships between people who share common practices (Brown & Duguid, 2001, 1998; Lave & Wenger, 1991). Members of CoP typically spend time helping each other solve problems.

Furthermore, 116 (54.2%) respondents indicated that community of knowledge was one of the KM best practices in the institutes. Community of knowledge is a forum of knowledge workers drawn from various sections of the knowledge organisation for the purpose of knowledge exchange. A classic example is a cross-functional project team, where researchers from different sections, such as product development, marketing, product design, customer relations, form part of the process of developing a product or sharing practices based on their experience, from for example, trends in the market. The overall findings show that both community of practice and community of knowledge were used to manage knowledge and innovation in the institutes. This will have implications for increased knowledge production, sharing and dissemination to the country's agricultural research systems specifically and the agricultural sector as a whole.

Conclusion and Recommendations

The institutions seemed to invest more in personalisation strategy (human-based) than the codification strategy (ICT-based) as strategies for KM. There was also investment in community of practice, cross-functional project teams and mentoring, though to a lesser extent. The adoption of personalisation and codification strategies for knowledge sharing in Nigerian research institutes can be leveraged to stimulate the standardisation of the KM practices in the institutes. Furthermore, by using the strategies of KM (personalisation and codification) the research institutes seemed to be on the right path to repositioning themselves as knowledge production organisations in Nigeria's national economy. This could help bring transformation and revitalisation to the country's agricultural sector.

From the foregoing, the author recommends that since personalisation

strategy (human-based) through interaction and social networking in a non-IT environment was the dominant strategy used to derive research and innovations, compared to codification strategies (ICT-based), the institutes' organisational knowledge strategies should be transformed to the use of information technology so as to enhance the security, accessibility, efficiency, reliability and responsiveness of the knowledge management system for enhanced productivity and service delivery.

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The Impact of Knowledge Management on The Competitiveness of Insurance Firms in Kenya

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Abstract

The purpose of this chapter is to investigate and present the impact of knowledge management strategies on insurance firms in Kenya. The objectives of the study, that informs this chapter, were to examine the current knowledge management strategies used in insurance firms; analyse how the knowledge management strategies used have contributed to the competitiveness of the firms; determine the challenges insurance firms face while using knowledge management as a strategic tool for achieving competitive advantage; and to suggest possible solutions to the identified challenges. The study is a case study of UAP Insurance Company. Data were collected using interviews from 105 respondents selected through information-oriented purposive sampling. The data were analysed through descriptive statistics. The findings indicate that knowledge management strategies are being used as tools for gaining competitive advantage in the insurance industry in Kenya. The authors also reveal weaknesses in the management of knowledge in the insurance sector, and suggest that the industry should embrace structured knowledge management techniques. This will enhance their competitiveness and potential to remain relevant in the business world. The authors recommend that the insurance firms in Kenya should benchmark with other industries which already have established knowledge management systems to enhance their competitiveness.

Keywords: *Knowledge management, knowledge management strategies, insurance industry, competitive advantage, Kenya*

Introduction

Globalisation is currently affecting the competitiveness of many firms in the private sector. Consequently, many firms have focused in building their competitive advantage (CA) which is exemplified in terms of cost leadership, market differentiation, and niche orientation (Porter, 1985). The situation is graver because globalisation and technological advancements have eroded the traditional sources of CA forcing firms to seek alternatives (Jackson *et al.*, 2003).

One of the common approaches used to understand competitive dynamics is the resource-based view (RBV) of the firm. Jackson *et al.* (2003) argue that intangible resources are likely to generate greater competitive advantage in any competitive environment. These competitive assets include human capital which is usually the most important because it is the most difficult to replicate. Tangible assets have become easily accessible, replicable and substitute-able because of advancements in technology and other changes in the current business environment. Consequently, the foundations of organisational competitiveness have been sliding towards an emphasis on knowledge-based resources (Riahi-Belkaoui, 2003). These authors reviewed relevant issues in strategic management and knowledge management to draw a comprehensive picture of knowledge management capability-based competitive advantage of institutions.

Dalkir (2011) explains that hundreds of definitions of knowledge management exist in diverse scholarly and social literature. He further explains that knowledge management suffers from what he terms as the “Three Blind Men and an Elephant” syndrome in which every person defines it from their own perspectives leading to myriads and sometimes contradicting definitions. In this study knowledge management is defined as the multifaceted mix of strategies, techniques and tools which organisations, groups or individuals utilise to generate optimum value from their intellectual assets. Beijerse (1999) explains that the essence of knowledge management is to achieve organisational goals through strategy-driven motivation and facilitation of workers to develop, enhance and use their capability to interpret data and information. This can be achieved by using available sources of information, experience, skills, culture, and character. Thus, organisational knowledge management involves identifying, capturing, structuring, leveraging and sharing an organisation’s intellectual assets to enhance its performance and competitiveness. Earl (2003) argues that the core knowledge management practices in an organisation include leadership, knowledge capture and acquisition, training and mentoring, policies and strategies as well as communication and incentives.

Knowledge management is not only a collaborative and multidisciplinary process; it is also human centred (Brooking, 1999). Gery (1991) explains that knowledge management uses a “surprising mix of strategies” such as storytelling, peer-to-peer mentoring and techno-based knowledge systems, among others. Ruggles and Holtshouse (1999) further explain that the key attributes of knowledge management include generating new knowledge; accessing valuable knowledge from outside sources; using accessible knowledge in decision making; embedding knowledge in processes, products and services; representing knowledge in documents, databases and software; facilitating knowledge growth through culture and incentives; transferring existing knowledge into other parts of the organisation and measuring the value of knowledge assets and/or the impact of knowledge management.

Several scholars have proposed diverse dimensions to elucidate what knowledge is. One of these is the dichotomy between the tacit and explicit knowledge (Sanchez, 1999). Whereas tacit knowledge is perceived to represent the internalised un-codified knowledge, explicit knowledge represents knowledge that the individual holds consciously in mental focus, in a form that can easily be communicated to others (Alavi & Leidner, 2001). Nickols (2010) also argues that knowledge can also be implicit. He explains that this is knowledge which can be articulated but has not been articulated; it is implied or inferred from observable behaviour and performance. On the other hand, Hayes and Walsham (2003) propose a content/relational perspective of knowledge and knowledge management. In this school of thought, content perspective suggests that knowledge is easily stored because it may be codified; while the relational perspective recognises the contextual and relational aspects of knowledge which can make it difficult to share outside the context in which it was developed. Sensky (2002) proposes a distinction between embedded and embodied knowledge. He describes the former as knowledge outside a human individual and the latter as knowledge representing a learned capability of a human body’s nervous and endocrine systems.

Regardless of the perspectives outlined above, knowledge is perceived as a blend of experiences, insights, expertise, intuition and judgment that exist in the mind of the knower (Cheruiyot, Jagongo & Owino 2012); understanding gained through experience or study enabling an individual to perform a specialised task (Awad & Ghaziri 2007); fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information (Davenport & Prusak 1998); and subjective and valuable information that has been validated and that has been organised into a mental model used to make sense of the world and which typically originates from accumulated experience and incorporates perceptions, beliefs and values (Dalkir, 2011).

Knowledge management promotes combined and cohesive approach to identifying, capturing, evaluating, retrieving, and sharing an institution's information resources. Karadsheh *et al.* (2009) define knowledge management as a systematic process with activities to capture, create, filter, evaluate, store and share knowledge from individuals to advance business processes. Thus knowledge management is perceived to consist of strategies and practices for sharing and capturing experience as well as opinions within and around an institution. The results vary from institution to institution depending on the strategies used and their operational circumstances. These results support the institutions in varying extents to boost their competitive advantage. Although the focus on structured knowledge management processes is recent, the underlying principles of knowledge management have been around for a while (Alvesson, 2004).

Nonetheless, institutions have started to realise that depending on the strategies used, knowledge management can define their continued existence (Bukh, 2005). Therefore, it is imperative for institutions to consider knowledge management as one of the vital and unique processes which buttress their competitive advantage and build this business niche (Stewart, 1999). This is because knowledge is an important factor for success that institutions need to enhance their operations, services and products. It is no wonder, therefore, that progressive institutions currently invest more resources towards knowledge management. Nonetheless, it is important that the decision and the initiative on working with knowledge have a well-defined approach right from the top leadership down to the operation-level staff so as to generate the much needed competitive advantage (Alvesson, 2004).

Institutions always try to employ knowledge management strategies to possess competitive advantage over their rivals and boost their profitability (Hill & Rothaermel, 2001). An institution's advanced competitive position allows it to achieve profitability than the industry's average. An institution can achieve a higher profit over a rival either when it supplies an identical product or service at a lower cost or when it can supply a product or service that is differentiated in such a way that the customer is able to pay a premium price that exceeds the additional cost of the differentiation advantage (Porter, 1985).

Research Problem

Knowledge management employs a set of strategies and practices in order to capture, create, store, and share knowledge and experience within an institution. There are no clear and precise ways of how an institution should manage its knowledge. As such, there is no best or tailor-made procedure

or solution (Alvesson, 2004). This is because every institution is unique and exists in a unique context with its own culture, human resources, customers and competitors. Therefore, every institution should develop its own strategy for knowledge management and provide the resources needed to deploy it effectively (Alvesson, 2004).

Employees of insurance firms are highly specialised in various fields like general insurance, life insurance and medical insurance. It is these specialised skills and experiences which are applied by the companies to set them apart from their competitors. With the growth in the number of insurance firms as well as alternatives to insurance services, the competition for customers in the sector has increased exponentially. Therefore, most of the firms have embarked on strategies either to get or keep ahead of their competitors. One of these strategies is an investment in organisational knowledge management. This would enable the organisations to streamline operations, improve innovation and new product development, build closer ties with stakeholders, gather and make good use of business intelligence, enhance institutional memory, and increase profit margins. As the firms invest in knowledge management, they need to be aware of the potential impact and possible return on this investment.

This chapter therefore examines the current knowledge management strategies used by insurance firms; analyse how the knowledge management strategies used have contributed to the competitiveness of the firms; and explore the challenges the firms face while using knowledge management as a strategic tool for achieving competitive advantage. The authors also suggest possible solutions to the identified challenges so as to enable the firms to enhance the impact of knowledge management on their competitive advantage.

Methodology

The authors employed a descriptive research design. According to Imaana (2011) the descriptive research technique involves posing a series of questions to willing participants, summarising their responses with percentages, frequency counts, and other statistical indexes and then drawing inferences about a particular population from the responses of the sample. This research design was deemed appropriate for this study because the authors wanted to unravel the issues based on the perspectives of the respondents.

The study was conducted as a case study so as to gain in-depth data about the research issues. The case study used was UAP Insurance. The choice of UAP was based on its pre-eminence in the insurance sector in Kenya in terms

of coverage as well as the scope of services. The population of study was all employees of UAP Insurance in Kenya. Although UAP Insurance operates countrywide, this study targeted its regional headquarters in Nairobi with a staff population of around 350.

According to Orodho (2005), sampling is a technique where the researcher seeks knowledge or information about a whole population, objects or events by observing a sample, and generalising the findings to the entire population. A sample size according to Kerlinger (2000) should not be too large as it is a waste of resource while it should not be too small. It should be between 10% - 30%. The researchers selected a sample size of 30% of the total target population of 350 employees, thus $30/100 \times 350 = 105$ respondents. The actual respondents were selected through simple random sampling.

The authors collected both the quantitative and qualitative data from the respondents using questionnaires. This was done through a drop and pick method where questionnaires were first distributed to the respondents with a view of collecting them later. The method was convenient to both the researchers and the respondents since the respondents filled the questionnaires at their convenient time (Adeyemo, 2012). The researchers were also able to agree with the respondents on the appropriate time to collect the filled questionnaires hence making it easy logistically to collect the required information (Akuku, 2009).

Data collected were checked for completeness, accuracy and meaning. This was done in order to improve data quality through cleansing and correction of detected errors and omissions. It was then analysed through descriptive statistics. Qualitative data were analysed by categorising responses obtained according to the research questions and objectives of the study for content analysis. Descriptive statistics was used because it was simple to understand and easier to make the results known to a variety of readers (Kothari, 2004).

Findings and Discussions

When asked how KM techniques are applied at UAP, 35% of the respondents said it was through technology, 37% said through corporate communication and the remaining 28% said through mutual trust. This shows that corporate communication technique has the greatest impact followed closely by technology. The respondents were also asked to give their opinion on how knowledge management strategies are best applied at UAP. The majority of the respondents (28%) said it is best applied through workshops. The

other strategies identified included organisational communication (27%), organisational policies (26%), and team building (19%). Asked about the impact of these strategies, the majority (37%) said they have impact on corporate communication, 35% said the strategies impact the choice and use of technology while 28% were of the view that the strategies have an impact on mutual trust in the firm. These findings indicate that the knowledge management practices applied by UAP have had an influence on important aspects of the organisation's work and staff.

The authors also probed the general assessment of the knowledge management techniques at UAP insurance. Twenty nine per cent of respondents felt the techniques applied were excellent while 35% felt they were good; 27% of them said they were moderate while nine (9%) respondents held the view that the techniques were bad. The findings imply that more than half of the staff were comfortable with the knowledge management techniques applied in the company.

On the importance and impact of knowledge management to the company, 25% of the respondents were of the view that improved processes were a direct result of good knowledge management practices while 26% said they have enhanced competitive advantage. Another 25% felt that innovation was being brought about by the good knowledge management practices while the remaining 24% viewed knowledge creation as the biggest gainer from the knowledge management practices in the firm. Assessing the extent of impact, the majority of the respondents (32%) were of the view that it has been "great" while 27% thought it has been "very great". This implies that more than half (59%) thought the impact has been significant. Another 25% thought it was moderate while 16% thought the impact was little. It can thus be concluded that knowledge management practices at UAP have had a big impact on its competitive advantage in the market.

Challenges Faced by UAP in Knowledge Management

Respondents were asked to identify some of the challenges UAP employees are experiencing in knowledge management. The majority of the respondents (41%) identified individual's personality as a challenge hindering knowledge management efforts in the organisation; 32% of them associated these challenges with information and communication technology. The remaining 27% linked the challenges to bureaucratic leadership. Thus, it was evident that the knowledge management challenges UAP faces are human. This underscores the role of employees in knowledge management efforts. The firm should work to motivate the employees to readily share and learn as a means of improving its knowledge management status.

Recommendations on Knowledge Management Enhancement at UAP

The respondents were asked to make recommendations to alleviate the identified challenges. The respondents provided the following recommendations:

1. 33% recommended an improvement of the organisational culture to make it more facilitative of learning and sharing of knowledge than it is now;
2. 32% proposed an improvement of the technological infrastructure in the firm to make it adequate to support effective knowledge management; and
3. 35% recommended the improvement of the employees' individual commitment to knowledge management initiatives through a combination of appropriate rewards and incentives.

The researchers also make the following recommendations:

1. The insurance industry in Kenya should benchmark with the other industries in Kenya and beyond so as to share best practices in knowledge management.
2. The sector should encourage the creation of new knowledge by developing a safe working environment which facilitates the workers to experiment without the fear of being reprimanded or sacked if they make mistakes. Essentially, the organisations should make it easy for their staff to make safe mistakes which may result in new knowledge.
3. They should also recognise and manage the diverse interests of all the stakeholders to minimise resistance to knowledge management projects and activities. This may also imply involving as many stakeholders as possible in planning, designing and implementing knowledge management programmes.
4. The companies in the insurance sector in Kenya should also identify and mitigate knowledge management risks promptly. This can be achieved through comprehensive planning of projects and implementing new knowledge management systems in phases.
5. Although the insurance firms in Kenya compete against each other, they should seek opportunities to collaborate, network and build alliances which promote sector-wide knowledge creation, sharing and learning.

Conclusion

Insurance firms in Kenya have embraced knowledge management as a means of enhancing their competitive advantage. Similarly, their knowledge management initiatives have had a significant impact on their competitiveness. Nonetheless, the firms face several challenges that hamper the impact of their knowledge management projects. The greatest of the challenges is the lack of adequate commitment of individual employees in supporting learning and sharing of knowledge in the firms. Therefore, the firms should develop incentives to motivate their staff to learn and share knowledge freely. These findings demonstrate that knowledge management is a critical factor in competitiveness of private companies. They also assert that human resource is one of the greatest assets in knowledge management.

Practical Implications

The findings of this study can be used by private firms in Kenya to employ knowledge management more meaningfully to their competitive advantage. They may also be used to demonstrate the value of knowledge management in enhancing the capacity of private firms to survive in an increasingly competitive environment. These findings may also be used by knowledge management practitioners working in the private sector to select the strategies and techniques which are likely to generate a higher impact for their firms.

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Enhancing Organisational Performance in Kenyan Universities Through Effective Tacit Knowledge Management

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Abstract

Knowledge is an important asset and tacit knowledge is located in the minds of people. To succeed, organisations have to make the best use of their knowledge assets. This can be achieved through diverse initiatives such as mentorship programmes, team learning and development, communities of practice, development of knowledge sharing platforms, storytelling and enhanced channels of communication. Universities, just like all the other organisations must strategically respond to the current developments in the knowledge society and specifically in the management of tacit knowledge assets. This chapter reviews literature on tacit knowledge management to unravel how universities in Kenya manage and utilise their tacit knowledge to improve organisational performance, as well as the challenges they face in this process. The authors propose a tacit knowledge management framework for consideration by universities in Kenya and beyond. The authors reviewed literature on tacit knowledge management in relation to universities in Kenya. They specifically analysed documents on the strategies for managing tacit knowledge as well as the challenges hampering their effectiveness. Well defined organisational strategies, good leadership, knowledge sharing culture, mentorship, communities of practice and customised technology are seen to be catalysts of tacit knowledge management. While, the lack of incentives and rewards, insufficient mentorship programmes and lack of recognition of human capital inhibit tacit knowledge exploitation which negatively influences organisational performance. The authors established critical contributions of tacit knowledge management on organisational performance. These findings may be used to support relevant policy development in academic institutions. Universities may also benefit by implementing or adapting the proposed tacit knowledge management framework.

Keywords: *Knowledge management, tacit knowledge, organisational performance, universities, Kenya*

Introduction

Universities have substantial opportunities to integrate knowledge management initiatives in their institutions to support their mission (Kidwell *et al.*, 2001). Tacit knowledge management activities can be put in place to contribute to the organisational growth and development. Currently, knowledge has become a critical resource for growth and survival in all spheres of life. Countries are able to rise in their socio-economic realm because proper management of knowledge resources provides for low-cost and effective ways for service provision and production of goods (World Bank, 2012).

Tacit knowledge management is the management of individuals with specific know-how. The most important feature of tacit knowledge is the fundamental principle that knowledge is individualistic in nature; it is not easy to extract it from the heads of individuals (Sanchez, 2012). Kwanya (2009) explains that tacit knowledge is personalised and contextualised. Although appropriate management of tacit knowledge enhances organisational performance, not much is known about the management of this resource (Pathirage, Amaratunga & Haigh, 2007). Botkin and Seeley (2001) revealed that 80% of the organisational knowledge is tacit and therefore forms a very important component of the organisational memory. While tacit knowledge is credited for all its potentials and values, its management has not been fully implemented.

The creation and dissemination of knowledge has long been the social role of universities. It has been mentioned that when people leave, their knowledge leaves with them (Pickett, 2004). This chapter has the potential of helping universities to adapt strategies of capturing tacit knowledge before people possessing this knowledge leave the institution. Managing knowledge assets in universities needs to be a daily agenda. These knowledge assets include people (human capital) because a significant proportion of an organisation's knowledge assets is often stored in the minds of its employees; knowledge artefacts (organisational capital) including video tapes, DVDs, databases, books, memos, business plans, manuals, patents and products; structural and procedural assets (organisational capital) manifested in an organisation's actual behaviours such as culture, infrastructure, purpose and strategy; and customer relationship (customer capital). Academicians are a reservoir of tacit knowledge which needs critical management. The authors have examined literature on tacit knowledge management elements, the challenges hampering knowledge management and the impact of tacit knowledge

management. They then propose a framework for managing this important form of knowledge in universities.

Methodology

Using documentary analysis, the authors reviewed literature on the general areas of knowledge management to have a general understanding. Further review was done on tacit knowledge management in organisations and narrowed down to universities in Kenya. A number of factors in tacit knowledge management were explored by means of insightful literature review in order to conceptualise tacit knowledge by identifying components that support tacit knowledge management. In view of this, a new framework for tacit knowledge management is proposed for the universities. Literature was obtained from electronic databases, Internet sources, textbooks and peer reviewed journal articles and publications.

Findings and Discussions

The findings of the study are presented and discussed hereunder.

Knowledge Management in Kenya

The Kenyan government believes in the role of incentives in promoting exploitation of tacit knowledge (GoK, 2007). Many countries in the Sub-Saharan Africa have failed to integrate knowledge management in their operations because knowledge has not been fully embedded despite the presence of ICT policies (Ondari & Minishi-Majanja, 2007). Universities in Kenya are not an exception. The value of ICT has not been fully realised because Kenya has not utilised the potential of technology in development. This is explained by the World Bank's knowledge assessment framework (Ngulube, Shezi & Leach 2009) which noted that the performance of Kenya is below average. According to the frameworks' parameters on education, innovation and ICT, Kenya scored 1.83%, 4.18% and 2.28% respectively (World Bank, 2012). It is worth noting that Kenya is performing poorly especially in education, innovation and ICT by scoring below average in a scale of 1-10.

Tacit Knowledge Management

Tacit Knowledge (TK) is a type of knowledge that cannot be easily expressed because it is engraved in an individual's experience, ideas, values and emotions (Foos, Schum & Rothenberg, 2006). This chapter defines tacit knowledge as knowledge developed and constructed by people which is then shared through social processes.

Poor management and lack of the realisation of the value of tacit knowledge causes a challenge to an institution which would want to remain competitive. This mismanagement of tacit knowledge necessitates a deeper understanding of the construct so that it can be managed competitively to improve performance. Newly created tacit knowledge as well as existing knowledge gets lost through high rate of staff turnovers, retirement, transfers, redeployment, job-hopping, poor organisational culture of sharing, and lack of knowledge management systems, among other contributing factors.

A study of 240 organisations in the United States by Frank, Finnegan & Taylor (2004), indicated that 78% of the lost knowledge resulted from employee turnover. In addition, Kransdorff (2003) reports that losing corporate memory from employees is very expensive. As a result of this knowledge loss, organisations become deficient in managing their knowledge work activities which leads to inefficiency. Retaining knowledge within the organisation is important for competitiveness (Bender & Fish, 2000).

Organisations (irrespective of the sector of economy and size) are faced with tacit knowledge management challenges (Stam, 2009). Preservation of this important resource is susceptible. To ensure tacit knowledge continuity, organisations should devise strategies to reduce this loss. Tacit knowledge, therefore, should not be looked at as an object but instead as a valuable asset created from different knowledge platforms within the universities. There is need to explore tacit knowledge management strategies to ensure business continuity, and by ensuring tacit knowledge continuity the universities can develop competitive advantage through improved performance. Knowledge continuity ensures competitiveness for organisations (Strack, 2008; Stam, 2009), their management and employees.

Scholars and authors in knowledge management literature have identified elements and strategies for the utilisation of tacit knowledge and its management. Others have provided recommendations on the proper management of tacit knowledge after realising its potential benefits. This is displayed in Table 1 below.

Table 1: Tacit Knowledge Management Strategies

Author	Tacit knowledge management strategies
Mungai (2014)	Communities of practice; organisational culture; technology; leadership and organisational processes.
Runyenje (2012)	Tacit knowledge preservation.
Kimile (2012)	Tacit knowledge sharing culture.
Ogare and Othieno (2010)	Converting human capital (tacit knowledge) into structural capital (explicit).
Mosoti and Mesheka (2010)	Organisational culture; organisational strategy and organisational leadership.
Wangari (2009)	Organisational and knowledge strategy.
Ragins and Verbos (2007)	Clear vision and strategy.
Kimile (2006)	Integrating knowledge management technology and communities of practice.
Herbert (2000)	Tacit knowledge is a major asset for competitive advantage.
Darwin (2000)	Mentorship programmes - enhance professional and career development through transfer of knowledge, skills, values and attitudes from a senior staff to a junior colleague.

Challenges in Tacit Knowledge Management

Tacit knowledge management is faced by a number of challenges as illustrated in Table 2 below.

Table 2: Challenges of Managing Tacit Knowledge

Author	Challenges of tacit knowledge management
Wamitu (2016)	Lack of attention to tacit knowledge; tacit knowledge is lost as a result of retirement and lack of trust.
Gitonga (2016)	Unfit mentor-mentee match and ratio; work overload; shortage of qualified staff; lack of support from mentors and institutions; inadequate time for mentorship; lack of recognition of mentors; unfitting personality traits; communication difficulties, and external interruptions.
Cummins (2004)	Low incentives (financial and non-financial); inadequate infrastructure and difficulties in capturing tacit knowledge.

Knowledge Management Frameworks/Models

The authors identified the gaps in the frameworks that can positively contribute to tacit knowledge management. It is important to note that tacit knowledge is not visible enough yet it is an asset in knowledge management. A summary of available knowledge management frameworks in the knowledge management literature is provided in Table 3.

Table 3: Knowledge management frameworks/models

Name	Author	Model	Gaps and success factors
Knowledge-Based Theory of a Firm.	Kogut and Zander, 1992.	Emphasised the strategic importance of knowledge as a source of competitive advantage.	Focused on knowledge creation and transfer. It didn't look at how to create a conducive knowledge creation environment.
Karl Wiig KM Model.	Karl, Wiig 1993.	Marks the basic principle which states that in order for knowledge to be useful and valuable, it must be organised and synchronised.	The how to organise and synchronise knowledge is missing, IT can be used to support this function. Policies, organisation structure, and good leadership practices are also important.

<p>Hedlund and Nonaka's Knowledge Management Model</p>	<p>Hedlund and Nonaka 1993</p>	<p>Describes four levels of carriers or agents of knowledge in organisations. These four levels of 'carriers' perspectives assume that knowledge is categorised into the individual, the group, the organisation and the inter-organisational domains.</p>	<p>This provides a clear indication that a good organisational culture should be created to promote organisational learning processes. The model suggests that the essence of organisations' survival and success can depend on how they create, transfer and exploit their knowledge resources.</p>
<p>SECI Model of Knowledge Conversion</p>	<p>Nonaka and Takeuchi, 1995.</p>	<p>The model displays four different modes of knowledge conversion (Socialisation, Externalisation, Combination and Internalisation)</p>	<p>After creating tacit knowledge from socialisation and internalisation processes, the framework doesn't provide a component of retention/storage/preservation. Aspects of the management function are missing.</p>
<p>Organisational Epistemology.</p>	<p>Von Krogh and Roos Model, 1995.</p>	<p>It is the first model that precisely differentiates between individual knowledge and social knowledge.</p>	<p>After the distinction, the handling of this knowledge types is not mentioned. Taking care of the human and organisational capital should be key.</p>
<p>Skandia Intellectual Capital Model of KM.</p>	<p>Skandia 1997.</p>	<p>The model focuses on the importance of equity, human, customer and innovation in managing the flow of knowledge within and externally across the networks of partners.</p>	<p>The model ignores the political and social aspects of knowledge which are very critical in tacit knowledge management. This gives an emphasis on measurement.</p>
<p>Sense-Making KM Model.</p>	<p>Choo, 1998.</p>	<p>Focuses on sense making, knowledge creation and decision-making skills.</p>	<p>It does not illustrate how knowledge is shared and used.</p>

<p>Boisot's Knowledge Diffusion Information Space Model</p>	<p>Boisot, 1998.</p>	<p>It is a model for knowledge asset development. The model introduces an extra dimension 'abstraction' to Nonaka's SECI model. The model emphasises that knowledge can be generalised to different situation.</p> <p>It can be seen as a three dimensional cube with the following dimensions; from uncoded to codified; from concrete to abstract; and from undiffused to diffused.</p>	<p>The model is very critical in the identification of knowledge assets in the organisations. This therefore directs the authors to identify knowledge audit as an important component of TKM which has not been identified by other models and also not mentioned in the literature.</p>
<p>Demerest's Knowledge Management Model.</p>	<p>Demerest, 1999.</p>	<p>Demerest's KM model emphasises the construction of knowledge within an organisation.</p>	<p>Does not focus on external collaboration.</p>
<p>KM Enabling Factors.</p>	<p>Stankosky and Baldanza, 2001.</p>	<p>KM enabling factors include learning, culture; leadership; organisation and technology.</p>	<p>The model discusses KM enabling factors in general. The specific sub-elements of these major elements were not mentioned. Some key factors like mentorship and knowledge audit are missing.</p>

<p>Wenger's Communities of Practice.</p>	<p>Wenger, <i>et al</i> 2002.</p>	<p>Wenger, acknowledges that there is explicit as well as tacit knowledge and also concludes that explicit knowledge however important, is dependent on tacit knowledge to be applied. This knowledge is not static and sharing tacit knowledge requires interaction and informal learning processes. CoPs provide such a platform through activities such as coaching, apprenticeship, storytelling and conversation where knowledge is codified. It facilitates tacit knowledge sharing.</p>	<p>Does not look at the platforms or enabling technologies to facilitate the knowledge sharing process. Elements like coaching, apprenticeship, storytelling to be made visible from the model since they are very crucial in knowledge sharing.</p>
<p>Frid's Knowledge Management Model</p>	<p>Frid, 2003.</p>	<p>This model states that KM maturity assessment levels and KM implementation can be divided into five levels; Knowledge chaotic; knowledge aware; knowledge focused; knowledge managed; and knowledge centric.</p>	<p>It points out the need for KM policies, training and awareness sessions for a successful KM project.</p>

The literature reviewed made it possible for the authors to propose a model for use in the management of tacit knowledge in universities.

Components of the Proposed Tacit Knowledge Management Framework

The framework is a guide to tacit knowledge management in terms of tacit knowledge management components. These components are leadership, organisational culture, enabling technology, mentorship and knowledge audit. If these components are integrated in the institution's operations it may lead to tacit knowledge creation. This knowledge can then be made accessible for use and reuse to ensure business continuity, tacit knowledge continuity, and hence improved organisational performance and competitive advantage. These may be realised through innovation, quality products and services, organisational learning and profitability.

Leadership

An effective leadership is paramount to the success of any organisational activity. Leadership support will create an environment conducive for tacit knowledge management. Good leaders ensure there is an efficient style of communication, provide a system of rewards and incentives to encourage tacit knowledge sharing, measure performance (reward good performance and discipline poor performance), ensure a flexible and stable organisational structure as well as develop and implement tacit knowledge management policies. Leadership is a complex multifaceted process perceived as a set of values, qualities and behaviours exhibited by the leader that encourage the participation, development, and commitment of followers. Leadership is also considered as the art of influencing others in a particular direction that involves casting a vision, goal setting and motivating people (Spendlove, 2007).

In many universities in Africa, leaders are not recruited for their leadership potential, but rather are nominated and rewarded for their research and teaching. Vice chancellors, deans, directors, and deans of departments in universities in Africa are often appointed based on academic qualifications, and rarely receive critical training in strategic planning, budgeting, human resource development and faculty management (Sifuna, 2012).

Appointments and promotions within the universities is a very contentious issue in tacit knowledge management. Universities breed knowledge intensive firms through skills development, research and innovation. Appointment of unqualified personnel, uncommitted or misplacement of expertise will negatively contribute to tacit knowledge management. The 'moonlighting'

(engaging in other income-generating activities) syndrome in Kenyan universities, the use of old teaching notes, zero research-based teaching and learning, a lack of commitment in the mentoring of students and lack of motivation (Waswa & Katana, 2008) hamper tacit knowledge management.

As noted in a contribution by a senior academic in one of the public universities:

“...A good number of us in the university know the rot within, but have selected either to remain silent or join the rot. The process of recruitment of academic staff in some of our universities has been abused to the point where interviews are held to justify already decided appointments. Why is it that someone is recruited into the university academic staff without submitting a CV for scrutiny among staff and students? Future appointments to university academic staff must require applicants to present a seminar paper before staff, students and interested public. Promotions are another area where consistency is lacking. We have colleagues in the university who have been promoted to senior positions, but whose CVs do not show a record of serious research and publications. A lecturer whose CV lists newspaper articles and articles in non-peer reviewed journals as publications is an embarrassment. When you have senior lecturers whose CVs do not have at least five peer-reviewed book chapters/ journal articles, it must be asked who in the university leadership promoted them. The process of aligning university education to the new constitution must clean up university management, streamline management structures and weed out scholars who are surviving through patronage. We owe this to our students...” (Murunga, 2012:16).

The proposed model has identified the following key elements on leadership: management support; communication style; open rewards and incentives system; performance measurement; flexible organisational structure; open management style and tacit knowledge management policies. These elements have the potential to alleviate leadership problems that undermine the tacit knowledge management efforts in Kenyan universities.

Organisational Culture

A good organisational culture supports socialisation through team work, solidarity, organisational learning and creation of communities of practice. Such a culture in turn nurtures trust where employees can share experiences through storytelling and hence enhance tacit knowledge sharing. Rigid organisational culture breeds unwelcoming work environments. In such

circumstances, there is rigidity by personnel to socialise and work together as team members. It is noted that faculty members would collaborate with other members of staff in other universities to do a research paper, but internal collaborations are unpopular.

Mentorship

A mentorship programme facilitates the transfer of knowledge, skills and values from experts to non-experts for professional and career development. The experts nurture the young talent in the organisation hence fostering continuity. Mentor-mentee relationship that occurs within an organisation, profession or occupation supports a learning collaboration between or among the parties involved. Such a strategy can help universities manage their tacit knowledge. Mentorship should be formalised and periodically reviewed to measure its success.

Tacit Knowledge Audit

A knowledge audit is a process that allows an organisation to know what knowledge exists, who has it, where it is, how it moves and how it is managed. A knowledge audit would be important because it can help an organisation to identify tacit knowledge assets, the tacit knowledge gaps, as well as review the use of internal tacit knowledge assets, their value, and how they may be improved to develop a tacit knowledge map for the organisation.

Technological Infrastructure

A technological infrastructure is a platform that supports the creation, capture, development, processing, preservation and sharing of tacit knowledge. Proper hardware and software facilities should be put in place in support of tacit knowledge management. Besides, right procedures, policies and guidelines should be implemented. Identifying and installing the right technological platforms and accessories for tacit knowledge management is important. Technology for managing tacit knowledge should allow for maximum interactivity to facilitate full utilisation, exploration and exploitation of tacit knowledge resources. Training and awareness forums should be made practical to ensure maximum utilisation.

Tacit Knowledge Generation/Creation/Capture

Tacit knowledge can be generated after integrating and interweaving leadership, organisational culture, mentorship, knowledge audit and technological infrastructure in the organisation. Tacit knowledge can be tapped and preserved in knowledge banks. The tacit knowledge harnessed will then be used for development of new products and services, research and innovation and business process reengineering.

Tacit Knowledge Use

Utilisation of tacit knowledge ensures there will be business continuity, tacit knowledge sharing, competitiveness and improved organisational performance.

Conclusion

It is evident that tacit knowledge is a key asset to the growth and development of an organisation. To remain relevant, universities and other organisations alike must nurture this important asset. Most organisations pay attention to tangible resources and overlook the intangible resources. The realisation of the value of tacit knowledge to the performance of universities is mandatory. Setting the knowledge priorities right is a critical strategy to be adopted by universities.

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Section Three: Indigenous Knowledge

Enzymes, Ants, Chapatis and Weeds: Figuring Out How to “Manage” “Indigenous” “Knowledge”

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Abstract

In order to stimulate discussion and introspection about the many issues related to the management of indigenous knowledge, the author builds on earlier publications and examples drawn from nearly five decades of participant observation in Kenya. Consideration is given to the historical conflict in attitudes toward the management of knowledge in general during pre-colonial, colonial and post independence periods. Culture-based systems and their caretakers have faced intrusion and misappropriation by self-interested parties while vast bodies of knowledge have been lost as the generations that held that knowledge have expired. Plans for the management of indigenous knowledge need to consider the full range of stakeholders and changes in its applicability over time. Examination of categories and dichotomies of indigenous knowledge and modes of collection, expression, storage and dissemination can inform the small and large-scale planning and implementation of indigenous knowledge management. This chapter presents some of the questions and dilemmas which stakeholders seeking to effectively manage indigenous knowledge need not only to be aware of but also attempt to address. These questions revolve around the real meaning of indigenous knowledge as well as its ownership, value and applicability in a fast changing generation.

Keywords: *Indigenous knowledge, data collection, data storage, East Africa, Kenya, traditional knowledge*

Introduction

This chapter is more about questions than answers. It builds on earlier publications (Pido, 2016, 2015, 2001, 1994, 1993, 1983; Pido & Pido, 2015; Pido *et al.*, 2002) and examples drawn from nearly five decades of participant observation in formal and informal settings in Kenya. Some of the crucial issues related to indigenous knowledge and how it has been, is and can be managed are definitional. Some are situational while others are universal. Nonetheless, in the plans for identifying and managing indigenous knowledge, individuals, families, communities and nations must be prepared to negotiate a complex set of paths in order to do the best service possible to future generations. Not

the least of the many concerns surrounding the management of indigenous knowledge is ethics. As entry points into this labyrinthine subject, let us examine four illustrative vignettes and try to answer the questions they raise:

Vignette 1: Wild plant, enzymes and cholesterol

There is a plant that grows wild in many parts of East Africa. It contains an enzyme that breaks down cholesterol when consumed in food. Indigenous peoples have many uses for this plant but they do not know that part of its efficacy is connected to cholesterol nor do they know about the enzyme unless they have the relevant medical training. Even the medically trained do not necessarily make the connection between the two. The author learned of the connection from a fellow American indigene in New York City. How shall I manage my learned knowledge of the plant combined with my indigenous American knowledge of the enzyme and my cholesterol level? Shall I keep it a secret or share it with everybody through a book, an article or a post on social media? Shall I place it in a password-protected archive or make it a secret only for women? Shall I form a non-governmental organisation or a religion to promote its use? Shall I sell it to a drug company? Please, note that I have neither told the reader the name of the plant in any language nor shown a picture of it. I have also not explained how to cook with it. The big question is: am I acting ethically?

Vignette 2: Flying ants as indigenous food

Flying ants come out after a rain. People from Western Kenya know how to catch them in huge numbers, fry them and munch on them or pound them into a paste and put the paste in food. For an American in Kenya, my indigenous knowledge places the paste, like peanut butter, on bread with jam. In a place where the indigenous knowledge does not include catching, cooking and eating flying ants because they are not believed to be food, should the people there be introduced to the deliciousness of flying ants? Or should the people who have this knowledge eat the ants all alone? Do the holders of the knowledge classify the local people as a lower form of humanity because they do not eat flying ants? Would it be ethical to force children from this community to eat flying ants at boarding school if that goes against their culture?

Vignette 3: Kenyan versus Indian chapatis

A black Kenyan friend was invited to a party in the United States. Everybody was supposed to bring a dish from their own national tradition. My friend made chapatis (a type of flat bread). The Indians and Pakistanis at the party laughed heartily and explained that chapati is Indian, not African. How indigenous or exotic is the complex body of knowledge that surrounds the chapati? If chapatis are not indigenous, why do we have debates about coastal roll and upcountry roll? Is the debate worth having? Should it be recorded? Who invented the two kinds of roll and what has happened to both of the rolls in the culture of fast-food kiosks? Can exotic knowledge be indigenised and if so, how? How long does it take and how should it happen?

Vignette 4: Edible plants and food shortages

In the early 1990s, there was a team consisting of an American and a Kenyan who were sent by an organisation, long forgotten by the author, to collect information on edible plants that people in Kenya resort to eating only when there are food shortages. These would be the plants that people do not ordinarily eat but can do so if the only alternative is starvation. They toured the country interviewing people and collecting names and samples of plants that may be needed at some point in the future by generations that may have forgotten their very important use. Can the collection be comprehensive? Where were the list and the samples deposited? How are they being preserved? Has the information contained in the research been disseminated? How can the list be accessed today and for how long will it be available? Did the team find any indigenous plants that are edible but not known to the local people where they grow? Did they test their samples to make sure that nobody was lying and putting in poisonous plants?

Dilemmas in Indigenous Knowledge and Its Management

If we were to rank the indigenous knowledge referred to in the vignettes above, which ones are likely to be considered as more important and which are less important? To whom? For what purposes and why? Should they be preserved or discarded or just allowed to fade into the realms of the forgotten? Who needs or wants them now and who will or will not need or want them in the future? If we consider the plight of the research biochemist who cannot feed himself without having a wife to make his chapatis, or the starving family whose grandma never told them they could eat certain weeds or flying ants, where can we go with the concepts and considerations in the management of “indigenous knowledge”?

People living in Kenya in the 21st century are victims of three major negative factors in the history of this region. One, was the persistence of slavery which created a culture of self protection through concealment; second, was the absence of the use of writing among East African peoples prior to the third negative factor which was the colonial incursion and subsequent colonisation. Every idea we have now and every strategy we may develop is coloured by the cataclysmic experience of at least five indigenous generations who were out-technologised by exotic forces.

While in the past the use of writing depended on paper and cumbersome means of storage and dissemination such as letters, files, articles, books, we are now in a new world of digital collection, storage and dissemination – for as long as we have electricity and the necessary equipment. The collection and conservation of verbal, musical and pictorial information is much easier now. Storage capability has expanded exponentially thus enabling the preservation of infinitely more detailed and extensive bodies of knowledge. Sharing and dissemination of knowledge are now truly global, while reservation, limitation and denial of access become increasingly obsolete and difficult every day. Categories of knowledge are collapsing as YouTube and other websites enable everyone to tell each other what they think others may want or need to know. In people like Arap Yego, Kenyans have a perfect example of an indigene from a community with a long history of using spears as weapons now self teaching the ancient Greek tradition of javelin throwing on YouTube and becoming a world champion in that sport. All knowledge now becomes democratised over time and space. In fact, universities may become redundant outside their laboratories, studios and workshops.

Rationale of The Study

One of the biggest questions people living in the 21st Century are asking is why they should consider the category of knowledge called “indigenous”? For the sake of bringing order to the complex set of questions that arise around the management of indigenous knowledge, let us arbitrarily turn to the journalistic “5 Ws and H”: What, Who, Where, When, Why and How. The vignettes discussed earlier, chosen from memory when the author was hungry, offer many examples of some of the complexities and contradictions in identifying and planning for management of indigenous knowledge.

What is “Indigenous Knowledge?” How are we to define the terms “indigenous” and “knowledge”? Is the author’s knowledge of the enzyme, received from a fellow indigene, indigenous to America? Is knowledge

generated in a laboratory indigenous to the country where the laboratory is located or linked to the ethnicity of the person who generated it or the institution or company that financed its discovery? Is the term “indigenous” a euphemism for something else? Could it actually be referring to knowledge that has not yet been written or recorded as sound? What is the time factor in indigenous knowledge? Is the knowledge of an older generation more or less valid than that of a younger one or are they equal in importance? What are the processes of indigenisation and how can we take them into account in information management? Can anybody set guidelines on the adoption, acceptance and reworking of an exotic element to make it indigenous? The chapati is a case in point, originally from south Asia but incorporated, changed, embellished and reworked in East Africa to the extent that the Asian and East African versions are strikingly different - to those who know or pay attention. Should we be documenting the history of the chapati in Kenya? What form should “management” take? Will it be by legislation at national, county and local levels? Will it be ad hoc and individualised? Will anyone continue to observe boundaries of ethnicity, religion, gender, generation or occupation in the collection, storage and dissemination of indigenous knowledge? What can be done to foster and develop a culture of information sharing in a nation state with a long history of reservation and segregated access?

Who are the stakeholders in the management of indigenous knowledge? Who is to be credited with the creation and generation of indigenous knowledge? Who owns it? Who needs it? Who wants it? In the digital age, can any single person or group truly own it? Who decides who else can have access to indigenous knowledge? Who are the economic stakeholders in the knowledge of how to catch and cook flying ants? Who cares about the different and contentious ways of rolling out a chapati? Hoteliers and restaurateurs are, as is the woman who is ridiculed by her peers or is being beaten because her husband does not like her chapatis. She is a major stakeholder in the indigenous knowledge of the chapati. Carrying the “who” question further, we can pose many challenging questions for discussion, examination and analysis.

When – how far back does indigenous knowledge go? Wilderness survival experts are now teaching us that we can survive by using chipped stones to cut up a rotten carcass and making soup from the maggots. If our very distant ancestors had not known that, we would not be here today. They also ate forage plants that we no longer recognise as decent food and have mostly forgotten that we can eat them during hard times. When did the

chapati become indigenous food in East Africa? Does anybody remember the time before Irish potatoes? Does the fact that Irish potatoes are exotic make “kienyeji” (local Kenyan food made from mashed Irish potatoes, beans, maize and pumpkin leaves) any less indigenous? What about tea? What about pizza? Do we need a new category of knowledge called ‘indigenised?’ When will we have enough of stored indigenous knowledge? When will it be exhausted? When will the storage system crash? When does indigenous knowledge become dysfunctional? In many Kenyan communities young males are taught that they should defy all risk and forge ahead even though their lives are in danger. Likewise many young men go through indigenous training programmes that emphasise negative behaviour toward members of the opposite sex. This brings to fore the question about when indigenous knowledge should be discarded or replaced.

Why should we be considering the collection, storage, analysis, verification and dissemination of indigenous knowledge? One answer is why not? Another is, because we can. Yet another answer is, because we need it. Another is because so much has been lost and we will lose the rest at our peril. As the HIV/AIDS epidemic wiped out a generation in Eastern and Southern Africa, it became clear, especially in Uganda and Malawi, that children were being orphaned before they were old enough to have received adequate knowledge of their subsistence systems from their parents. The grandparents were often too old or too overburdened to transmit the fine details of their cultures to the children. This also happened in Western Kenya where a generation of clan “elders” under the age of 30 had to take over the management of the community from the older men and women who had died. This can happen again, and, if nothing else, it should be an important factor in community-based efforts to collect, record and store indigenous knowledge.

Going back to the vignettes above, we can now ask just how important it is for people to know that they should be conserving the stands of the enzyme plant and continue using it as their forebears did in spite of modernisation exemplified by packaged foods and the rejection of their original diet. Should not everybody be informed of the efficacy of this plant and should we not try to figure out ways to include it in everybody’s menu options?

How can we gather indigenous knowledge, store it, disseminate it taking various stakeholders’ interests into account? How will we deal with the necessary integration of the written word with oral, auditory and kinetic knowledge? How will we integrate indigenous knowledge and systems with exotic knowledge and systems? How will we deal with issues of

privacy, secrecy, generation lock, gender lock, ethnic lock, religious lock and occupational lock at the personal, family, local, county and national levels? A case in point is about occupational lock. Already, healthcare professionals face patients who have looked up their symptoms on the Internet and who present themselves with a description of the diagnostic options they think the clinician should consider. How will anybody deal with selectivity and forgetfulness? People tend to remember and report that which is favourable to them. Small details of the moment may become important data later on. Note that the author of this chapter cannot recall the name of the organisation that sent the team of researchers to collect edible wild plants as recently as the 1990s.

Discussion

As an American anthropologist, the author is heavily influenced by the early theorists who realised too late that vast bodies of indigenous knowledge had been lost as exotics overran the indigenes in the Americas between the 16th and 20th centuries. As the academic discipline called Anthropology took form, concerned researchers set about a massive “salvage” exercise in the collection of data on the life ways of the few Native Americans who had survived the onslaught and the slaughter. They were trying to collect information that had largely been lost with the dead from people who had been grossly traumatised by the brutalisation of their persons and their ways of life before they were even born. It should be no surprise that a social scientist who grew up with the understanding that everything should be collected, recorded and stored would advocate massive data collection from the elderly and knowledgeable people in every part of Kenya and from all walks of life. Archival research into indigenous knowledge is absolutely necessary but may not be as rich in information as we would wish.

Finally there are issues of completeness, accuracy, correctness and ethics. We must be able to get the truth, the whole truth and nothing but the truth, without harming anybody or setting anybody up for harm in the future. Here are some examples: There is the challenge of unarticulated indigenous knowledge. The correct system of colour organisation is known to the vast majority of Maasai people yet they do not necessarily express or explain it in words. It is based on the paradigm that drives Maasai culture yet very few people bother to identify or discuss either the colours or the paradigm. This is indigenous knowledge that is acted more than it is spoken.

A research project on women's access to skilled delivery services in Homa Bay County was designed by exotics in their own country. The questionnaire did not enable respondents to mention the custom of following suit in the choice of delivery venue. Respondents could not tell the researchers about this determining indigenous knowledge because they were not asked. During the famous 1985 S.M. Otieno case in which his widow sued his clan for the right to bury him in Matasia, near Nairobi, rather than in his indigenous home in Nyalgunga, in Western Kenya, nobody in court mentioned the indigenous knowledge-based need to follow suit. As the senior son in his family, he had to set precedent for all his junior brothers to follow. If he had not been buried in Nyalgunga, none of his brothers could have been buried there, thus destroying their clan and lineage.

When tiny white mushrooms sprouted after a rain on the termite nest in my Nairobi garden, I recognised them as "amandegere", a Kisii delicacy of Western Kenya, and was about to harvest, fry and eat them. Using his knowledge, my brother-in-law stopped me from doing so by telling me that they were poisonous. He being an indigene and I an exotic, I deferred but later found out that they were, indeed, "amadegere". Thus, his indigenous knowledge trumped mine even though it was inaccurate.

On a graver note, we can look at falsification of indigenous knowledge through the Turler fakes and the book that purported them to be new discoveries of ancient Maasai laibons' paraphernalia. It was supposed to be a revelation of indigenous knowledge and artistic genius that had long been hidden by the laibons but that was actually a cover for something else. The hoax was invented and executed by Gillies Turler and two American collaborators. While they carefully skirted any blatant claims of authenticity, they gave the distinct impression that their goods, made in local towns in Kenya were truly ancient art that predated legislation against trade in endangered flora and fauna. They made a lot of money before the Kenya Wildlife Service and the American Fish and Wildlife Service put an end to their enterprise. Even now there are people who fiercely defend the fakers who were falsifying Maasai culture and using game animal parts for self aggrandisement.

The indigenous knowledge that has informed the HIV/ AIDS epidemic in East Africa is another case in point. To give one minor example, the knowledge that eating a monkey or having sex with a young child would eliminate one's infection is indigenous, much to the consternation of the national and international health care communities. How was this knowledge generated and how did it gain credibility among so many indigenes? How many lives

have been ruined or lost because of indigenously generated falsehoods? What can be done about it? How can it be recorded in a sensitive way? How can or should this kind of knowledge be “managed”? There is an extensive and intensive effort both internationally and locally aimed at neutralising this kind of “indigenous knowledge”. It is called health education and it costs governments and donor agencies a lot of money each year. Other indigenous knowledge is simply ignored and discarded or managed through non-traditional channels. The knowledge that domestic violence is acceptable and should be endured is now being managed by avoidance of marriage and by recourse to civil authorities and codified law.

Recommendations

If we assume that indigenous knowledge should be reified and preserved rather than being discarded and forgotten, then we can consider models, methods and categories of knowledge as well as plans for dealing with the challenges of this massive undertaking. Efforts to collect indigenous knowledge can start at the very local, family level with family life histories, with a recording of grannies’ memories, group discussions and reminiscences of neighbourhood groups. Churches can generate histories of their institutions. Women’s groups can do the same as can male age sets. Companies and organisations can be collecting their workers’ and members’ recollections. Likewise, there is a need to collect and preserve the generated indigenous knowledge of children and young adults. In the United States this is usually undertaken by the folklorists, academics who collect informally generated indigenous knowledge in the form of songs, stories, sayings, jokes and a host of other ephemeral expressions. An important category of folklore is the games, sayings, jokes and stories that kids make up and pass on to the next generation of kids - the indigenous knowledge of childhood. With children in primary schools using laptops we now need to look at ways to increase their storage capacity and to examine what will be the unique indigenous knowledge of the “lapped generation”.

Looking back in history to people who have been overrun by foreigners with power, we can note how the indigenous peoples of Europe preserved their own beliefs and knowledge by turning them into child’s play and also by placing them into the context of the dominant groups systems. Gods became Christian saints as month and day names protected their memory. The Easter Bunny and the characters of Halloween live on as does the pre-Christian festival of lights at the darkest time of the European year. The Jews also did this by creating an ever growing book called the Talmud. There are many

models to be considered from pre-digital times. Simple writing is one, as are photography and sound recording. The digital age opens up and facilitates possibilities and models that we are just beginning to explore and experiment with.

These ideas and suggestions, if followed, should ideally lead to a massive and encyclopaedic accumulation of indigenous knowledge for us who are alive and for those yet to be born. We have the technological means to do it. The next step is to find two things: the will and the money.

Conclusion

Any reader who gets this far has noted that all of the above is nothing more than educated rumination. It has been intended to stimulate inquiry rather than to draw conclusions. It is the tiniest of entry points into a field of inquiry and action that is exceptionally complex and vast. The author has deliberately ignored issues related to ownership, copyright, patent and other *de jure* forms of control and compensation for access to and utilisation of indigenous knowledge.

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The Role of Knowledge Management Systems in The Retention of Tacit Knowledge in Research Institutes in Kenya

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Abstract

Despite the efforts by research and higher learning institutions to collect and collate data on tacit knowledge (TK), its rate of loss is still alarming. Challenges leading to the low recovery of TK have not adequately been investigated. This is lowering the impact of research on food security, climate change and weather pattern predictions, medicinal health and wildlife conservation not to mention the attainment of the Vision 2030 and sustainable development goals (SDGs). The continued loss of tacit knowledge in research settings has focused attention on the existing knowledge management systems (KMS) and their impact on the retention of tacit knowledge. This chapter discusses the role of KMS on the retention of tacit knowledge in research institutes in Kenya. The unit of analysis was the Kenya Forestry Research Institute (KEFRI). The study, leading to this chapter, used a mixed research approach encompassing the exploratory, descriptive and quantitative designs with the list of the employees of government owned research institutes in Kenya formed under the Science, Technology and Innovation Act (now repealed) serving as the sampling frame. Questionnaires were used to gather relevant information from the respondents. Data collected were analysed using both the descriptive and inferential statistics. The study established that there is a strong influence on the retention of TK attributable to units of change in KMS. The study recommends that government, research institutes and other concerned stakeholders should adequately invest in KMS which increase the retention of TK.

Keywords: *Knowledge management systems, retention, tacit knowledge, research institutes, Kenya*

Introduction

Research institutions play a central role in the development of technology worldwide without which the pace of civilisation would be slow. Employees of research organisations possess valuable information. However, they face challenges in effectively sharing the information throughout the organisation and beyond. For the organisations to benefit from the information, these employees must share their insights, experiences, problems, templates, tools and best practices effectively. Many research organisations focus on cutting-edge technology as the only way to gain competitive advantage. This way, they ignore tacit knowledge which is a crucial asset in giving them a sustainable competitive edge. Unlike the explicit, TK is not easily communicated in written form as it is purely personal, specific to a field and context. Furthermore, it is difficult to capture or share verbally and therefore hard to formalise (Dhamdhare, 2015). Thus tacit knowledge is well guarded in the employees' minds making it one of the most untapped organisational resources.

Research institutes in Kenya are created under various acts of parliament. For example, the Kenya Forestry Research (KEFRI) was created under the act of parliament CAP 250 of the Laws of Kenya in 1986 to undertake research in forestry and allied natural resources. There also exists international research bodies mandated to carry out research in various disciplines. In all these institutions, creativity and innovation are the key tools driving research and have aided discoveries and intellectual information build-up. There is need for effective knowledge management systems in these organisations to facilitate knowledge acquisition and sharing amongst the employees. This would also help the organisations to mitigate the challenges emanating from the rising proportion of aging workforce from whom vast knowledge is lost through untapped institutional memory (Joe *et al.*, 2013). Effective knowledge management also prevents duplication and reduces the need for training amongst young recruits.

Research organisations in Kenya strive to satisfy the United Nations Sustainable Development Goals (SDGs) 2.5 which requires that by 2020, nations should have attained the capacity to maintain the genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and ensure access to as well as fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge as internationally agreed (UN, 2015). Through practice, researchers accumulate experience and

immense knowledge which increase efficiency and production. Research institutions need to manage research data, innovation processes, systems or opinions, theories and ideas so as to increase their productivity and progress towards the realisation of the Vision 2030.

Akin to many other organisations, KEFRI has a rising number of greying workforce which calls for an urgent recruitment of young and agile personnel. For increased production and competitiveness, the aging staff must transfer the valuable TK through relevant knowledge management strategies. It is only through this that intellectual capital can be passed over and captured by the future generations hence eliminating the need for reinvention of knowledge (Omotayo, 2015). It is through knowledge management coupled with information and communication technology (ICT) that the researchers can be able to share their findings with colleagues and indeed the whole world (Omotayo, 2015). The only perceived setback in attempts to manage knowledge is the frequent reluctance by employees to share their expertise (Ajuhary & Nor'ashikin, 2015).

The old and experienced are normally the *bona fide* custodians of TK in research institutions and attempts to introduce KM of various TK have always been viewed as TK piracy by stakeholders. In this way, some of the knowledge is compounded and shrouded in hidden versions.

Knowledge management involves the creation, sharing, acquisition, and documentation of knowledge. These processes require state of the art and unique knowledge, skills, abilities, and behaviours to be effectively implemented. Knowledge creation is not a systematic process that can be tightly planned and controlled. The process undergoes a continuous evolution and emergent and motivation, inspiration and pure change play an important role in many situations. In addition, it has been widely accepted among scholars that organisational knowledge creation is heavily influenced by social processes (Mugambi & Kwasira, 2015).

Tacit knowledge is perceived as any form of knowledge and/or practice that is an authentic expression or outcome of a people's history and intellectual evolution and experience. According to Njiraine, Ocholla and Bosire (2010), tacit knowledge originates and is applied in the minds of the knowers. In organisations, it often becomes embedded not only in documents or repositories, but also in organisational routines, processes, practices and norms. It includes both theoretical and practical everyday rules and instructions for action and is based on data and information, but unlike

documents or repositories, it is always bound to persons. Organisational TK suffers from mismanagement since most of it is imbedded in persons and has not been systematically extracted or documented.

Statement of The Problem

Under ideal situations, knowledge transfer from experienced and older employees of research organisations should flow freely. This is possible when the institutions' employee turnover is slow enough to enable new recruits to acquire knowledge from the older employees. Besides, knowledge sharing in organisations is enhanced by knowledge enablers such as appropriate infrastructure and organisational culture. Unfortunately, most Kenyan research organisations have not developed these essential knowledge enablers. This is in spite of the fact that they are faced with demands to change and modernise their operations so as to facilitate development in the new "knowledge economy". Nonetheless, due to global competition, research institutions have become aware of KM's significance in achieving organisational and subsequent service delivery successes. While the goal of KM has been the improvement of organisational efficiencies, effectiveness and competitiveness through knowledge, only moderate successes have been experienced to date, with recent reports suggesting that the full benefits have yet to be realised. The lack of adequate content in many knowledge repositories is commonly attributed to employees hoarding knowledge as well as lacking the time or attention to contribute. The situation is further exacerbated by the lack of management support, inappropriate organisational culture, poor strategy, lack of effective leadership, inadequate budgetary allocations, dilapidated ICT infrastructure, non-existent KM policies, and limited staff competencies (Davenport & Beck, 2001).

Consequently, research institutions have been undertaking a number of reforms including accommodating the KM concept, as a means of attaining a competitive edge, by using the human and intellectual resources within their organisations (Fowler & Pryke, 2003). The Government of Kenya acknowledges that an economic and institutional regime that provides incentives for the efficient use of existing knowledge and creation of new knowledge is one of the elements that allow effective exploitation of knowledge. It further appreciates the fact that knowledge economy is a window of opportunity to improve welfare and move along an accelerated path toward sustainable development goals by shifting the economy onto a higher performance trajectory (Chifallu, 2011). As part of its development strategy, the Government of Kenya has put in place programmes to strengthen

the adoption of KM within institutes, evidenced by Vision 2030, where Kenya is committed to becoming a knowledge-led economy, wherein the creation, adoption and use of knowledge will be among the critical factors for rapid economic growth. In view of the foregoing, the study on which this chapter is anchored investigated how KMS influence the retention of TK in research institutes in Kenya. The specific objectives were to: assess the effect of ICT technological infrastructure, organisational culture, management support, knowledge management policy dimensions, and ICT competencies on the retention of TK in research institutes in Kenya.

Theoretical Framework

The study leading to this chapter, adopted the Knowledge Management Theory which defines the nature of knowledge as either explicit or tacit. Explicit knowledge is that which is formalisable and objectifiable in a scientific sense and whose content is typically captured in physical media. Knowledge that is explicit is often seen as object-nuggets to be captured, stored, distributed, and retrieved. In this sense, managing explicit knowledge is not very different from managing data (Spender, 2000). On the other hand, tacit knowledge is difficult to articulate and is found in the heads of people. This extends the domain of knowledge beyond reason and what can be objectified into intuition, emotion, judgment, and skilled action (Nonaka & Takeuchi, 1995). This theory was applied by the authors to understand what constitutes tacit knowledge in research institutes in Kenya as well as how best to manage this asset.

Methodology

The authors adopted an exploratory approach using a descriptive survey design. This facilitated an easy understanding of the current status with insight and ideas about the area of study. The study targeted 1000 civil servants working at KEFRI. Using stratified and simple random sampling, 200 public servants (representing 20% of the total population) were selected as respondents to a structured questionnaire used for data collection (See Table 1). 189 of the 200 questionnaires were returned. The returned questionnaires were checked for plausibility, integrity and completeness to ensure validity. Cronbach's Alpha was used to check the reliability. Statistical Package for Social Science (SPSS) was used to screen, code, and capture the data. Regression analysis was computed so as to determine the relationship between KMS and TK retention in research institutes in Kenya.

Table 1: Sample Size

Category	Target Population	Sample Ratio	Sample Size
Executive	30	0.2	6
Technical Support	500	0.2	100
Research Scientist	100	0.2	20
Admin Staff	370	0.2	74
Total	1000	0.2	200

Findings and Discussions

From the findings, the respondents rated ICT technological infrastructure as poor guided by a mean of between 3.7 and 4.6 for the associated indicators as illustrated in Table 2.

Table 2: The effect of ICT Technological Infrastructure on the Retention of Tacit Knowledge.

	Excellent	Very Good	Neutral	Fair	Poor	Mean	St dev.
Budgetary allocations & investments in ICT	2.0	22	4.1	6.1	65.3	4.6	0.3
ICT Physical & logical infrastructures Facilities	2.0	35	8.2	14.3	40.8	4.0	0.2
Infrastructure Availability & Accessibility barriers	2.0	29	8.2	6.1	55.1	4.6	0.3
ICT Strategic Plans & policies	4.1	29	14.3	18.4	34.7	3.7	0.3

The respondents rated organisational culture as fair guided by a mean of between 3.7 and 4.6 for the associated indicators as illustrated in Table 3.

Table 3: The effect of Organization culture on the Retention of Tacit Knowledge.

		Excellent	Very Good	Neutral	Fair	Poor	Mean	St dev.
Employee attitudes & perceptions	2.0	22	4	6.2	64.3	4.3	0.2	
Workplace & Team dynamics	35	10.3	12.2	40.8	2	3.8	0.2	
Personal & institutional factors	2.0	6.1	8.2	29	55.1	3.9	0.3	
Staff demographics	4.1	29	14.3	18.4	34.7	3.9	0.3	

The respondents rated management support as poor guided by a mean of between 3.7 and 4.3 for the associated indicators as illustrated in Table 4.

Table 4: The effect of management support on the Retention of Tacit Knowledge.

		Excellent	Very Good	Neutral	Fair	Poor	Mean	St dev.
Incentive & rewards	2.0	22	4	6.2	64.3	4.3	0.3	
Management structures	2.0	10.3	12.0	35	40.8	3.7	0.2	
Budgetary allocations & funding	2.0	6.1	8.0	29	55.0	3.8	0.3	
Leadership & direction	4.1	29	14.1	34.0	18.4	3.9	0.2	

The respondents rated knowledge management policy dimensions as poor guided by a mean of between 3.5 and 4.2 for the associated indicators as illustrated in Table 5.

Table 5: The effect of knowledge management policy dimensions on the Retention of Tacit Knowledge

	Excellent	Very Good	Neutral	Fair	Poor	Mean	St dev.
Clear and consistent Policy in place	2.0	32	4.0	6.0	54.1	3.8	0.3
Training/awareness-raising and Policy exposure	8.0	10.3	38	42	2.0	3.5	0.3
Knowledge creation and acquisition.	2.0	39	8.4	6.1	45	4.1	0.1
Intra-team knowledge sharing standards	4.1	10.3	14.1	18.5	31	4.2	0.3
KM sonferences and Colloquia	35	1	7.0	53	2.5	3.9	0.3

The respondents rated ICT Competencies as poor guided by a mean of between 3.8 and 4.5 for the associated indicators as illustrated in Table 6.

Table 6: The effect of ICT Competencies on the Retention of Tacit Knowledge.

	Excellent	Very Good	Neutral	Fair	Poor	Mean	St dev.
Provision of training & development	2.0	10.5	12	41	35	3.8	0.2
Impact of ICT trainings	2.0	6.0	8.5	55	30	3.8	0.3
Level of ICT knowledge & skills possessed	4.2	30	14.5	18.5	35	3.9	0.3
Highest level of education	2.0	26.3	4.1	6.1	60	4.5	0.2

Correlation

The study leveraged on the correlation technique to examine the degree of correlation between KMS and retention of TK. The computation presented the Pearson Moment correlation coefficient of $r=0.486$ indicating a positive relationship between KMS and retention of TK. This implies that an increase

in the implementation of KMS will lead to an increase in the retention of TK while a decrease in the implementation of KMS will lead to a decrease in the retention of TK. The significance test generated a p-value < 0.05 denoting that the test was statistically substantial.

Regression analysis

So as to test the relationship among the independent variables on the retention of TK in research institutes, the study leveraged on linear multiple regression, applying SPSS to code, enter and compute the measurements of the multiple regressions as illustrated in Table 7.

Table 7: Coefficient of Determination

Model	Unstandardised coefficients		Standardised coefficients	T	Sig.
	B	Std. error	Beta		
Constant	3.763	0.450		7.693	0.000
ICT Technological Infrastructure	2.354	0.129	0.977	0.107	0.001
Organization culture	1.877	0.280	0.460	0.144	0.002
management support	0.876	0.510	0.357	0.167	0.003
knowledge management policy dimensions	0.438	0.242	0.300	0.259	0.004
ICT Competencies	0.338	0.142	0.201	0.159	0.005

As per the SPSS generated Table7, the equation ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$) becomes:

$$Y = 3.763 + 2.354X_1 + 1.877X_2 + 0.876X_3 + 0.438X_4 + 0.338X_5 + \varepsilon$$

Where Y is the dependent variable (retention of tacit knowledge), X_1 is the ICT technological infrastructure variable, X_2 is organisational culture variable, X_3 is management support variable, X_4 is knowledge management policy dimensions variable and X_5 is ICT competencies variable.

Based on the regression equation computed, taking all factors into account (ICT technological infrastructure, organisational culture, management support, knowledge management policy dimensions and ICT competencies) constant at zero, retention of tacit knowledge will be 3.763.

The data findings analysed also show that taking all other independent variables at zero, a unit increase in technological infrastructure will lead to a 2.354 increase in retention of tacit knowledge; a unit increase in organisational culture will lead to a 1.877 increase in retention of tacit knowledge; a unit increase in management support will lead to a 0.876 increase in retention of tacit knowledge; a unit increase in knowledge management policy dimensions will lead to a 0.438 increase in retention of tacit knowledge; and a unit increase in ICT competencies will lead to a 0.338 increase in retention of tacit knowledge. This infers that ICT technological infrastructure contributes more to retention of tacit knowledge in research institutes.

At 5% level of significance and 95% level of confidence, ICT technological infrastructure had a 0.001 level of significance; organisational culture showed a 0.002 level of significant; management support showed a 0.003 level of significant; knowledge management policy dimensions had a 0.004 level of significant; ICT competencies had a 0.004 level of significant; hence the most significant factor is ICT technological infrastructure.

Summary of Findings and Conclusion

The findings suggest that the implementation of KMS positively influences the retention of TK. For example, 23.6 % of the corresponding change in the retention of TK can be explained by changes in KMS and hence, lead to high retention of TK which in the long run impacts on research institutions' overall performance and productivity.

It further concludes that even though research institutes have embraced ICT technological infrastructure in daily operations, the retention of TK, investment in ICT physical and logical infrastructure facilities, infrastructure availability and accessibility barriers, ICT strategic plans and policies are poor.

The study also concludes that the organisational culture within the institute is far below the expectation as employees' attitude and perceptions, workplace and team dynamics, personal and institutional factors as well as staff demographics are fair.

Additionally, the authors conclude that the management support is available in terms of management structures, leadership and direction. However, budgetary allocations, funding, incentive and rewards rated as fair.

In relation to KM policy dimensions, there was no clear and consistent policy in place, training or awareness-raising and policy exposure, knowledge creation and acquisition, intra-team knowledge sharing standards, KM tools in place and KM conferences and colloquia.

Finally, the study concludes that ICT competencies equally fall below expectations as provision of training and development, impact of ICT trainings, level of ICT knowledge and skills possessed and level of education was rated poor.

Implications of The Study

Specifically, the study will benefit the following:

Policy makers: The government, local community, the international community and other concerned stakeholders may utilise the knowledge gained from the research to develop programmes that address the challenges affecting the research sector. Strategies formulated can be aimed at increasing the rate and absorption of TK. Government and policy makers can leverage on the findings in reforming the research sector, address and minimise the challenges contributing to the constant reinvention of the wheel and massive loss of the taxpayers' money.

Research scientists: Both existing and new research scientists may benefit from the findings of this study since they can use it to understand the dynamics and methodologies of TK retention in research institutes.

Academic researchers and scholars: The study may make an empirical contribution to the field of KMS in relation to tacit knowledge retention in research institutes.

Recommendations

Based on the conclusions above, retention of TK in research institutions can be improved over time to ultimately increase the scientists' productivity. It is logical to articulate that the current phenomenon of poor retention of TK in these institutions can be reversed if the government, research institutions and other stakeholders ensure that KMS are sufficiently.

1. The study recommends improvement of ICT infrastructure as there are plausible constraints affecting the use of ICT by the researchers in many state research corporations. These include inadequate infrastructure, outdated personal computers, inefficient technical knowhow, inhibitive

cost of ICT, scarce data centres, and scanty internet cafes in the villages where research demonstrations are based. Currently, the majority of researchers use mobile phones and the traditional ICTs (radio and TV) during odd hours of the day for information consultations.

2. The study further recommends an investment in both ICT and KM training and development of staff. This is likely to enhance high productivity and increased understanding of technological advancements.
3. Research institutes should also invest in organisational cultural change and ensure that employee attitudes and perceptions, workplace and team dynamics and staff demographics issues affecting tacit knowledge retention have been addressed.
4. Consistent knowledge creation and acquisition policies need to be in place; training or awareness-raising and policy exposure seminars need to be carried out; intra-team knowledge sharing standards need to be developed and reinforced; and finally KM conferences and colloquia should be encouraged.
5. Finally, the study recommends that research institutes should invest in sustainable incentive and reward systems to motivate staff to share knowledge.

Areas of Further Research

Due to budgetary and time constraints, the research could not exhaust all the hurdles faced by research scientists and other state officers whilst performing their duties. More studies should be carried out to establish other underlying factors that influence TK retention as variables covered in this research account for only 23.6%.

Given that the unit of analysis was KEFRI, more research should be conducted in other research institutes in Kenya as well as other countries to establish any unique challenges that may exist. This study focused on the public research sector; more research is required for the academic sector.

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Role of Language in Indigenous Knowledge Management in Kenya

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Abstract

Indigenous languages are the major vehicles of indigenous knowledge. Therefore, when languages become extinct, the culture and knowledge die with it. This chapter presents the findings of a study that was conducted to investigate the intensive use of indigenous languages in Kenya to facilitate effective transfer and management of indigenous knowledge. The chapter demonstrates how the younger generation in Kenya speaks less and less of their indigenous languages and in the process indigenous knowledge and vocabulary is lost. The research was based on the social representations theory. Data were collected through face to face interviews from respondents selected by a combination of purposive and snowballing sampling techniques. The sample population included both staff and students from the Department of Language and Communication Studies and the Department of Information and Knowledge Management at The Technical University of Kenya. It was found that because English and Kiswahili are the official languages of communication in the workplace and also the official languages of instruction and given that the university is located in a metropolitan environment, indigenous language use has been largely restricted to the home environment. The younger generation prefers to use hybrid languages like “sheng” as the language of interaction in unofficial settings. The mass media was found to be offering effective platforms for the use and documentation of indigenous languages by hosting programmes in indigenous languages. The authors conclude that the birth and growth of languages, like “sheng” and other forms of slang is detrimental to the growth and perpetuation of indigenous languages and indigenous knowledge therein. This implies that indigenous languages are becoming obsolete to the younger generation. This has a direct and negative impact on the documentation and therefore, management, of indigenous knowledge.

Keywords: *Indigenous knowledge, “sheng”, indigenous language, Kenya, young generation*

Introduction

Indigenous knowledge (IK) is the local knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities (Warren, 1991). Thus, indigenous knowledge is the information-base for a society, which facilitates communication and decision-making. Indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems (Flavier *et al.*, 1995).

Since indigenous knowledge is the information-base for a society as described in the definition above, indigenous language is at the centre of the transfer of this information from one generation to the next. According to Kirkness (1998) language is the principal means whereby culture is accumulated, shared and transmitted from one generation to another. Language expresses the uniqueness of a group's worldview. Mazrui (1995) explains that a language has a dual community role as an instrument and as a symbol. It is normally accompanied by attitudes (held by members of in-groups and out-groups) which could sometimes lead to passionate conflicts between its seeming protagonists and antagonists. Language is therefore an instrument of transfer of knowledge from generation to generation. It is also a symbol of culture. Because language is accompanied by attitudes, its development and growth depends highly on positive or negative attitudes towards the language. A negative attitude towards a language by members of a community is thus detrimental. Attitude is influenced by one's social representation. This includes, but not limited to, one's formal education and family background.

In this chapter, the authors look at the role of language as an instrument in indigenous knowledge transfer. They look more specifically at the role of indigenous languages in indigenous knowledge management in Kenya. Chapter 2, section 7 of the Kenyan constitution (The Republic of Kenya, 2010) stipulates that the national language of the Republic is Kiswahili. However, the official languages of the Republic are Kiswahili and English. The same chapter also states that the state shall promote and protect the diversity of languages of the people of Kenya. Chapter 4, section 44 of the same constitution states that every person has the right to use the language, and to participate in the cultural life, of the person's choice. A person belonging to a cultural or linguistic community has the right, with other members of

that community, to enjoy the person's culture and use the person's language. There is no documentation of the exact number of languages spoken in Kenya. What we have are estimates of the number of languages spoken by the people of Kenya. Muaka (2011) gives an estimate of between 41 and 61 languages spoken in Kenya.

An indigenous language refers to the language spoken uniquely by an indigenous community and/or with origins in a given community or country (Spolsky, 2002). For this study the authors were interested in the indigenous languages in Kenya. Examples of the Kenyan indigenous languages include Dholuo, Kikuyu, Kikamba spoken by the Luo, Kikuyu, and Kamba communities respectively in Kenya. It is important to point out that Kenyans living in metropolitan settings tend to mix and switch from Kiswahili to English to their indigenous languages. The mixing and switching of codes gave birth to the language known as "sheng". According to Mazrui (1995), this is a normal occurrence in a multilingual society.

Indigenous languages are the major vehicles of indigenous knowledge. Therefore, when languages become extinct, the culture and knowledge die with it. Hence, this chapter investigates the use of indigenous languages in Kenya to facilitate the effective transfer and management of indigenous knowledge.

Problem Statement

As already mentioned, the Constitution of Kenya stipulates that Kiswahili is the national language while English and Kiswahili are the official languages. As much as indigenous languages and cultures are recognised by the same constitution, English and Kiswahili remain the most widely spoken languages in Kenya.

According to the World Data on Education VII Ed. 2010/11 report (UNESCO-IBE, 2010), English is the language of instruction in secondary schools in Kenya. Kiswahili is taught alongside the subjects and may be used freely by both students and teachers, especially in areas where it is the common medium of communication. This therefore means that any Kenyan who has graduated from secondary school can speak both English and Kiswahili comfortably.

Most of the young generation in Kenya, especially those in urban metropolitan centres, speak "sheng". Bosire (2006) argues that "sheng" has become the basic urban vernacular for the youth in Kenya in the 21st Century and its use

has spread to the electronic and print media. It is also the language of choice for popular music. The problem that this situation brings is that the young generation in Kenya speaks less and less of their indigenous languages. This leads to the loss of vocabulary and as a result the loss of their link to indigenous cultures and knowledge. This is because language is an influential symbol (Mazrui, 1995) and vehicle of a people's culture. Proper documentation and management of indigenous knowledge cannot be done when indigenous languages are becoming less and less active amongst the youth.

By the end of this chapter, the authors intend to provide answers to the following questions:

1. Does the young generation in Kenya speak their indigenous languages?
2. What are the challenges faced by the young generation in Kenya using their indigenous languages?
3. What is the role of technology in the promotion and development of indigenous languages in Kenya?
4. What effect/influence do official languages and urban languages have on the development of indigenous languages and transfer of indigenous knowledge in Kenya?

Justification of Research Study

Language has a dual role in the community. On one hand, it is an instrument and on the other hand it is a symbol. As an instrument, it aids in the transfer of knowledge and culture. As a symbol, it is a representation of identity. This chapter is based on the first role of language in the community: an instrument. The transfer of culture and traditional knowledge from one generation to the next is done largely by the use of language. Language is a code of communication that acts as a vehicle of indigenous knowledge across generations. When a language dies or it is no longer active, its vocabulary and the knowledge coded in it are lost together with the language. This in turn is a big setback in a community's development.

This chapter acts as a preventive or curative measure to the loss of indigenous languages and knowledge by identifying the challenges hindering the growth and development of indigenous languages in Kenya. By targeting the youth, the authors aim to bring to the attention of the public the current state of Kenyan indigenous languages and forecast their future so that

necessary measures are taken to safeguard them. The authors bring to light the importance of preserving indigenous languages which in turn facilitates effective indigenous knowledge management. As a result the findings may be able to generate transformative learning and change within academia and policy makers, in Kenya. All the wisdom, knowledge and teachings of each indigenous group are contained in its language. The authors illustrate that language and indigenous knowledge management are tremendously important to indigenous groups and indigenous nations and communities as language is directly related to all aspects of indigenous livelihoods.

Theoretical Framework

The researchers used the social representations theory which is defined by Moscovici (1988) as follows:

“Social representations [...] concern the contents of everyday thinking and the stock of ideas that give coherence to our religious beliefs, political ideas and the connections we create as spontaneously as we breathe. They make it possible for us to classify persons and objects, to compare and explain behaviours and to objectify them as part of our social setting. While representations are often to be located in the minds of men and women, they can just as often be found ‘in the world’, and as such examined separately.” (Moscovici, 1988: 214).

The social representation theory is of the school of thought that an individual’s perception and interpretation of the world around him are influenced by the individual’s social upbringing. Individuals who were brought up in the same environment will have similar attitudes and stereotypes towards various ideologies in the society. Their shared systems of values, ideas and practices influence their perception and interpretation of life in general. They therefore rely on this system of values, ideas and practices to make choices on a daily basis. Moscovici (1973) explained that a social representation is a system of values, ideas and practices with a twofold function: first, to establish an order which will enable individuals to orientate themselves in their material and social world and to master it; and second, to enable communication to take place among members of a community by providing them with a code for social exchange and for naming and classifying unambiguously the various aspects of their world and their individual group history.

An individual’s social representation may be influenced by the family setup, the education system, or the environment they live in, that is, urban or rural setting. Members of the same family, village, or religion share the same set of values that determine how they perceive and interpret the world around them.

An individual's age, environment (rural/urban) or education background, may therefore influence the attitudes and stereotypes they may have towards indigenous languages and cultures. The choice of language an individual makes is determined by, amongst other factors, their social representation.

Methodology

Data were collected through face to face interviews from respondents selected by a combination of purposive and snowballing sampling techniques. The sample population included both staff and students from the Department of Language and Communication Studies and the Department of Information and Knowledge Management at The Technical University of Kenya. The population of the study was ten (10) staff members (teaching and non-teaching) and 40 students.

Findings and Discussions

The findings of the study are presented and discussed hereunder.

The young generation and indigenous languages

Given that the research was done in a university setting, 80% of the sampled population were students while 20% were staff members. In terms of the level of education completed, 80% of the subjects interviewed had completed secondary school, 12% had an undergraduate degree, 4% had a master's degree and 4% were PhD holders. The sample population represented 9 ethnic groups.

In terms of language proficiency, there were three levels: bad (could not speak), average (were not very fluent but could communicate) and good (were fluent). A hundred per cent of the subjects interviewed indicated that they spoke good English and Kiswahili languages while 4% indicated that their spoken "sheng" was average. The other 96% spoke good "sheng". While 20% of the subjects did not speak their indigenous languages, the other 80% indicated their proficiency in their indigenous languages as good. According to the results, indigenous languages are mostly spoken at home with friends and family in informal settings. The results also show that indigenous languages are also spoken at work or in school with colleagues in formal and informal settings. All the respondents spoke English and Kiswahili fluently having indicated at least high school as their level of education where these are the languages of instruction. Living in Nairobi, all the respondents spoke "sheng" albeit 4% were not fluent.

The 20% of the respondents who cannot speak their indigenous languages have already lost their indigenous cultural heritage. They prefer to identify with modern cultures despite the fact that they are surrounded by people who speak their indigenous languages. This is a bad sign to the future of these languages and cultures because, as explained by Majidi (2013), language is a central feature of human identity and it is inextricably bound with identity and every language, as an integral part of a culture, is a rich heritage of that culture which mirrors its speakers' identity. The lack of indigenous identity by the young generation is the reason why documentation of these indigenous cultures and languages is needed.

Challenges

Lack of exposure to the language, lack of encouragement from parents and growing up in a metropolitan setting/environment were the reasons given for not speaking indigenous languages by the respondents. The 20% of the respondents who could not speak their indigenous languages all grew up and went to school in Nairobi and indicated that they neither spoke their indigenous languages at home nor with their peers. This can be attributed to urbanisation. When people from different cultures and communities live together and interact with one another there is need for a common ground in communication. A dominant language and culture makes it easier for people to interact and communicate. As indicated by Majidi (2013) some features of local language and culture are exchanged with wider culture and language or one culture is assimilated within a more dominant culture. This phenomenon has positive attributes and some negative sides too for it will lead to a reduction in the number of languages spoken in the world and one possible reason could be the "prestige" and "usefulness" of certain languages in the world and marginalisation of some other ones (Tandefelt, 1994).

When an individual is not encouraged to speak their indigenous language at home or by peers they tend to develop a negative attitude towards the said language. When they have already learnt other languages that facilitate communication with other members of the community then they will always choose to speak the languages they already know instead of learning their indigenous languages. As stated by Majidi (2013), multilinguals have the freedom to choose the language they want in various situations. A positive attitude towards a language by a multilingual speaker ensures they choose to speak it in place of a language they have a negative attitude towards.

Influence of official and urban languages

The 80% of the respondents who spoke their indigenous languages all indicated that they code switch or borrow vocabulary from English, Kiswahili and “sheng” languages when speaking their indigenous languages. Three reasons were given for borrowing words from other languages. Code-switching or code mixing was considered to be a normal occurrence by the respondents when speaking their indigenous languages. They also indicated that they borrow words when they do not know the vocabulary in their indigenous language especially when talking about technology. The other reason for borrowing words was to be better understood especially when the person they are talking to already speaks the language from which they are borrowing.

As discussed earlier, a dominant language and culture is seen as prestigious and more useful to multilingual individuals. They therefore either choose to communicate in the dominant language or borrow vocabulary from the said language when they speak indigenous languages. Because of the fact that our respondents and those in their immediate surroundings have undergone formal education, code switching becomes involuntary in their speech. It is even considered “normal” and “cool”. The effect of this on the indigenous languages is that more and more indigenous vocabulary is substituted by English, Kiswahili and “sheng” vocabulary. The result is the loss of indigenous vocabulary and culture as we adapt the new culture of code switching.

Technology and indigenous languages

When it comes to mass media and entertainment exposure to indigenous languages, 60% of the respondents watch indigenous television channels while 30% listen to indigenous radio stations. 40% watch movies in their indigenous languages while 60% listen to indigenous music. None of the respondents read indigenous newspapers due to unavailability. The young generation consider themselves to be tech-savvy and prefer interaction through technology. Therefore, the mass media can be useful in the promotion of indigenous languages and cultural practices as the results indicate that indigenous television channels and indigenous music were popular amongst the respondents. Mass media therefore serves as an avenue for the promotion of indigenous languages and knowledge and play a part in documentation and management as well.

As stated by Krauss (1992), not only is the documentation valuable for science, but it is also a national treasure for the people whose languages are thus preserved. The very existence of a book on a shelf or an archive of manuscripts can be of crucial symbolic value. Without adequate documentation, the

disappearance and eventual death of indigenous languages and traditional practices is inevitable. So is the loss of indigenous identity and thus the national identity in the long run. Documentation makes it possible for endangered languages and cultures to be re-introduced into the society through formative institutions like schools.

Conclusion and Recommendations

It is the hope of the authors that through this study, researchers will consider the importance of language and how much knowledge is contained in a given indigenous language, as well as understanding indigenous communities and their diverse cultures. Through this study, the authors have demonstrated that language is the key to the transmission of indigenous knowledge. The indigenous languages have a wealth of knowledge systems that span through generations but most of it has not been documented. To avoid losing the valuable indigenous knowledge, documentation is required for future generations.

There is need to direct more investment not only towards textual documentation, but also towards audiovisual documentation. This will not only contribute towards documentation of indigenous languages in use but also in showcasing indigenous culture and traditional practices. Language centres that aim to promote indigenous languages and traditions should be developed across the country to aid in the documentation and safeguarding of indigenous knowledge. The youth should be encouraged to actively participate in such projects to ensure prosperity of indigenous knowledge.

According to the authors, language plays a critical role in the transmission of indigenous knowledge: it is a way of knowing and living and provides direction for a person on how to interact with his or her environment. Indigenous languages provide identity and are intricately connected to guiding behaviour. The authors have shown that indigenous languages are used to bridge the gap between the generations by reconnecting the younger generation to the older generations and learning language, tradition, and knowledge from them.

The authors have also shown that a majority of the younger generation do speak the indigenous languages and only a handful of youth do not speak their indigenous language. The loss of language affects the identity of the person and the community. Cultural activities are intimately connected to language. The loss of language is also the result of western influence through channels such as television, radio and Internet, but the society is using these very tools today to preserve the indigenous languages.

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An Analysis of Indigenous Knowledge Legislation and Policies in Kenya

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Abstract

Since the dawn of history, humanity has always sought more knowledge to feed families, stay healthy, argue with neighbours, and understand the immediate environment, among other issues. Before scientific approaches of knowledge discovery emerged, local ways of solving problems were already strongly established. These ways have persisted to date and comprise what is known as indigenous knowledge (IK). As society scientifically developed, IK became a neglected area whose potential as a resource in development was forgotten. This neglect has led to myriad socioeconomic challenges affecting food security, environmental conservation, health and social cohesion, among others. Therefore, the need to rediscover and mainstream IK in development is great. This need is anchored on the understanding that IK is the basis for local-level decision making in agriculture, healthcare, food preparation, education, natural-resource management, and a host of other activities. One of the perspectives of enhancing the creation, use and perpetuation of IK is enactment of facilitative policies and legislation. This chapter analyses the IK legislation and policies in Kenya and the extent to which they have been implemented and thereafter recommends strategies which can be used to enhance the impact of IK in socioeconomic development in Kenya. Data that informed the study leading to this chapter were collected through content analysis of the existing IK policies and legislation. Additional data were collected through key informant interviews with information science professionals and policy makers. The study revealed that several legislative and policy provisions on the regulation, preservation, management, use and development of indigenous knowledge exist in Kenya. However, there are many gaps in the content and implementation of these provisions which should be addressed to enhance their impact on the promotion, growth and perpetuation of indigenous knowledge in Kenya. The findings here may be used by information practitioners, policy makers and communities to enhance the creation, use and impact of IK.

Keywords: *Indigenous knowledge, knowledge management, legislation, policies, Kenya*

Introduction

Scholars have provided varied definitions of what constitutes indigenous knowledge. Semali and Kincheloe (1999), for example, hold the view that indigenous knowledge reflects the dynamic way in which the residents of an area have come to understand themselves in relation to their environment and how they organise that folk knowledge of flora and fauna, cultural beliefs, and history to enhance their lives. Smith (1999) suggests that indigenous knowledge is a term that internationalises the experiences, concerns and struggles of some of the world's colonised peoples. Ocholla (2007) perceives IK as a complex set of knowledge and technologies existing and developed around specific conditions of populations and communities indigenous to a particular geographic area. Earlier, Onyancha and Ocholla (2004) provided a similar explanation, defining IK as a dynamic archive of the sum total of knowledge, skills and attitudes belonging to a community over generations and expressed in the form of action, object and sign languages for sharing. Characteristically, IK is local because it is engrained in a specific community; established within the boundaries of broader cultural traditions and developed by a specific community; intangible and consequently not easily codified; conveyed orally; experimental rather than theoretical; learned through repetition; changes continuously; and is constantly created and recreated, discovered and lost, even though outsiders may perceive it to be static (World Bank, 1998). On their part, Warren (1991) and Flavier (1995) perceive IK as the local knowledge or knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural resource management, and a host of other activities in rural communities (Warren, 1991). Thus, indigenous knowledge is the information base for a society, which facilitates communication and decision-making. As pointed out earlier, indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems (Flavier *et al.*, 1995).

Unfortunately, for reasons largely associated with ignorance and arrogance, IK has been neglected, vindicated, stigmatised, illegalised and suppressed among the majority of the world's communities (Onyancha & Ocholla, 2004). Nonetheless, Agrawal (1995) argues that IK has become a new area of attraction in development as demonstrated by the interest that the field has attracted among researchers, donors, writers and scholars. He further explains that although IK was earlier seen as inferior, inefficient and an

obstacle to development, today's thinking has recognised the value it holds for sustainable development. The increased focus on IK represents a shift from the preoccupation with the scientific knowledge which has failed to alter the lives of the majority of the poor over the last decades. It is important to note, however, that the increasing attention indigenous knowledge is receiving from academic and development institutions has not yet led to a unanimous perception or appreciation of the concept of indigenous knowledge. This is in spite of the emergence of the school of thought which posits that a country's ability to build and mobilise knowledge capital is equally essential for sustainable development as the availability of physical and financial capital (World Bank, 1997). The basic component of any country's knowledge system is its indigenous knowledge. It encompasses the skills, experiences and insights of people applied to maintain or improve their unique livelihoods.

Rationale of Indigenous Knowledge Legislation

Humanity has always sought more knowledge to feed families, stay healthy, argue with neighbours, and understand their immediate environment, among other issues, since the dawn of history. Before the scientific approaches of knowledge discovery emerged, local ways of solving problems were already strongly established. These ways have persisted to date and comprise what is known as indigenous knowledge. As society scientifically developed, IK became a neglected area whose potential as a resource in development was forgotten. This neglect has led to myriad socioeconomic challenges affecting food security, environmental conservation, health and social cohesion, among others.

The need to rediscover and mainstream IK in development is great. This need is anchored on the understanding that IK is the basis for local-level decision making in agriculture, healthcare, food preparation, education, management of natural resources, and a host of other activities. One of the perspectives of enhancing the creation, use and perpetuation of IK is the development of facilitative legislation and policies. Regardless of the growing number of studies on and interests in IK in Kenya, the issue of its protection is poorly addressed. For instance, literature on the legislative and policy provisions on IK in Kenya is scanty.

This chapter analyses the existing IK legislation and policies in Kenya; the extent to which they have been implemented; as well as their impact on the status of indigenous knowledge in Kenya. The authors also recommend strategies which can be used to enhance the impact of IK on socioeconomic development activities in Kenya.

Theoretical Framework

The study, informing this chapter, used the knowledge worldview model outlined by Fler (1999) as the theoretical framework. Hart (2010) defines knowledge worldviews as cognitive, perceptual, and affective maps that people continuously use to make sense of their social landscape and to find their ways to whatever goals they seek. He further explains that knowledge worldviews are developed throughout a person's lifetime through socialisation and social interaction. He points out that they are encompassing and pervasive in adherence as well as influential. However, they are usually unconsciously and uncritically taken for granted.

The model proposed by Fler (1999) classifies perceptions of knowledge into two broad categories, that is, indigenous and scientific knowledge and explains that these sets of knowledge define one's worldviews and points out that while indigenous knowledge is founded on the traditional worldview and produced for specific purposes, such as to maintain particular societies, scientific knowledge is founded on the "civilised" worldview and most of the times is produced for the sake of it. She argues that while scientific knowledge seeks power over nature and people, indigenous knowledge seeks to coexist with the same. She describes scientific knowledge as being materialistic, reductionist, rational, de-contextualised, individual and competitive. On the other hand, she extols indigenous knowledge as being spiritual, holistic, intuitive, contextualised, communal and cooperative.

While applying this model, the authors are, however, aware that although there appears to be a clear dichotomy between indigenous and scientific knowledge, this division is not realistic since these sets of knowledge interact with and influence each other. For instance, indigenous knowledge can be investigated, validated and documented using scientific means. Thus, indigenous knowledge can produce scientific knowledge and vice versa.

The knowledge worldviews model was applied to help the authors understand what really constitutes indigenous knowledge as well as its influence on its adherents' perception of the world around them. This perception and influence of indigenous knowledge largely determines how the communities use or control it. Legislation and policies on indigenous knowledge are generally aimed at regulating and promoting this asset. The suitability, application and impact of these legislation and policies on indigenous knowledge are assessed based on the worldviews of its bearers.

Methodology

The study was conducted through content analysis. This is a research technique used to make replicable and valid inferences by interpreting and coding textual material such as documents, oral communication, audio, text, hypertext, and graphics (Weber, 1990). The authors analysed the content of the Forests Act; National Museums and Heritage Act; Wildlife Conservation and Management Act; Plant Protection Act; Fisheries Protection Act; Witchcraft Act; as well as Protection of Traditional Knowledge, Genetic Resources and Folklore (draft). The authors also assessed the degree to which these legislation and policies have been implemented as well as their impact on the status of IK in Kenya. Additional information was collected through interviews with key informants consisting of ten (10) information scientists and five (5) policy makers.

Findings and Discussions

The findings of the study are presented and discussed hereunder.

The major provisions of the policies and legislation

Table 1 presents the key provisions of the respective legislation and policies which were identified and reviewed by the authors.

Adequacy of the policies and legislation

An assessment of the legislation and policies identified above revealed that they address the following issues relating to indigenous knowledge in Kenya:

1. Identification of what constitutes indigenous knowledge;
2. Recognition of both indigenous knowledge and their holders (both local and foreign);
3. Collection and/or acquisition of indigenous knowledge from individual, corporate or community holders;
4. Preservation and perpetuation of existing tangible and intangible indigenous knowledge;
5. Conservation of various expressions or manifestations of indigenous knowledge to enhance their longevity;

6. Promotion of the commercial, sentimental and other forms of use of indigenous knowledge for the benefit of their individual holders, indigenous communities and the society at large;
7. Promotion and popularisation of indigenous knowledge as an acceptable and usable knowledge which is beneficial to society;
8. Promotion of the participation of the affected indigenous communities in the management and exploitation of their indigenous knowledge;
9. Definition of crimes relating to indigenous knowledge in Kenya and stipulation of the punishment for these; and
10. Provision of frameworks for collaboration between holders and stakeholders of indigenous knowledge in Kenya and beyond.

Table 1: Key provisions of legislation and policies on IK in Kenya

Legislation or Policy	Year Enacted	Key Provisions	Strengths	Weaknesses	Implementing Organisation
Forests Act	2005	The protection of forests and the biodiversity therein in collaboration with the local communities; collaboration with the local communities to preserve and benefit from flora and fauna traditionally used or newly discovered by them; establishment of a fund to conserve indigenous forests; promotion of community-based forests; maintenance and protection of sacred trees and groves and other areas of cultural, ethno-botanical or scientific significance; provision of customary rights to forests and forest produce to support the custom of local communities; and provision of a framework for the management of indigenous forests.	Recognition of local communities Preservation and conservation of flora and fauna Funding mechanism for conservation	No clear provisions on the documentation, transfer or sharing of indigenous knowledge within and outside the communities	Kenya Forest Service
National Museums and Heritage Act, 2006 Zero Draft of the Kenya Heritage Authority Bill	2006; revised in 2012 Proposed Law (2015)	The establishment, control, management and development of national museums; identification, collection, protection, conservation, and the transmission of the cultural and natural heritage of Kenya; and to repeal the Antiquities and Monuments Act and the National Museums Act.	Identification, conservation, preservation and transmission of indigenous knowledge through heritage	Less focus on the promotion of access of the indigenous knowledge owned or held by museums and communities	National Museums of Kenya

Wildlife Conservation and Management Act	2013	The protection of wildlife species as well as their habitats and ecosystems; integration of community based natural resource management practices in wildlife conservation and management; collection, management and transmission of information on wildlife in Kenya; definition of the measures necessary for equitable sharing of wildlife benefits; promotion of adaptation and mitigation measures to avert the consequences of climate change which are detrimental to wildlife; devolution of wildlife conservation and management to communities through county governments; as well as the establishment of a endowment fund.	Provides a framework for the protection of wildlife and their ecosystems Recognises the challenges of climate change and poor funding on wildlife conservation	No provisions for identifying and demystifying specific wildlife species which influence community relations with them	Kenya Wildlife Service
Plant Protection Act	1937; revised in 2012	Prevention of the introduction of diseases destructive to plants in Kenya; prevention of the spread of pests; definition of the roles of land owners in the protection of plants; and regulation of importation of plants.	Protection of indigenous plants from diseases, pests, export or illegal trade Compensation for plant loss	Less room for the application of indigenous knowledge to protect plants; more focus on conventional rules	Ministry of Agriculture
Kenya Plant Health Inspectorate Service Act	2012	Assures of the quality of agricultural inputs and produce to promote food security and sustainable development in Kenya; coordination of all the matters relating to crop pests and disease control; provision of advice to the Director of Agriculture on appropriate seeds and planting materials for export and import.	Provides a framework for the protection of plant variety in Kenya	Does not recognise indigenous knowledge in plant protection	Kenya Plant Health Inspectorate Service
Fisheries Protection Act	1991; revised in 2012	The development, management, exploitation, utilisation and conservation of fisheries; licensing of fishing vessels; development of traditional and industrial fishing; promotion of cooperation amongst fishermen; and limitation of fishing in certain circumstances.	Recognises traditional fishing and preservation of fish	Does not make provisions for indigenous knowledge on fishing	Director of Fisheries

Witchcraft Act	1925; revised 1948, 1963 and 1964	Criminalisation of the acts of witchcraft; defines witchcraft as activities aimed to cause fear, annoyance and injury as well as claims of supernatural power; criminalisation of the use of charms and medicines with the intent to injure or attempts to discover offence by witchcraft; definition of witchcraft offences and their punishments.	Criminalises the negative use of witchcraft to cause injury or fear	Definition of witchcraft is confusing; may include with harmless indigenous practices	Provincial Administrations, District Commissioners and Chiefs)
Protection of Traditional Knowledge, Genetic Resources and Folklore	Draft Bill, 2015	Recognition of the holders of traditional knowledge; protection of traditional knowledge; conferment of rights to holders of traditional knowledge; protection of traditional cultural expressions such as music, dance, plays, rituals, sculpture, pottery, and carvings, among others; provision of access to traditional knowledge; definition of offences and penalties related to traditional knowledge and cultural expressions; promotion of the utilisation of traditional knowledge and cultural expressions in ways which benefit the knowledge holders and communities; promotion of the equitable sharing of the benefits of traditional knowledge and cultural expressions; and the establishment of Traditional Knowledge Digital Library.	Recognition and protection of indigenous knowledge owners of indigenous knowledge Promotes sharing of indigenous knowledge	Over-protection of traditional knowledge and its expression misses the point that indigenous knowledge is communal and spiritual in nature; capitalistic in approach	Undefined – “National Competent Authority”
Industrial Property Act	2001	Protection of inventive and innovative initiatives; facilitation of the acquisition of technology through grants and regulation of patents, utility models, rationalisation models and industrial designs.	Protection of inventions and innovations	Capitalistic; indigenous knowledge is sentimental	Kenya Industrial Property Institute

Source: Research data

The authors also noted that most of the legislation and policies are fairly recent. Many of them have been revised in the recent past to make them more relevant and applicable in the emerging circumstances. It was noted that most of the revisions were made in 2012. This is most likely because several lawmaking agencies focused on updating legislation and policies to conform to the requirements of the new constitution promulgated in 2010. Nonetheless, it was noted that some legislation have not been updated lately. One such case is the Witchcraft Act which was enacted in 1925 and last revised in 1964. These legislation and policies need to be updated to conform to the current constitution as well as the structure of government. There is also need to deal with the concept of witchcraft carefully because it is a complex practice bringing forth highly emotive aspects of religion and culture whose criminalisation may lead to unintended biases and discrimination.

The authors also noted that most of the legislation and policies focused on preservation and conservation. This is perhaps because these were the most urgent indigenous knowledge management needs. Important as these may be, indigenous knowledge must also grow and advance to meet the dynamic needs of the society. Therefore, there is need for legislation and policies which do not only perpetuate the existing indigenous knowledge but also of those that stimulate growth and/or emergence of new knowledge. There is also a need for legislation and policies which facilitate the validation of indigenous knowledge through scientific research and application within and outside the holding communities.

The scope of coverage of the fully enacted legislation and approved policies was also observed to be limited. For example, there were no direct provisions on traditional medicine, herbs and medicinal plants as well as traditional knowledge and cultural expressions. It was noteworthy, however, that drafts of these exist. The fact that they have not been enacted in comparison to the others demonstrates a lack of recognition of their value in national socioeconomic development. The stakeholders are encouraged to prioritise these legislation and policies to avert risks related to direct or indirect loss of indigenous knowledge.

Implementation of the policies and legislation

The findings from the key informant interviewees revealed that all of them were of the view that the legislation and policies related to indigenous knowledge in Kenya have generally been implemented well. Nonetheless, they pointed out that the challenges that hamper the effective implementation

of these legal and policy provisions include inadequate resources; poor coordination between the implementing bodies; frequent reorganisation of government agencies mandated to implement the provisions; culture of selfishness, corruption and other unethical behaviour in society; lack of adequate incentives to motivate the holders of indigenous knowledge to share it; civilisation which results in the neglect of sources or holders of indigenous knowledge; consequences of climate change which have affected sources or practices of indigenous knowledge; lack of documentation which leads to the loss of indigenous knowledge when its holders pass on; and stigmatisation which makes indigenous knowledge less appealing or, in some cases, criminal. These challenges require the concerted effort of government, professional and communal stakeholders to mitigate so as to enhance the effective implementation of the existing legislation and policies on indigenous knowledge in Kenya.

The impact of the policies and legislation on IK

The key informants identified both positive and negative impacts of the existing legislation and policies on indigenous knowledge in Kenya. The positive impacts included commercial revenues accrued through product sales or tourist visits; contribution to the development of national values and ethos which ensure peace and coexistence; promotion of the identity of Kenya as a distinct society and sovereign nation; conservation of natural habitats and ecosystems; contribution towards effective adaptation to and mitigation of the consequences of climate change; recognition of the value of indigenous knowledge; popularisation and application of indigenous knowledge; as well as documentation, preservation, conservation and perpetuation of indigenous knowledge. The negative impacts include stigmatisation of aspects of indigenous knowledge; division of Kenyans along the lines of traditional practices and ethno-based indigenous knowledge; as well as slow socioeconomic growth in cases where societies have remained conservative and closed to civilisation and modern development.

Conclusion

Several legislative and policy provisions on the regulation, preservation, management, use and development of indigenous knowledge in Kenya exist. However, there are many gaps in the content and implementation of these provisions which should be addressed to enhance their impact on the promotion, growth and perpetuation of indigenous knowledge in Kenya. All government and community stakeholders are encouraged to make concerted effort to address the gaps in the content and implementation framework of indigenous knowledge in Kenya.

Practical Application

The findings of this study may be used by information practitioners, policy makers and communities to enhance the creation, use and impact of IK. Moreover they may be used by stakeholders to address the challenges hampering the effective preservation and use of indigenous in Kenya through relevant legal and policy provisions. The findings may also be used by scholars to identify knowledge gaps which may ultimately stimulate research.

Recommendations from the Study

The authors propose the following strategies to mitigate the bottlenecks identified in the content and implementation of the legislation and policies on indigenous knowledge in Kenya:

Domesticate international indigenous knowledge policy framework

There are several indigenous knowledge legislation and policies on the global platform. Kenya should embrace and domesticate these to its benefit. This can be done by the relevant government agencies, such as government ministries, departments and agencies.

Establish indigenous knowledge resource centres within the public library system

In Kenya, as pointed out earlier, the National Museums of Kenya has an indigenous knowledge resource centre which is meant to serve the whole country through its branch networks. This is not adequate, especially given that IK is context specific. The authors recommend that all public libraries in Kenya should set up indigenous knowledge units.

Training on indigenous knowledge

In some countries, universities have gone a notch higher by initiating IK departments which provide training on IK issues such as history, languages and culture, among others. In some cases, aspects of IK are taught as courses in academic institutions. There should be deliberate efforts by training institutions to develop and deploy curricula on indigenous knowledge in Kenya.

Partnerships to leverage indigenous knowledge

Partnership lies at the foundation of the strategies for harnessing IK. This partnership should have a local, regional and global face. Whereas IK is localised in nature, its applicability can be global. Thus, there is the need to bring IK to the global platform. The relevant government, community and private sector institutions should explore and harness opportunities for collaboration on matters IK.

Indigenous knowledge research and validation

The relevance and value of indigenous knowledge grows with its applicability. This can be demonstrated, validated and enhanced through relevant research. Research and academic institutions in Kenya should mainstream indigenous knowledge in their research agenda.

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Section Four: Records Management

Sound Records Management: A Catalyst for Enhanced Justice Delivery in the Kenyan Judiciary

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Abstract

This chapter presents the findings of an empirical study undertaken between February and June 2014 in the Judiciary of Kenya. The study sought to investigate records management in the Judiciary of Kenya with a view to enhancing delivery of justice. The study adopted a mixed methods research (MMR) where the qualitative aspects were dominant while the quantitative less dominant. A case study design was used and data were collected through in-depth interviews, observation, and questionnaires. Qualitative data were analysed thematically and presented in a narrative discussion while the quantitative data were analysed using SPSS version 16. The findings of the study revealed that although records management had improved greatly since the promulgation of Kenya Constitution in 2010, a lot more needed to be done to overcome outstanding challenges such as the absence of policies, inadequate capacity of trained records management staff, lack of top management support as was the case with other departments which had been accorded directorate status. Besides, records management did not have an independent budget dedicated to its operations. The study made recommendations to help improve records management and the delivery of justice in the Judiciary of Kenya. These include formulation of records management policies, capacity building among records management staff, provision of alternative storage areas and enhancing awareness among top management on the significance of having sound records management as the foundation for efficient service delivery. The authors conducted the study at a time when the Judiciary of Kenya undertook to transform itself after long periods of judicial malpractice. The transformation saw the launching of Judiciary Transformation Framework which relies on effective records management for its success. The authors therefore provide the inevitable link between records management and effective justice delivery in the Judiciary of Kenya.

Keywords: *Records management, justice delivery, Kenya, Judiciary, court records*

Introduction

“Records are valuable assets that need to be managed by any organisation or nation” (The World Bank and International Records Management Trust, 2000:1). “They are vital to virtually every aspect of the governance process because they fulfil important functions in society by providing evidence of and information about the transactions of individuals and organisations” (Ndenje-Sichalwe, 2011:1). Government records not only document past decisions but also establish and protect current rights and responsibilities of both the government and the governed (Mnjama & Wamukoya, 2007). Records therefore, provide the basis of public accountability of how governments and government agencies carry out their public duties and the mandates of the citizenry. Orr (1999:7) contends that “records are particularly fundamental to the efficient and effective operation of the legal system of any country and are more critical to the administration of law than to any other function of the public sector”. Without records there can be no rule of law and no accountability.

The Judiciary is an important institution for promoting the rule of law in any country. Its centrality in any jurisdiction cannot be underestimated as its absence or dysfunctionality could lead to insecurity and recourse to private justice (Ojielo, 2010). The judiciary promotes the rule of law and thus creates an environment conducive for economic, political and social transformation. The Judiciary in Kenya as in other jurisdictions ensures that the government governs within the rule of law so that both foreign and domestic investment can thrive to spur socio-economic development (Kioko, 2000). The judiciary also provides a forum for the just resolution of disputes in order to preserve the rule of law, maintain law and order, and protect the rights and liberties guaranteed by the Constitution of Kenya.

In Kenya, the Judiciary is one of the three arms of government established under Chapter 10 of the Constitution of Kenya (Kenya Law Reform Commission, 2010). The other two arms are the Executive and the Legislature whose roles are to exercise executive authority of the Republic and to make and amend laws respectively. The Judiciary like the other two arms of government, is independent with the mandate of administration of justice and judicial matters (Presidential Circular No. 1 /2008). The Judiciary of Kenya is divided into two units: the technical unit comprising the courts and the administrative unit consisting of departments such as administration, personnel and library service to name but a few. The courts consist of: the

Supreme Court; Court of Appeal; High Court; magistrates courts; Kadhis' courts as well as specialised and tribunal courts (Lowry & Thurston, 2012). The courts are broadly categorised into two branches: superior courts and subordinate courts (Lubale, 2012).

Statement of the Problem

“Records are indispensable for the efficient, transparent, and accountable management of organisations but are often under-valued, ignored or misunderstood” (Williams, 2006:1). Initiatives aimed at enhancing economic performance, increasing government accountability and strengthening civil society such as administration of justice, administration and civil service reforms, e-government and open government all rely on access to accurate evidence (Thurston, 2005). Motsaathebe and Mnjama (2009a) observe that efficient and accountable court systems are widely recognised as a key contributor in the delivery of justice to a country’s citizens. However, ineffective management of records in many countries especially developing countries is common. Thurston (2005) argues that dysfunctional records management undermines the delivery of justice since decisions are made without full information. Furthermore, the absence of systematic recordkeeping controls leaves space for corruption or collusion between court officials and lawyers. In some instances, court time is wasted, delays occur, and the Judiciary’s standing is lowered. Moreover, the large volumes of records passing through a typical court system, their sensitivity, and time pressures on courts, all make effective records management essential. The Judiciary of Kenya has had a long history of judicial malpractices (Constitution of Kenya Review Commission, 2002; Ndungu, 2012) as noted by the then Chief Justice and President of the Supreme Court of Kenya, Dr Willy Mutunga. He lamented that “his regime found an institution so frail in its structures, so thin in resources, so low in its confidence, so deficient in integrity, so weak in public support that to expect it to deliver justice is wildly optimistic (Mutunga, 2011). Consequently, in May 2012, the Judiciary of Kenya launched its transformation framework aimed at, among other things, facilitating access to and expeditious delivery of justice and increasing public participation and engagement in judicial processes (Judiciary Transformation Framework, 2012). It is against this background that the authors sought to investigate records management in the Judiciary of Kenya as a tool to enhance justice delivery in Kenya.

Purpose and Objectives of the Study

1. To determine how records are managed from creation to disposition in the Judiciary of Kenya;
2. To assess the available records management policies, plans and guidelines;
3. To evaluate the skills and competencies among records management staff in the Judiciary of Kenya; and
4. To establish the level of awareness about records management and attitude of staff towards sound records management.

Methodology

The authors adopted a mixed method research where qualitative aspects were dominant while the quantitative were less dominant. A case study design was used and data were collected through in-depth interviews, observation, and questionnaires.

The study was carried out at the High Court and magistrate's courts in Nairobi and Uasin Gishu counties. Although the judiciary creates and maintains different types of records, including administrative files, staff files and case files, the study focused on case files referred herein as court records. The case files are a working tool for the judicial officers where all decisions made pertaining to a case are recorded and filed. Court records therefore play a critical role in administering justice in the courts, hence the need to focus on them in this study.

Study Population

The population of this study comprised staff from both the technical and administrative units of the Judiciary of Kenya. The technical unit comprised judicial staff (judges and magistrates), court registrars, and deputy registrars. On the other hand, the administrative unit comprised the executive officers, records officers (this cadre are however designated as archivists in the Judiciary of Kenya), and registry assistants (this group is designated either as executive assistants or clerical officers) in both the High Court and the magistrates' courts. The relative sizes of the population that were involved in the study are reflected in Table 1:

Table 1: Population of the Study

Category of Staff	Population (Nairobi County)	Population (Uasin Gishu County)
Court Registrars	4	*
Deputy Registrars	7	1
Judicial Staff (Judges and Magistrates)	71	11
Executive Officers	11	1
Records Officers (Archivists)	12	1
Registry Staff	20	4

(Source: Kenya Law Reports Website, 2013) * All court registrars are based in Nairobi

Table 1 above shows that most of the subjects of the study were located in the Nairobi City County; along with all the four court registrars, seven deputy registrars, 71 judicial staff (judges and magistrates), 11 executive officers, 12 records officers (archivists) and 20 registry officers. Uasin Gishu County, on the other hand, had one deputy registrar, 11 judicial staff, one executive officer, one records officer and four registry staff. In view of the small population of the potential respondents, the authors chose to do a complete enumeration of the study population (census) whereby all members of the population were included in the study.

Findings and Discussions

The findings of the study are organised into themes obtained from the objectives of the study. The themes were as follows: records management from creation to disposition; records management policies, plans, and guidelines; skills and competencies among records management staff; and level of awareness about records management and the attitude of staff towards sound records management practices.

The findings from interviews, questionnaires, observation and document review were collated and presented under respective themes as identified above.

Records Management from Creation to Disposition

For enhanced justice delivery in the Judiciary of Kenya, records must be managed throughout their whole extent of their existence, that is, from creation to disposition (Wamukoya, 2000). The discussion of findings on the theme of records management from creation to disposition is presented under the following headings: records creation; records access and use; records storage and maintenance; records appraisal and disposition; and records preservation.

Records Creation

The findings of the study revealed that the judicial officers (judges and magistrates) depended entirely on records to adjudicate their role and they recognised that records were vital for the administration of justice. This was supported by 77% of the judges and magistrates who strongly agreed that records were vital for the administration of justice and another 23% who agreed on the same as illustrated in Figure 1.

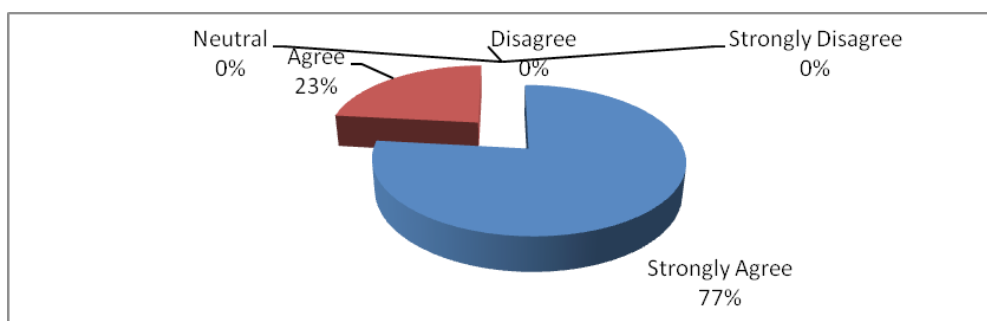


Figure 1: Records are Vital for the Administration of Justice

This finding is in agreement with the assertion of Motsaathebe and Mnjama (2009a) in their study on the management of high court records in Botswana. They found that the daily operations of the court depends on the availability of accurate, authentic and reliable information presented in a timely manner. The study therefore observed that it is important to maintain an effective and efficient records management system for the judicial system. The authors pointed out that if a case file relating to a trial cannot be located it becomes impossible for a judge or magistrate to pass a judgment leading to justice being delayed or denied the plaintiff altogether.

However, the current study revealed that records at the Judiciary of Kenya were being created without any form of documented guidelines. The absence of records management guidelines or metadata in the Judiciary of Kenya suggested that records management processes there were ineffective. This may undermine the effective and efficient justice delivery in the Judiciary.

These findings corroborate those of Kemoni (2007) in a study on records management practice and public service delivery in Kenya which revealed an absence of requisite guidelines in court registries in Kenya. Kemoni (2007) concluded that this had implications for service delivery in the public sector in Kenya. In yet another study by Uwaifo (2004) on management and use of records in Delta State University, Abraka, Nigeria, he found that there were no established procedures for controlling records creation. The author opined that as a result most records were disorganised thus affecting the effective dissemination of information.

The importance of managing records creation cannot be overemphasised. Records are created for use in the conduct of current business, to enable decisions to be made and actions taken (Shepherd, 2006). Wamukoya (2000) pointed out that records represent a major source of information and are almost the only reliable and legally verifiable data source that can serve as evidence of decisions, actions and transactions in the public service. Records therefore play an even more important role in agencies with statutory responsibility for maintaining law and order like the Judiciary of Kenya. Cox and Wallace (2002) also note that records are used in courts as evidence. They add that by giving silent but effective testimony, records help determine matters of fact and matters of law in both civil and criminal proceedings.

Records Access and Use

The respondents were asked if they had retrieval tools in place. The general findings revealed that the Judiciary of Kenya had a filing system that worked fairly well as was indicated by all (100%) respondents. The study established that the Judiciary of Kenya classified and arranged the records using an alpha-numeric classification scheme. The Civil Procedure Act, Cap 21 of the Laws of Kenya states that Judiciary records should be numbered numerically according to the order in which they are created every year. The filing system ensures that there is consistency in classifying records which consequently makes retrieval easier (Chinyemba & Ngulube, 2005). The current study also established that three registries had computerised in-house catalogues which showed the current position of each file created and maintained thus facilitating their retrieval.

In addition to the filing system and the computerised catalogues, the current study established that in a majority of the registries, shelves were labelled as indicated by 20 (80%) of the records officers and registry assistants interviewed. Labelling further facilitated the retrieval process as was similarly indicated by a study on the management of records at the University of KwaZulu-Natal by Chinyemba and Ngulube (2005). In this study 77.8% of the respondents indicated that their drawers were labelled, 19.9% said that they had indices and 22.2 % had automated retrieval systems.

The respondents were further asked if the Judiciary had a records tracking system. The findings revealed that all registries in the Judiciary of Kenya had a good tracking system that ensured any record leaving the registry was documented in a file movement register and the recipient of the files signed against the file(s) he/she had received. Among the registries a few (three) had a computerised tracking system which made tracking of their files easier and more efficient. In such cases the computerised system complemented the manual registers. The results suggested that there was a good tracking mechanism for records in the Judiciary of Kenya.

The findings on tracking of records in the Judiciary of Kenya seems to conform to the recommendation by Chachage and Ngulube (2006) that all organisations need to put in place mechanisms for records tracking. According to Ngoepe (2008), tracking records means documenting the movement of records so that the organisations can account for records they create and maintain. Accordingly, implementing an effective record tracking system can save staff time and enable their engagement in more productive work. International Standards Organisation (2001) asserts that tracking of records is important because it facilitates identifying outstanding action required; enables retrieval of a record; prevents loss of records; and maintains an audit trail of records transactions.

Although the overall findings indicated that access and use of records in the Judiciary of Kenya was fairly well managed, the Judiciary did not have a records access policy as indicated by all (100%) the respondents. Garaba (2011) observed that access to records should be facilitated by a relevant policy. Garaba's study, which investigated the management of the records and archives of former liberation movements in east and southern Africa held by national and private archival institutions, found that a majority of the institutions studied did not have any guidelines regulating access to the records.

Facilitating access and use of records is an important aspect of records management since organisational records can only be useful to the organisation if the various users of the records can access them in a timely manner. Records systems should therefore provide timely and efficient access to and retrieval of records in support of the organisation's business transaction and in meeting accountability and regulatory requirements (International Standards Organization, 2001). The ISO 15489 standard underscores the importance of effective management of records access and use in upholding the integrity of the records and in maintaining an audit trail as proof that records were effectively protected from unauthorised use, alteration or destruction. The current study established that the users of court records in the Judiciary of Kenya included the judicial officers (judges and magistrates), judiciary staff, lawyers and advocates of both the litigants and the accused, the individual litigants and accused persons and accredited media houses. An effective records retrieval system would enable these users to access the records whenever they need them.

Records Storage and Maintenance

The findings from this study revealed that in a majority of the court stations, there were no designated areas for storage of current, semi current and non-current records. Consequently there were instances where current and semi current records were put together making the registries appear congested and disorganised. Wema (2003) opined that keeping current and non-current records together makes records storage difficult and may render the records irretrievable. The findings revealed a serious space problem in the majority of the registries in the Judiciary of Kenya as illustrated in Figures 2 and 3.



Figure 2: Files kept on the floor in one registry in Nairobi County



Figure 3: Records Competing for Space with Broken Chairs and Tables in One of the Registries in Uasin Gishu County

Out of the seven court stations visited, only two seemed to have appropriate storage conditions for the records. The remaining five were however grappling with the issue of space as records were sometimes filed on the floor impeding their ease of retrieval. One of the stations that had conducive storage conditions reportedly benefited from donations from a non-governmental organisation (NGO) where two containers had been provided to serve as an archive for the station. The records in this court station appeared well organised and all the shelves were clearly labelled. The registry assistants explained that retrieval of the files took less time since the labels clearly indicated where records were filed. The fact that the registry was not congested also made retrieval easier. This satisfactory status of records storage was in stark contrast to what was happening in registries that did not receive any financial aid or other resources.

Storage is a vital aspect of every records management programme (Iwhiwhu, 2005). According to International Standards Organisation (2001) records require suitable storage conditions and handling so as to protect the records from unauthorised access, loss or destruction and from theft and eminent disasters.

Security of Records

The security of the records was another issue of concern to the authors. The respondents were asked how secure the records in the Judiciary of Kenya were. The findings established that records were relatively secure as suggested by more than half (60%) of the respondents. It emerged that good security measures including Closed Circuit Television (CCTV) cameras were fitted in all corridors and in some rooms in all the courts under study. Most of the registries were also restricted to staff only except in a few cases where, because of paucity of storage space, clients were served in storage areas.

Related to the issue of security was the prevalence of missing files in the Judiciary. Millar (2003) cautions that where security of court records is not guaranteed, corruption is rife and cases of missing files and documents geared towards evidence destruction is common. The findings in the current study revealed that missing files were reported in all the courts as indicated by 95% of the judges and magistrates and the testimonies of all the deputy registrars and executive officers interviewed. This was largely attributed to inadequate records management staff, poorly trained records management staff, lack of records management policies and guidelines, and reliance on manual records management strategies as shown in Figure 4.

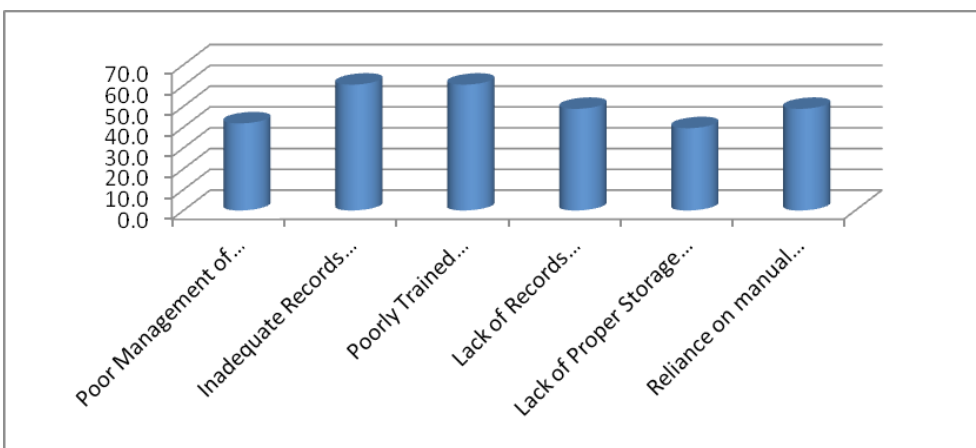


Figure 4: Factors contributing to missing files

The findings of a study by Motsaathebe and Mnjama (2009b) on managing court records in selected countries in Africa found that missing files had been a perennial problem in the Judiciary of Kenya. This was attributed to manual recording and filing systems of the courts or lack of due diligence on the part of the staff although deliberate effort to frustrate the course of justice could not be ruled out.

However, the findings in the current study revealed that the frequency of missing files had reduced drastically following the promulgation of the Constitution of Kenya, 2010. It was explained that before the promulgation of the new constitution, the judicial system in Kenya was marred by corrupt practices and as such cases of missing or lost files were many. The Chief Justice of the Judiciary of Kenya in his speech pointed out evils that had been associated with the judicial system for a long time to include lack of structures, limited resources, low public confidence and lack of integrity to name but a few (Mutunga, 2011). Similarly the Human Rights Watch (2012) made an observation that the courts were understaffed and underfinanced. Therefore, Kenyans awaiting trial faced long delays that violated their rights.

Records Appraisal and Disposition

The overall results of the current study on appraisal and disposition revealed that the Judiciary of Kenya did not have a well-coordinated programme for appraisal and disposition of its records. It would appear that the records were appraised irregularly especially when there was a shortage of storage space in the registries. Often the appraisal and disposition were left to the discretion of the "archivist" at each court station. Given that a single archivist would serve a whole station comprising many registries, one archivist in Eldoret Law Courts, Uasin Gishu County, who also served in two other stations observed that his responsibilities were overwhelming and he did not have time for records appraisal. This contravened the ideals of the Records Continuum (RC) Model which recommends that organisations should have appraisal and disposition programmes to ensure consistency and systematic approaches to the appraisal and disposition exercise. This view is supported by International Standards Organisation (2001) which recommends that appraisal and disposition of records should be done on a systematic and routine basis in the course of normal business activity.

The findings of this current study further revealed that the Judiciary of Kenya predicated their records appraisal and disposal on the requirements of the Records Disposal Act Cap 14 of the Laws of Kenya. This Act makes provision on when records in different categories in the Judiciary should be

disposed of by way of destruction. One of the provisions of the Act is that destruction of records relating to criminal cases should be done three years after the judgment date or final order in cases where acquittal or discharge had been ordered or fines only imposed. Alternatively, destruction could also be done in cases where sentences of imprisonment not exceeding one (1) year has been served by the accused or where the accused has been committed for trial and complaints dismissed by a magistrate. The implication of this is that any record pertaining to an accused person charged with a jail term of more than one year should be kept permanently. Discussions with the respondents revealed that currently there were many petty offenders whose jail terms exceeded one year and therefore their files were to be kept permanently thus clogging up storage spaces unnecessarily.

Records appraisal and disposition are fundamental to efficient and effective records management as they help the organisation to: control the growth of records; demonstrate compliance to disposition laws and reduce financial losses that may arise from missing files (Iwhiwhu, 2005).

Preservation

The present study established that the Judiciary of Kenya did not have a preservation policy. Moreover, the staff seemed not to be aware of the role that a preservation policy would play in an organisation. This was supported by all (100%) respondents indicating that the Judiciary did not have a preservation policy and 60% who did not see the need for such a policy. Ngulube and Tafor (2006) identified preservation planning and policy formulation as one of the activities that ensured the maintenance of records and other materials in a useable state. Keakopa *et al.*, 2009 noted that a clearly documented and realistic preservation policy is an essential foundation for any sustainable preservation programme.

The findings of the present study further showed that preservation of records in the Judiciary of Kenya was not taken seriously. The authors observed that environmental conditions were neither monitored nor controlled in almost all the registries; light readings were not taken and curtains and/or blinders were conspicuously missing. This was compounded by the fact that most of the storage areas were found in basements where relative humidity was always high with poor aeration. The RC Model recognises the need to protect records from the time they are created through to the time they are used as archives if such records should remain useful for the creating organisation and society in general. Ngulube (2003) observes that the maintenance of

proper temperatures and relative humidity is key in preserving records since inappropriate temperature and relative humidity contribute significantly to the deterioration of records of all formats.

Existing Records Management Policies, Plans and Guidelines

The findings of the study showed that the Judiciary of Kenya did not have a records management policy. This was indicated by all the registrars (100%) and records staff (100%) interviewed and 82% of the executive officers. The absence of the policy could impact negatively on the delivery of justice in the Judiciary of Kenya. This is because as explained earlier, records managed within a sound records management regime play a key role in the delivery of justice. According to Mnjama and Wamukoya (2007), the level of organisational commitment to managing records can be gauged by the existence or non-existence of records management policies, plans and guidelines. This view is supported by ISO 15489-1 which recommends that organisations seeking to manage their records effectively should first and foremost establish, document, maintain and promulgate policies, procedures and practices for records management (International Standards Organization, 2001, sec 6.2). As Roper and Millar (1999) stated policy and legislative framework are necessary to create an environment conducive for effective management of records. Meanwhile, International Standards Organisation (2001, sec. 6.2) indicates that the objectives of records management policy are the creation and management of authentic, reliable and useable records capable of supporting business functions and activities for as long as they are required.

Related studies revealed the absence of records management policies in many public sector organisations especially in developing countries. A study by Kemoni (2007) for instance showed that there was lack of records management policies in government ministries in Kenya. This he said impacted negatively on public service delivery in areas such as access to education and training opportunities. Similarly, a study by Komen (2012) on the management of personnel records in support of good governance at the Ministry of Local Government, also in Kenya, established that there were no policies governing the management of records.

The gravity of the absence of records management policies may be summarised in the words of Mnjama and Wamukoya (2007) who pointed out that one of the major challenges to the management of records in the ESARBICA region was the absence of organisational records management policies and

procedures to guide records management. They noted that the management of records in all formats must be supported by clear policies, procedures and guidelines if they are to retain their evidentiary value for accountable and transparent governance.

Skills and Competencies

The findings of the current study revealed that the Judiciary did not have adequately trained records management staff with both Nairobi and Uasin Gishu counties having only 13 trained records officers. Out of these, only one was posted to Uasin Gishu County to oversee records management in the entire region comprising of Eldoret High Court station, Eldoret Chief Magistrate's Court and a sister magistrate's court in the neighbouring county of Nandi. The remaining 12 records managers were posted in Nairobi to serve the seven divisions of Milimani High Court, Supreme Court, Court of Appeal and five stations of magistrates' courts spread across the county. It is therefore evident that the records management staff were not adequate and could not fully discharge their duties competently.

Moreover, the trained records managers were designated as "archivists" and were charged with the responsibility of managing semi-active or non-active records. The management of active records was left to staff that were not necessarily trained in records management such as executive assistants or registry clerks. The majority of them did not have any training at all while a few were trained in other fields like human resource management or public relations. This state of affairs affected the quality of records management as the majority of the staff did not seem to have knowledge of technical aspects of records management such as appraisal and disposition

Other related studies also seemed to indicate similar results. For example, a study by Ngulube and Tafor (2006) on the management of public records and archives in the member countries of ESARBICA indicated that national archival institutions were experiencing shortages of qualified staff since only 40–50% of the staff had qualifications directly related to either library and information science or records and archives management. They pointed out that the shortage of records management personnel caused tremendous pressure on the few staff that were in post.

In another related study by Nasieuku, Kemoni and Otike (2011) on management of e-records at Moi University Kenya, it established that only 10.6% of the respondents had knowledge and skills in records management. They pointed out that effective management of records was dependent on

staff receiving adequate records management training to effectively deal with specialised areas such as e-records, appraisal and disposition of records. In yet another study, Okello-Obura and Ssekitto (2011) established that a number of organisations in Uganda did not have qualified personnel in records and archives management although they were tasked with managing records in their organisations. The authors submit that the quality of human resources was critical in planning and developing strategies for good records management.

The foregoing discussion demonstrates that the views of Wamukoya and Mutula (2005) on capacity building requirements for records management and e-records management in east and southern Africa need to be taken more seriously. The authors asserted that an effective capacity building strategy for records management needed to be developed, firstly, by having a regional conference involving institutions with core responsibility for managing records, scholars in the area of archives and records management, policy makers and donor agencies to discuss training needs for the region. Secondly, the authors suggested that the following actions needed to be taken, amongst others: sensitisation and awareness creation workshop for key stakeholders; continuing professional development for records and archives professionals; development of a database of experts of institutions, resources and experts; and establishment of a secretariat to coordinate training and hiring of a champion to be responsible for implementing the regional capacity building plans and projects.

Level of Awareness about Records and Attitude of Staff towards Sound Records Management

The study sought to determine the awareness and attitude of the staff towards sound records management by looking at the value placed on records and records management in the administration of justice by top management and the staff; budgetary allocation for records management; and the value attached to records management in the organisational structure of the Judiciary. The findings of the study showed that records management was highly valued and seen as an important component in the administration of justice in the Judiciary of Kenya. This was supported by all judges and magistrates who took part in the study, where 47% of them indicated that records management was essential, 44% indicated that it was very important and 9% indicated that it was important as shown in Figure 5.

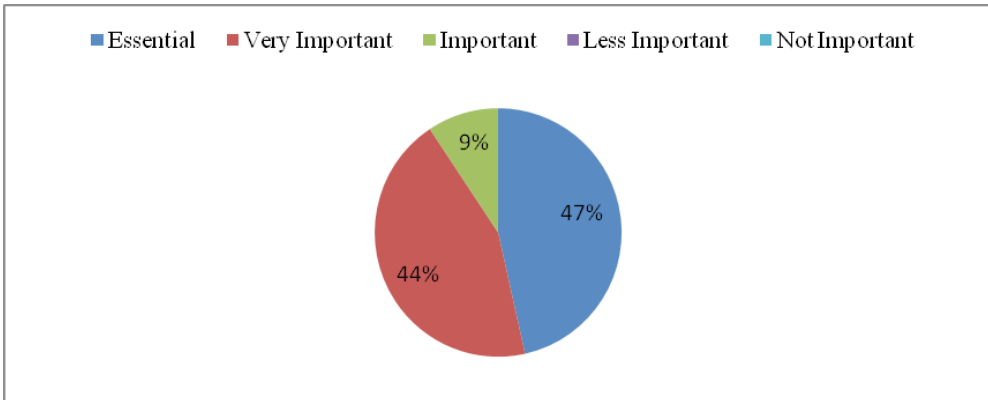


Figure 5: Value of records management in the administration of justice

All the registrars (100%) in the interviews also emphasised the value of records and one of them explained that records management plays a critical role in the delivery of justice and was indispensable in the administration of justice.

However, the study revealed that top management did not accord records management full support in terms of financial and infrastructural development. This view was expressed by more than half of the records officers and registry assistants who cited issues like the almost non-existent training support and the general deficiency in resources and infrastructure. It seemed that the level of support had improved notably after the launch of the Judiciary transformation framework.

Further, the deputy registrars were asked if they were aware of any budgetary allocation for records management functions. Their responses indicated that there was no budgetary allocation for records management at all. Activities related to records management were funded from the general station allocation but such budget was hardly ever made available. Moreover, the records management portfolio did not have a directorate like any other administrative functions such as human resource management. It was therefore not clear where records management was placed in the structure of the judiciary and no one was responsible to champion records management interests especially at high level meetings where policies were made. However, it was pointed out that plans were underway to create a directorate for records management. The respondents believed that this would drastically improve the status of records management and improve justice delivery in the Judiciary of Kenya.

Conclusion

The purpose of this chapter was to investigate records management in the Judiciary of Kenya with a view to enhancing the administration of justice. The chapter has established that although the Judiciary of Kenya had registered remarkable improvement in the way records were managed following the promulgation of the Kenyan Constitution 2010, the current records management regime needed improvement. The authors identified several weaknesses in the way records were managed which included: absence of guidelines on how records should be created; absence of an access policy to regulate who has access to the records and how this should be facilitated; poor storage of records characterised by a serious lack of space; absence of an appraisal and disposition programme; ineffective preservation of the records; absence of a general records management policy; inadequate trained records management staff; and inadequate top management support. In this kind of environment, it is not possible to guarantee the creation and management of records that are accurate, authentic, timely and reliable.

In view of this, the study made specific recommendations as presented below on how records management could be improved so that justice delivery can be enhanced.

Recommendations

The Judiciary of Kenya should consider providing appropriate storage environment and media for the records. In addition, the Judiciary's top management needs to provide alternate storage space for semi current and non-current records to free space in the registries for the active records. Wema (2003) asserts that keeping current and non-current records together makes records storage difficult and may render the records irretrievable. The Judiciary of Kenya needs to either hire or build regional go-downs where all the semi current and non-current records in a given region are stored. This would offer cheaper high density storage while leaving the primary storage space in the registries for current records hence easing congestion in the registries and facilitating easy and fast retrieval of records.

Records management staff should consider developing a preservation programme which would be preceded by an environmental impact assessment to determine possible environmental risks to the records. Such a survey should highlight the records that could be vulnerable to environmental related degradation so that appropriate interventions for their management are implemented. In addition, simple control measures such as installing

air conditioning plants, having curtains and /or blinds on all windows and fitting light filters on all fluorescent tubes are recommended. Borrowing from Orr (1999), all storage areas in the Judiciary of Kenya should be kept within temperature and relative humidity levels of between 18⁰ C–20⁰ C, and 35–45% respectively and light levels of about 50 lux maintained.

It is recommended that the records management staff need to consider developing an appraisal and disposition programme to ensure that appraisal and disposition is done on a routine basis to avoid having to appraise and dispose the records just for purposes of creating space in the registry. The study also recommends the amendment of some sections of the Records Disposal Act Cap 14 of the Laws of Kenya upon which appraisal and disposition in the Judiciary of Kenya is based. The proposed amendment is particularly with respect to the clause that requires records of persons charged in criminal cases whose jail sentence exceeds one year to be retained permanently. The study therefore proposes that the Judiciary's top management through the Law Society of Kenya could propose to the relevant committee in the National Assembly to extend this period to five years. This is informed by the observation that in the current practice most criminal cases including petty crimes attracts jail terms of between three to five years forcing the records staff to retain almost all the files on criminal cases.

The authors recommend that the Judiciary considers formulating a broad-based records management policy which should include the management of records in electronic media. The policy will guide records management and address issues such as records access, records security and records preservation.

The authors also recommend that more trained personnel be hired. Alternatively, the executive assistants and clerical officers currently running the registries could be in records management.

Additionally, the authors recommend the creation of "Records Officers" posts in the Judiciary alongside those of "Archivists". The post should be occupied by staff with records management. Their responsibilities should be well defined in the proposed policy to include managing Judiciary registries. The staff occupying the cadre of records managers should then work hand in hand with the archivists to ensure a continuum of care for the records from creation to disposition.

Finally, the authors recommend that the Judiciary of Kenya should consider elevating the status of records management by appointing a records management director. The directorate would champion all the interests of records management and ensure it receives its due recognition especially on matters relating to hiring of qualified staff, drafting records management policies and for budget planning. The authors also recommend the allocation of an independent budget for records management to cater for capacity building, equipment, supplies and more.

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The Effectiveness of Personnel Records Management in College Library, Federal College of Education, Eha-Amufu, Nigeria

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Abstract

Records are one of the most valuable information assets of an establishment which support decision making, demonstrate compliance, document the history of the organisation and support the day-to-day operations of an organisation. Records, like any other asset of an organisation, have to be managed appropriately to enable an organisation reduce cost and maximise value. By implementing good records management practices, an organisation such as an academic library, can reduce costs related to information and records management, improve efficiency and access to information, meet compliance obligations, and reduce legal risks posed by inappropriate records management practices as well as the capturing and maintenance of permanent historical records. This chapter explores the need for effective records management in the College Library, Federal College of Education, Eha-Amufu; examines the challenges that impede the effective utilisation of records; and makes relevant recommendations. The population of the study, leading to this chapter, consisted of the entire library staff in the college. Data were collected using observation and interviews. It was observed that the library does not have a records retention and disposition schedule; the staff in-charge of records do not have formal training in records management; facilities for preserving, storing and retrieving records are inadequate; and that there are no filing manuals. The adoption of the findings and recommendations of this study has the potential to help address most of the challenges associated with record keeping and management in academic libraries in Nigeria and beyond.

Keywords: *Records, records management, records management practices, challenges, academic libraries, Nigeria*

Introduction

Information is a key resource for all organisations. The way an establishment controls its information and records may directly affect its ability to complete, comply with regulations or recover from disaster. This in turn may lead to efficient operations. Records as information assets hold value for the organisation. The systematic control of records throughout their lifecycle is referred to as records management.

A record is a document consciously retained as an evidence of an action or a set of actions. Records refer to documented information despite their form or medium, received and maintained by an agency, institutions, establishment or individual in pursuance of its or their legal obligations or in the transaction of business of any kind (Charman, 1990). In the view of Usanga (2007), records can be any information or communication captured and retained in some producible media. This implies that records could be an object, a document, or medium which carries the information. Thus, records are information media created and valuable enough to be maintained. Most records are paper-based. However, information can also be carried in other forms of media such as machine-readable disks, graphics, images, diskettes, flash drives and pictorial media, be they photographic or not (Abdulrahman, 2015).

Records are important in any organisation: they represent its corporate memory. To determine how long to retain records, their capacity for re-use is also important. Records enable the staff to carry out day-to-day work. Administrators and managers utilise records on a regular basis to carry out various administrative responsibilities. Recorded information helps to enlighten and educate administrators on issues pertinent to the establishment. Records are important sources or strategic planning and successful implementation as well as good policy formulation and implementation (Umar, 2005). Additionally, records are primary sources of information for research, which serve as reference as well as evidence. Timely access to available records enhances effective planning, decision making and control.

The act of running and controlling a business or similar organisation to ensure success and continuity in any establishment is management. Agabi (1991) describes management as the organisation and mobilisation of all human and material resources in a particular system for the achievement of some specified organisational objectives in most rational manner. Thus, effective management involves the principles of planning, organisation, staffing, supervision and control.

The goals and objectives of an organisation can be attained through the availability of records. There is need for proper organisation, control and use of the available records in order to be of maximum value. Records management is the effective and systematic control of an organisation's records, regardless of the medium through their entire life cycle – from the receipt or creation until their final disposition. Records management, also known as records and information management, is the art of handling and maintaining office records from the time of creation to the time of disposal. The records are systematically preserved for future use. It involves the legal, legitimate, appropriate and timely gathering of information and creation, use, secure, storage, accessing, utilisation and disposal/selection for active records that are usable.

The provision of the right information in its right place in the right order at the right time for the person at the lowest cost is the purpose and essence of any records system. This can be achieved by putting in place an integrated records management programme (Baje, 1998). Lack of integrated records management programme may lead to inefficiency in administration and to loss or non-availability of vital information required for making decisions (Enwere, 1992).

Problem Statement

The practice of records management in Nigeria faces numerous challenges. Among these are the lack of skilled records management personnel in key institutions, low priority given to records management activities and inadequate funds allocation for records management. Record keeping has been neglected for many years and these problems pose serious challenges to effective records management in tertiary institutions in Nigeria, resulting in high profile failures and poor accountability. In most establishments, employees' records are not properly organised and utilised regardless of the importance of recorded information. It is regrettable that literature on archive and records management does not pay much attention to personnel records management even though these files are important. Since effective records management enhances planning and decision-making, it is proper that records management is given priority in all organisations. It is against this background that the authors decided to conduct a research study to examine the effectiveness of personnel records management at the library of the Federal College of Education, Eha-Amufu, Nigeria.

Objectives of the Study

1. To ascertain the personnel records management practices in place at the library of the Federal College of Education, Eha-Amufu;
2. To determine the availability of a retention and disposal policy in the library of the Federal College of Education;
3. To investigate the competency of records personnel at the records management unit in the library of the Federal College of Education; and
4. To find out the challenges faced and thereafter recommend strategies to improve records management at the library of the Federal College of Education.

Historical Background

Federal College of Education, Eha-Amufu branched from Eha-Amufu College of Education which was established in 1981 by the then Anambra State government. It was taken over by the Federal Government of Nigeria on 1st April, 1993. The college library was established in December 1981 operating in one room apartment used by the Advanced Teachers' Training College, Eha-Amufu. This one room apartment also served as the librarian's office and accommodated all sections of the library. The college library started with a stock of seventy-three (73) books, purchased and donated to the library by the academic staff on the appeal of the pioneer provost. The books which were donated covered different fields of knowledge and formed the foundation collection of the college library. The library commenced skeletal services in January 1982, with a few tables, chairs, textbooks, reference materials and a few professional and non-professional staff.

Currently, the college library is located at the heart of the college in the library building constructed in 1987. It has a stock of various book titles, journals, general reading materials and other materials that support the curriculum and courses offered in various department of the college. It has a sitting capacity of about 4,000 readers, approximately 6,386 collection of book titles and more than 500 journals and periodicals. The library also has a virtual library collection of about 7,046 copies of students' projects and numerous volumes of newspapers and magazines (back files and current issues). The virtual library collection has been upgraded to an electronic library with about 360 laptop computers to accommodate 360 users simultaneously. Various records available in the library include acquisition records, accession records,

cataloguing records, circulation and reference records; and personnel records which is the focus of this paper. Bibliographic tools/records include the card catalogue, serial list of holdings or index to periodicals, index to periodical articles, newspaper index and index to students' projects, which constitute the total resources of the library fully and easily accessible to the users.

The library building accommodates the college administrative units because of inadequate space. This constitutes some impediments for expansion with the increase in the number of student enrolment and subsequently users of the college library. The college library is yet to embrace full computerisation. Koha library software is being used but not properly functional because the staff are yet to be fully trained on its usage. Personnel records held by the library include appointment letters, confirmation letters, personal data forms, initial forms filed on appointment including acceptance letters, redeployment letters, annual leave forms, sick leave forms, maternity leave letters, acknowledgement letters, queries and replies to them, letters of permission and minutes, to mention but these.

Methodology

The population of the study constituted the entire library staff. The respondents of the study consisted of nine (9) professional librarians and confidential secretary to the College Librarian who is the head of administration of the library, seven (7) library officers, four (4) library assistants and one (1) bindery officer.

Data were collected through observation and interview. Face to face interviews were carried out with all the respondents and especially with staff taking care of the records in the library.

Findings and Discussions

The findings of the study are presented and discussed hereunder.

Maintenance and Use of Records

The six (6) staff in charge of records were asked how they create records. In response, they stated that they create, maintain and utilise records in their day-to-day administration and other operations. Records of acquisition, accession list, catalogue cards, library use statistics, bulletins, minutes of staff and committee meetings, queries, letters of appointment, acknowledgement, confirmation, permission, sick leave, leave forms, correspondences from other departments of the college were kept in the library. These records were yet

to be fully automated at the time of data collection but plans were underway for their full automation.

Proper storage medium and filing system facilitate quick and easy access to the records at the appropriate time. The records manager's responses show that wooden shelves/rack, steel cabinets, drawers, catalogue cabinets, files and cardboard boxes and computers were the available storage facilities for records. Good filing procedures enhance fast, easy and accurate retrieval of recorded information. This is made possible through the use of a good index.

The library has provided for disaster preparedness by availing fire extinguishers. Similarly, the records are fumigated from time to time. Personnel records are on closed-access while other records are open to the public.

Filing System

In response to the type of filing system used in the library, alphanumerical filing system was identified. These are demonstrated in Table 1.

Table 1: Filing Systems in Place

File Name	Files No.
Provost	FCEE/Lib/1
Registry	FCEE/Lib/2
College Librarian	FCEE/Lib/3
Bursary	FCEE/Lib/4
Bookshop	FCEE/Lib/23
Medical Centre	FCEE/Lib/24

Alphabetical arrangement is used to file personnel file, thus, it has its own numbering system but utilise the system employed by the College Personnel Department. Codes such as SS are used to represent Senior Staff while JS stands for Junior Staff. The files of the department are numbered as they are received as shown in Table 2 below.

Table 2: Alphabetical Arrangement for Personnel File

File Name	Files No.
Arua, Nwachukwu	SS261
Odo, Chukwuka	JS301
Eze, Chidi	JS321

Storage Facilities and Security of Records

It was observed that the room where the personnel records in the library were kept was not well-ventilated and had no functional fans or air-conditioners. Lack of these storage facilities can endanger the life of the materials due to possible attacks by mould and insects. Electricity supply was also frequently unavailable and the available generator was not always used because of lack of money to procure fuel. Air conditioners were available at the electronic library and the librarian's office but frequent power outages rendered them dysfunctional. This affected the temperature and humidity of the storage rooms.

The college library secured records from theft and mutilation by the use of restrictive methods only such as requiring patrons and staff to enter and exit the building through one door which is monitored at all times; employing one or more security guards to patrol the repository after closing; taking steps to prevent removal, or duplication of keys, installing high-quality, heavy-duty locks, dead bolts, and hinges on all exterior doors; ensuring that keys are returned when employees leave, and changing all locks periodically; installing grills or screens on ground-floor windows; and installing after-hours security lighting, among others.

Retention and Disposal Control

Records management in the library is carried out manually. Inactive records (files of dead staff, and staff redeployed to other departments) were put on inactive shelves. These inactive and vital records are put in file cabinets and labelled "P" denoting personal file. Some of these cabinets were weak, rusty and very dusty as a result of lack of maintenance and use. This portends dangers for the life of these records. There is confusion about the records to be disposed because the records are not listed properly, appraised and no retention schedule were available.

Most records can be managed electronically whereby paper records are replaced by electronic records; users have easy access to records with relevant software and hardware tools. Database systems can be used to handle records. Thus, records should be adequately cared for by providing secure rooms/separate building and storage facilities.

Level of Professional Training

None of the staff handling records in the college library have any professional training in records management leading to lack of professional skills and competences needed to manage the available paper-based records and inability to manage electronic records which in no distant time would be the main type of records in the library. This was in consonance with the assertion by Afolabi (1999) that insufficient skilled and experienced records management personnel impede effective records management practice in Nigeria.

Table 3: Personnel Training

Respondents	Number	Percentage (%)
Management	4	18.2
Librarians	5	22.72
Library Officers	7	31.82
Library Assistants	4	18.2
Administrative Officer/Secretary	1	4.54
Bindery Officer	1	4.54
Total	22	100

Implication of the Study for College Library Administrators

The findings of this study identified strategies for improving personnel records management in college libraries in Nigeria and Federal College of Education, Eha-Amufu in particular. This has implications for college library administrators to put in place strategies to facilitate the effective management of staff records. Obviously, a good records management practice ensures that the right information is available at the appropriate time to the person who needs it. It is therefore, imperative that procedures for effective, good and proper records management practices are integrated in the system.

Conclusion and Recommendations

The following conclusions can be deduced from the findings of the study:

1. Creation, retrieval, scheduling, filing of records and correspondence management was still being done manually at the time of data collection.
2. Retention and disposal schedules were unavailable.
3. Lack of filing procedure manual which made filing difficult.
4. Use of poor, rusty and dusty filing cabinets.
5. Limited storage facilities.
6. Records managers/personnel taking care of records lack essential training in management of records.
7. There were no procedures for the effective management of records.

When these problems are properly managed, efficient and effective options would be developed within and between colleges. The underlisted strategies are recommended to improve the management of records in College Library, Federal College of Education, Eha-Amufu:

1. Adoption of an appropriate filing system.
2. Provision of a manual to guide filing and address the difficulty encountered by the system of filing in use.
3. Computers and Internet services should be introduced.
4. Proper and appropriate storage facilities for good management of records should be provided.
5. Retention of records/disposal schedules should be developed and implemented to avoid irrational opening of new volumes.
6. Training and retraining of all staff handling records, especially in the application of ICTs in records management to enable them operate effectively in this digital era.
7. Provision of air conditioning to regulate temperature and thereby eliminate challenges relating to high temperature and humidity.

8. Records management staff should conduct periodic checks to enhance effective records management.

It is likely that the adoption of these options in the College Library, Federal College Education, Eha-Amufu would perhaps address most if not all the challenges associated with records keeping and management.

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The Role of Disaster Management in Sustainable Development in Kenya

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Abstract

The aim this chapter is to investigate the management of disasters and sustainable development in Kenya with a view to providing relevant recommendations. The specific objectives of the study which provided content for this chapter were to: find out the types of disasters likely to affect Kenya; establish if and how disaster management activities are linked to sustainable development; determine the application of Information Communication Technology in disaster management; establish the challenges faced in undertaking disaster management activities; and propose recommendations on how to integrate sustainable development in disaster management initiatives. This chapter is informed by The United Nations Hyogo Framework Action Plan 2005-2015 for Disaster Risk Reduction which links disaster management with sustainable development (United Nations International Strategy for Disaster Reduction, 2005; Hyogo Framework for Action, 2005-2015a). Interview guide was used to collect data from Kenya National Disaster Operations Centre (NDOC). The author established that disasters likely to affect Kenya include floods and earthquakes, tremors, building collapse, diseases, road traffic accidents, terrorism and cyber crimes. It was further established that to some extent, the Government of Kenya links disaster management with sustainable development. The Government of Kenya uses various forms of Information and Communication Technology during disaster preparation phase for sensitisation and awareness and that NDOC faced challenges in conducting disaster management. Among the study recommendations is need to integrate disaster management activities with sustainable development in Kenya and utilisation of other ICTs in disaster management.

Keywords: *Development and disaster, disaster management, Kenya, risk management, sustainable development*

Introduction

What constitutes development is a subject of debate. Recent debates seem to focus on values as the missing link in development. Todaro and Smith (2006) pointed out that the three core values of development are sustenance, self-esteem and freedom from servitude. The World Bank (2015a) notes that sustainable development recognises

growth, is both inclusive and environmentally sound and is geared to reduce poverty and build shared prosperity for today's population and continue to meet the needs of the future generations. Despite the relationship between disasters and development, disaster risk and resilience have received insufficient emphasis in the original Millennium Development Goals agenda (United Nations, 2012). Whilst there is universal acceptance that disasters can erode and destroy development goals, there is limited recognition of the role that different approaches to development play in creating or increasing vulnerability (United Nations, 2012).

World Bank (2015a) and European Union (2015) concur that sustainable development should meet the needs of present generations without compromising those of future generations, is inclusive, and environmentally sound so as to reduce poverty. A disaster is a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community' or society ability to cope with its own resources (International Federation of Red Cross and Red Crescent Societies, 2015a). The world has witnessed various disasters which may affect information materials such as natural hazards, criminal or terrorist attacks, industrial accidents, and computer crimes (cyber-terrorist attacks). Disaster management is the organisation and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular, preparedness, response and recovery (International Federation of Red Cross and Red Crescent Societies, 2015b).

According to the European Commission (2015), sustainable development offers a vision of progress that integrates immediate and long-term objectives, local and global action, and regards social, economic and environmental issues as inseparable and interdependent components of human progress. It is pointed out by United Nations Educational, Scientific and Cultural Organization (2015) that sustainable development stands for meeting the needs of present generations without jeopardising the ability of future generations to meet their own and is based on principles of The Earth Charter namely: affirming gender equality and equity as prerequisites to sustainable development; providing transparency and accountability in governance, inclusive participation in decision-making and access to justice; and integrating the knowledge, values and skills needed for sustainable way of life into formal education and lifelong learning.

According to UNESCO (2015), The World Summit on the Information Society, a United Nations forum, provided a forum in which multiple stakeholders including international organisations, governments, private sector and civil society would discuss the opportunities of the new information and communication environment and also address challenges such as inequality in access to information and communication that is “digital divide”.

Further, World Bank (2015b) has developed a programme known as Information for Development Program (InfoDev) which seeks to among others, help maximise the impact of ICTs in global efforts to achieve the internationally supported Millennium Development Goals (renamed Sustainable Development Goals).

Information resources such as records empower society in terms of establishing extent to which public resources are used in a transparent and accountable manner. World Bank (2012) opines that records management is a key support for development effectiveness while International Records Management Trust (2009) points out that efficient information and records management provides the basis for poverty reduction, accountability, effective management of state resources, protection of rights and entitlements, services to citizens, anti-corruption strategies and rule of law. According to Republic of Kenya Auditor-General Report (2015), summary of the Report of the Auditor-General on the financial statements for ministries, departments, commissions, funds and other accounts of the national government for the Year 2013/2014 overall audit results indicate that for the year ended 30 June 2014, out of the audited 101 financial statements, only 26 (26%) had a clean (unqualified) audit opinion.

The link between records management and disaster management is documented (The Ohio State University, 2015; Ngoepe, 2014; Ambira & Kemoni, 2011). The Ohio State University (2015) points out that one of the seven elements of an effective records management programme is disaster prevention and recovery planning. Further, a disaster prevention and recovery plan is a written, approved and implemented plan for the prevention or mitigation of records loss in an emergency or disaster, as well as a plan for recovering records in such circumstances.

Ngoepe (2014) established that strong record organisations primary tools in identifying records management should be integrated with risk management. Ambira and Kemoni (2011) noted there is need to strengthen records management as a critical success factor in risk mitigation within the Kenyan banking industry.

The discussion that follows presents the terms disaster, disaster management and business continuity planning.

Disaster Management, Risk and Risk Management

Disaster management is the organisation and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular, preparedness, response and recovery (International Federation of Red Cross and Red Crescent Societies 2015b).

An appropriately designed and implemented disaster preparedness and response plan will help protect and recover records to ensure their preservation for as long as they are required for business, legislative, accountability and cultural purposes (Queensland State Archives, 2012). The aim of an effective disaster management plan is to facilitate business continuity planning in an organisation. Business Continuity Planning comprises measures to prevent, prepare and recover from a disaster (National Archives of Australia Digital Recordkeeping Guidelines, 2004).

Risk is uncertainty of outcome, whether positive opportunity or negative threat, of actions and events while risk management includes identifying, assessing and responding to risks (Government of Canada Integrated Risk Management Framework, 2000; United Kingdom HM Treasury Orange Book, 2004). Response to a risk may involve any of the following actions: tolerating the risk, treating the risk to constraining the risk to an acceptable level, transferring the risk; and terminating the activity giving rise to the risk (United Kingdom HM Treasury Orange Book, 2004).

Background of the Study

The Republic of Kenya is a sovereign state in Africa with its capital and largest city being Nairobi (GoK, 2015). Kenya lies on the equator with the Indian Ocean to the south-east, Tanzania to the south, Uganda to the west, South-Sudan to the north-west and Ethiopia to the north and Somalia to the north-east (GoK, 2015).

Kenya has met a few of the Millennium Development Goals targets and has the potential to be one of Africa's great success stories from its growing and youthful population, a dynamic private sector, a new constitution, and its pivotal role in East Africa (World Bank, 2015c). This can be realised if the country addresses challenges of poverty, inequality, governance, low investment and low firm productivity to achieve rapid, sustained growth rates. Devolution

is a challenge, but also an opportunity for greater distribution of economic opportunities across income groups and regions (World Bank, 2015c). Government pursued strategies geared towards furthering good governance such as enactment of Security Laws (Amendment) 2014, continued reforms in the Judiciary and law enforcement agencies and increased budgetary allocation to national security and justice sectors (Kenya National Bureau of Statistics Economic Survey, 2015).

Government of Kenya Draft National Policy for Disaster Management (2009) points out that Kenya's disaster profile is dominated by fire, floods, terrorism, technological accidents, diseases and epidemics that disrupt people's livelihoods, destroy infrastructure, divert planned use of resources, interrupt economic activities and retard development.

Statement of the Problem

Over the years, Kenya's participation in the disaster risk reduction dialogue has grown tremendously (NDOC, 2015). Further, the country's disaster profile includes natural disasters such as drought, famine, flooding, landslides, and epidemics, and man-made disasters such as traffic accidents, fires, terrorism have claimed numerous lives.

Although there is awareness on the nature of disasters, little research has been carried out on disasters and sustainable development. The current study bridges this knowledge gap by establishing if current disaster management efforts address sustainable development and protection of information materials.

Aim and Objectives of the Paper

The aim of the study which yielded this chapter was to investigate sustainable development, disaster management and protection of information materials in Kenya with a view to determining current status and propose relevant recommendations to integrate sustainable development and disaster management in Kenya. The specific objectives of the study were to:

1. Find out disasters likely to affect Kenya;
2. Establish if disaster management activities are linked to sustainable development;
3. Determine the application of information communication technology in disaster management;

4. Establish challenges faced in undertaking disaster management activities; and
5. Propose recommendations on how to integrate sustainable development in disaster management initiatives

Research Questions

The study was guided by the following research questions:

1. What is the nature of likely disasters in Kenya?
2. To what extent is disaster management activities linked with sustainable development?
3. What is the extent of the use of information and communication technology in disaster management?
4. What challenges are faced in conducting disaster management activities?
5. How can these challenges be addressed?

Originality

The chapter integrates reports, views and insights of United Nations organisations and institutions that are core in efforts to promote disaster management and sustainable development. Further, it highlights the views of government-based organisations that have evolved best practice in dealing with various disasters. There is little research on sustainable development and disaster management in Kenya. The current chapter supplements previous researches and seeks to create awareness on the need to integrate sustainable development and effective management of disasters. The author hopes that the current study will lead to basic and applied research on sustainable development, disaster management and protecting information materials. The author is of the view that the study will be beneficial to various state actors, policy makers, academia, researchers and international development agencies and partners who have interest in sustainable development and disaster management initiatives in Kenya.

Study Scope and Limitations

Various actors are involved in disaster management activities in Kenya. They include the National Disaster and Operations Centre (NDOC), Ministry of Interior and National Coordination, the Kenya Red Cross, Kenya Defence Forces, the Kenya Police Service, Ministry of Health, Ministry of Transport and Infrastructure and, National Youth Service. The current study is informed by data collected from the NDOC, whose mandate is to coordinating disaster management and promote sensitization and awareness activities. It is proposed that institutions involved in disaster management activities that were not included in the present study constitute a subject of further research.

Methodology

Data collection methods may include the use of interviewing, surveying, document analysis, and observation (O'Leary 2005). The author used an interview guide to collect data supplemented by literature review. Among the purposes of a literature review is to share with the reader, the results of other studies that are closely related to the one being undertaken, relate study to the larger, ongoing dialogue in the literature, fill gaps and extend previous studies (Creswell 2009).

Interview was conducted with a key informant from Kenya National Operations Centre. The interview guide consisted of ten (10) open-ended questions which were posed to the respondents seeking data relating to study objectives. The author used face-to-face, one-on-one interview technique, which enabled him to control the line of questioning (Creswell 2009). Responses received were recorded as notes. Data sourced from interview was reported thematically and integrated with literature review findings.

Theoretical Framework

The chapter is informed by the Hyogo Framework for Action 2005-2015 (United Nations International Strategy for Disaster Reduction 2005a). The author acknowledges that the United Nations has adopted the Sendai Framework for Disaster Risk Reduction which recognises the importance of community level engagement in disaster risk reduction (United Nations Office for Disaster Risk Reduction 2015a).

According to United Nations International Strategy for Disaster Reduction (2005a), the Hyogo Framework for Action (HFA) is the key instrument for implementing disaster risk reduction adopted by the member states of the United Nations. Its goal is to build resilience of nations and communities to disasters by achieving substantive reduction of disaster losses by 2015.

Implementation of the HFA plan involves states, regional organisations, international organisations and the international strategy for disaster risk reduction system. HFA has five areas of priority for action for achieving disaster resilience for vulnerable communities in the context of sustainable development. The priority areas are making disaster risk reduction a priority, knowing the risks and taking action through knowledge of risks faced; building understanding and awareness; reducing risk and being ready to act through the development and regular testing of contingency plans (United Nations International Strategy for Disaster Reduction, 2015a).

A new development is the Sendai Framework for Disaster Risk Reduction 2015-2030 was adopted at the Third World Conference on Disaster Risk Reduction held from 14 to 18 March 2015 in Sendai, Miyagi, Japan (United Nations Office for Disaster Risk Reduction, 2015). Taking into account the experience gained through the implementation of the Hyogo Framework for Action, the Sendai Framework for Disaster Risk Reduction (2015) is based on the following four priority areas:

1. Understanding disaster risk;
2. Strengthening disaster risk governance to manage disaster risk;
3. Investing in disaster risk reduction for resilience; and
4. Enhancing disaster preparedness for effective response, recovery, rehabilitation and reconstruction.

The author opted to use the Hyogo Framework for Action 2005-2015 to inform the study since the issues articulated in the framework constitute a summarised version of the Sendai Framework for Disaster Risk Reduction 2015-2030.

The HFA 2005-2015 is relevant to this chapter because it links sustainable development with disaster risk reduction. The priority areas captured by the framework are reflected in the study objectives and findings. Further, the HFA is a United Nations document developed through consensus which provides

best practice framework for managing disasters for effective sustainable development. Given the important role of information for sustainable development, the framework provides an avenue for securing information materials through the actions of various actors.

Findings and Discussions

The section presents findings and discussions from interview data and literature review as indicated below.

Disaster Likely to Affect Country (Kenya)

Question one sought to establish the mandate of the National Disaster Operations Centre and disasters likely to affect country. When asked to indicate its mandate, respondent gave the following views:

“Monitor all disasters on twenty four hour weekly basis”.

When probed further, the respondent revealed that when a disaster occurs, it is handled by an emergency operations centre managed by line ministries, The Kenya Police Service, Kenya Defence Forces, Ministry of Health, National Youth Service and Ministry of Transport and Infrastructure.

On propping respondent gave an example of the Ministry of Health which provides emergency medical teams when a disaster occurs. It was also established that NDOC mandate involves:

“Coordinating disaster management activities”

“Sensitizing and awareness activities”

The respondent gave the example of sensitisation talks carried out in various universities in the wake of the terror attack on students at the Garissa University College in April 2015. The talks were held at the University of Nairobi, Mount Kenya University and Egerton University. The NDOC also visited churches and county governments to provide sensitisation talks.

“Collaboration and networks with stakeholders such as United Nations agencies and emergency service teams such as St. John’s Ambulance”

When asked to explain the nature of collaboration and networks, the informant gave the example of collaboration and networking involving road accident and fire victims, structural collapse of buildings, and victims of drowning. The respondent also gave the example of the incident when

three people drowned in Lake Naivasha and Kenya Navy divers were called to help retrieve the bodies. Nonetheless, the respondent could not recall the date, month and year when incidents took place. Another mandate cited relates to:

“Coordination of disasters at national level”

In this regard, the respondent gave example of the fire outbreak at the Jomo Kenyatta International Airport, Nairobi in March 2014 and the Westgate Mall terror attack in Nairobi. The NDOC translates the decisions of National Disaster Coordinating Committee (NDDC) into actions. When probed, the respondent revealed that the NDCC is chaired by the Principal Secretary, Ministry of Interior and Coordination of National Government while other members include Inspector-General of Police, Director, National Intelligence Service, and Chief of Defence Forces.

“Prepare inventories on disaster resources in the counties, for example, existence of fire engines”

Question two required the respondent to indicate if there were disasters likely to affect the Country. The respondent indicated that there are natural and man-made disasters which are likely to affect Kenya. The respondent provided the following as possible natural disasters in Kenya:

“Floods and earthquakes”

“Tremors”

“Diseases”

“Lightning strikes in Western Kenya”

The possible man-made disasters were identified as below:

“Fires”

“Road traffic accidents”

“Terrorism”

“Civil conflicts arising from cattle rustling prone areas”

“Border disputes”

“Computer related cyber crimes”.

The key informant further indicated that NDOC lacks the capacity to deal with computer or cyber crimes and this is usually handled by the Kenya Police.

The third question required the respondent to indicate among the disasters listed above, the ones likely to affect information materials. The response was that most of the disasters can affect information materials. He gave the example of computer crimes which led to the hacking of the Ministry of Defence and The Kenya Police websites in 2013.

The United Nations Development Program (undated) profile of disasters in Kenya indicates that Kenya experiences a number of natural hazards. The most common of these are weather related. They include floods, droughts, landslides, lightning/thunderstorms, wild fires, and strong winds. Other hazards experienced in Kenya include HIV/AIDS and conflict. The findings from literature review confirm the interview data regarding the profile of disasters in Kenya. United Nations International Strategy for Disaster Risk Reduction (2005b) Republic of Kenya Country's Position Paper on Risk Reduction established that the country had been exposed to a variety of disasters such as drought, floods, fires, and emerging disasters including HIV/AIDS and terrorism. It is evident that literature corroborated the interview findings. However, it is also evident that some of the disasters cited by the key informant were not reported in the literature. These included border disputes, civil conflicts arising from cattle rustling areas and road traffic accidents.

Information resources face potential threat from various disasters such as natural hazards, environmental, political, incitement and technology related (Millar 1999). Further, electronic records may be affected by various disasters such as natural events, technological disasters, criminal behavior, accidental loss and unstable storage conditions (National Archives of Australia, 2015).

Data from the key informant interview identified computer crimes as one of the disasters likely to affect country. High-tech crimes include cyber-terrorism, espionage, computer intrusions and major cyber fraud (Federal Bureau of Investigations, 2015). Security of information resources ensures good data management, protects information against damage, loss and theft and protects the ICT equipment and systems used to collect, store and process information (Newcastle University, 2012).

A new form of threat relates to non-secure cloud computing since the service may be located in a country with no data protection law (Newcastle University, 2012). Cloud computing can be described as a combination of virtualisation servers providing scalable services, applications, storage and infrastructure for multiple clients over the Internet (Australian Computer Society, 2015).

However, during the interview, the informant did not provide details or examples of the nature of computer crimes. Literature points out that unlike physical threats that prompt immediate action, cyber threats are often difficult to identify and understand. They include viruses that erase entire systems, intruders that break into computers and alter files, using one's computer to attack others, or intruders stealing confidential information from one's computer (New Hampshire Government, 2015). To respond to computer crimes/threats, many countries worldwide have formed cybercrime units. For example, the United Kingdom established the National Cyber Crime Unit which among others leads the UK's response to cybercrime (National Crime Agency, 2015).

Literature documents some of the measures to protect information and secure computer networks and hand-held devices. These include connecting to the Internet over secure, password-protected networks, not responding to online requests or personal identification information, enacting ICT policy, use of encryption, and cloud computing (Newcastle University, 2012; New Hampshire Government, 2015).

Disaster Management and Sustainable Development

Question four sought to determine if disaster management activities are linked with sustainable development. The key informant responded in the affirmative and observed as follows:

“Government is concerned with sustainable development in all fields”.

The respondent cited the example of a circular from the Ministry of Interior and National Coordination to all ministries to mainstream disaster risk reduction in their plans, policies, projects and advocacy and involve all citizens. The informant further observed as follows:

“We currently collaborate with the county governments through the Council of Governors which have focal points in the counties”.

The author also sought to establish if disaster management activities are linked to risk management. The informant noted that disaster reduction lessens the impact and gave examples from the four phases of disaster management namely: preparation, response, recovery and post-recovery.

On whether disaster management activities are linked with the attainment of Kenya Vision 2030. The informant responded in the affirmative and stated as follows:

“Kenya Vision 2030 is one of the key areas of disaster management. It addresses areas covered by Sendai Framework 2015-2030”

Literature confirms the assertions of the informant that disaster management is linked to development and that; “the government is concerned with sustainable development in all fields.”

United Nations Development Program (2004) noted that natural disasters exert enormous pressure on development and pose a significant threat to prospects for achieving the Millennium Development Goals, in particular, the overarching target of halving extreme poverty by 2015. Further, natural disaster risk is intimately connected to processes of human development. United Nations Development Program (2004) report on reducing disaster risks identifies development factors that contribute to risk, and shows in quantitative terms, how the effects of disasters can either be reduced or exacerbated by policy choices.

There is a link between sustainable development and disaster management (United Nations Office for Disaster Risk Reduction, 2015b). The organisation points out that disaster risk reduction is an integral part of social and economic development, and is essential if development is to be sustainable for the future. Further, making development sustainable requires addressing natural hazard risk and vulnerability in development plans. Natural hazards such as earthquakes, cyclones and droughts pose significant threats to achieving and sustaining development plans goals. Further, the Sendai Framework for Disaster Risk Reduction indicates link between disaster risk reduction and sustainable development goals (United Nations Office for Disaster Risk Reduction, 2015c). From the literature cited, it can be pointed out that addressing disasters is of central importance to achieving sustainable development in Kenya.

Application of Information Communication Technology in Disaster Management

The author also sought to determine the application of Information and Communication Technology in disaster management activities. When asked to comment on this, the key informant noted as follows:

“ICTs come handy during disaster preparation phase for sensitisation and awareness such as radio, television, Internet and social media”. The respondent further gave the following examples:

“Director National Disaster Operations Centre hosted by Kenya Broadcasting Cooperation to give a talk on fire awareness”

“Director National Disaster Operations Centre visited Nation Television to give a talk on disaster risk reduction before attending World Conference on Disaster Risk Reduction, Sendai, Japan.”

The respondent did not recall the specific dates when Director NDOC visited the two television stations. In addition, the interviewee stated that email is used to communicate with county governments while rapid assessment teams when in disaster scenes, take photographs which are relayed to headquarters. Furthermore, the United Nations Development Program had donated a “des-Inventar Information System” for archiving data relating to disaster incidents. The database can be accessed online.

When asked if the organisation applied Geographical Information Systems, the interviewee recorded “no” response. When further asked if satellite communication technology is applied in disaster management, information reported a “no” response. However, interviewee noted that satellite communication would be useful given that some parts of Kenya are not covered by mobile telephone networks”. The respondent was further asked if drones are applied in disaster management. A “no” response was recorded. On further probing, it was established that drones are only used by the Kenya Defence Forces and are stationed in Nanyuki.

Literature search reveals science and technology can reduce or prevent disasters and deliver outputs in areas such as assessment, synthesis, scientific advice, monitoring and review, communication and engagement, and capacity development (United Nations Office for Disaster Risk Reduction Report on Science and Disaster Risk Reduction, 2015d). According to Organization for Economic Cooperation and Development (2012), science and technology play an increasingly vital role in managing natural disasters and catastrophes in various countries as shown in Table 2.

Table 2: Adoption of New Technologies to Tackle Disasters (selected countries)

Improved seismic surveillance networks	Australia, Canada, Colombia, India, Indonesia, Italy, Japan, Turkey, United States
Improved Tsunami early warning and monitoring	Australia, Canada, Colombia, India, Indonesia, Italy, Japan, Turkey, United States
Improved telephone based information and warning capabilities	Australia, Austria, Estonia, Italy, Japan, Luxembourg
County members of the International Charter on 'space and major disasters' for sharing data from satellites in case of disasters	Algeria, Argentina, Brazil, Canada, China, France, Germany, India, Japan, Nigeria, Korea, Turkey, United Kingdom, United States and European Space Agency

Source: OECD (2012)

Remote sensing for earth observation, satellite-based telecommunication and global navigation satellite systems contribute to more effective disaster risk management and emergency response (United Nations Office for Outer Space Affairs, 2015b). Another technology for disaster management is social media. According to White (2014), social media can be applied before, during and after disaster as shown in Table 3.

Table 3: Disaster Phase, Social media and Application

Disaster Phase	Social Media and Related Technology	Application
Before Disaster	Face book, Twitter, You Tube	Informing public, showing public where to access information, give public confidence, update public
During Disaster	Face book, Twitter, You Tube	Government authorities and disaster response organisation communicating with public in quick and efficient manner
After Disaster	Face book, Twitter, You Tube	Reunite families, inform the public of recovery efforts, assure survivors of support, provide information and links to charitable organizations

Source: Constructed from White (2014)

A recent development is the use of drones for disaster response and relief operations (American Red Cross, 2015). Drones provide needed aerial data in areas considered too hazardous for people on the ground or for manned aircraft operations; reconnaissance and mapping; structural integrity

assessment; temporary infrastructure; supply delivery; wildfire detection and extinguishing; high-rise building fire response; chemical, biological, radiological, nuclear or explosive events; search and rescue operations; and logistics support (American Red Cross, 2015). The benefits of drones in an emergency are reach, speed, safety, and cost. Drones can fly through the dark and live-stream night-vision footage to people on the ground (CNN, 2015). For instance, an aerial footage filmed by a drone showed devastation caused by earthquake in Nepal (BBC, 2015).

Interview data reveals that some of the ICTs applied for disaster management include radio, television, Internet and social media. The study established that NDOC uses des-Inventar disaster management information system which allows the systematic collection, documentation and analysis of data about issues caused by disasters associated with natural hazards (United Nations International Strategy for Disaster Reduction, 2015c).

Interview data further established that Geographical Information Systems, and satellite communication technology are not applied in disaster management. Further, the respondents indicated that drones are not used for disaster management but for military purposes only.

Establish Challenges Faced In Undertaking Disaster Management Activities

The author sought to establish the challenges faced in conducting disaster management activities. The following are verbatim responses:

“Insufficient resources; we are an agency within the Ministry of Interior and Coordination of National Government. Funding is low”

“No personnel in the counties. We rely on County Commissioners and the Kenya Police. It is part of their business but not their core business”

“We are operating on a draft policy which has not been approved by Cabinet”

“We are not directly funded by Treasury”

A report by the United Nations International Strategy for Disaster Risk Reduction (2005b) Republic of Kenya Country’s Position Paper identified certain priority areas in order to strengthen the country’s efforts in risk and vulnerability reduction namely:

1. Political commitment and institutional aspects – for example, extent to which country’s policies and bills on disaster management are dynamic;
2. Research– articulating a research agenda for risk reduction, identification, targeting and mainstreaming disaster concepts and management;
3. Information dissemination– package and disseminate information at the grassroots level and linkages between risk reduction and national disaster management plan is clarified and disseminated to all stakeholders from time to time;
4. Resources mobilisation and sharing on priority basis;
5. Capacity building by involving professionals in disaster management structures and the level of involvement.

Some of the priority areas cited by United Nations International Strategy for Disaster Risk Reduction (2005b) constituted verbatim responses by the key informant, for example, “insufficient resources”, and “resource mobilisation”. However, the aspect of collaboration with universities was highlighted by the informant as a recommendation.

The literature confirms that Kenya has a draft policy for disaster management (GOK, 2009). The draft policy aims at establishing and strengthening disaster management institutions, mainstreaming disaster management in the development process; increase and sustain resilience of vulnerable communities to hazards through diversification of livelihoods and providing timely and appropriate response mechanisms for disaster victims (GOK, 2009).

Proposed Recommendations on How to Integrate Sustainable Development in Disaster Management Initiatives

The key informant provided the following recommendations:

“Awareness programmes by the Ministry of Interior and National Coordination and Kenya Institute for Curriculum Development for primary and secondary schools”

“County governments to establish disaster management units”

“Collaboration with universities”

“Passage of proposed policy for the establishment of the national disaster management agency currently at Cabinet for consideration”

“Collaboration with Regional Centre for Mapping of Resources for Development based at Kasarani, Nairobi and the Department of Remote Surveys and Remote Sensing on Mombasa Road which have equipment and satellites to do hazard mapping”

The informant indicated that the institution collaborates with other countries such as Tanzania, Burundi and Rwanda on disaster planning and preparedness and cited exercise undertaken in Mombasa, Kenya in June 2014.

The author makes the following recommendations:

1. Integrate disaster management activities with sustainable development in Kenya;
2. Utilise ICTs in disaster management activities such as social media, radio, mobile phones, and drones. However, there is need to assess opportunities and challenges afforded by these technologies;
3. Provide resources in terms of finances, personnel, training and equipment such as satellite phones given that some areas of the country are remote and not covered by mobile phone service providers;
4. The cabinet should approve the draft national disaster management policy and have policy operationalised to provide policy and strategic direction with regard to disaster management activities in Kenya;
5. Create and empower NDOC units in the counties;
6. Collaborate with universities to enhance curriculum development, content, delivery, basic and applied research output and dissemination of research findings; and
7. Emphasise the new and emerging forms of disasters such as terrorism,

Suggestions for Further Research

This chapter identifies the following topics for further research:

1. Research on the role of other actors in disaster management activities in Kenya;
2. Research on how the protection of information materials from disasters contributes to sustainable development;

3. Research on ICT applications in disaster risk reduction to include strengths, weaknesses, opportunities and threats.
4. Development of a database of completed and on-going basic research in disaster management conducted in universities to make it available to inform policy directions as well as practice.

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Aligning Records Management to Service Delivery at Moi University, Eldoret, Kenya

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Abstract

Governments as well as non-governmental organisations are increasingly realising that sound records management is linked to service delivery. However, Moi University is yet to fully realise the role of records management to quality service delivery. This is due to a lack of policy frameworks on the management and disposal of records as well as inadequate records staff, among others. This chapter emanated from a study which investigated the role of records management in enhancing the quality of services at Moi University and suggested possible strategies for improvement. The objectives of the study were to: find out the business processes of Moi University and the records generated; establish the extent of integration of Information Communication Technologies (ICTs) in records management and its contribution to quality service delivery; identify the challenges encountered in the management of records; and suggest strategies to improve records management so as to enhance the quality of services in Moi University. The authors utilised a comprehensive Service Quality Gap Model and the Records Continuum Model. The authors used mixed methods research design. Data were collected from 50 respondents drawn from Moi University through face-to-face interviews and questionnaires. Qualitative data were analysed thematically while quantitative data were analysed using descriptive statistics. The key findings were that the university generates diverse records in the course of their business functions but their effectiveness has been undermined by poor record keeping practices and inadequate application of ICTs which affects the quality of service delivery. It is recommended that the university should develop a comprehensive records management programme and policies; integrate ICTs in the management of records; employ adequate qualified records management personnel; and conduct a records survey to understand the university's records environment. The authors conclude that the quality of services delivered by Moi University is affected negatively by the poor state of its records.

Keywords: *Records, records management, Moi University, Kenya, service delivery*

Introduction

The importance of records to governments, organisations and individuals across the globe cannot be overstated especially in this information age. For an organisation to effectively and efficiently discharge its mandate, records are vital regardless of the form in which they are produced. Swan, Cunningham and Robertson (2002) state that proper record keeping is critical for the survival and efficient operation of day-to-day business activities of an organisation. Every business activity carried out or service provided generates records. Therefore, records are the main source of information and the tools with which an organisation's business is transacted. According to Lucian (2003), records, have value and add to the intrinsic worth of an organisation. For this reason, proper management of records is necessary for their continued use and access for business purposes.

The term record has been defined by many scholars and organisations. Cox (2001) defines a record as an extension of human memory, purposefully created to record information, document transactions, communicate thoughts, substantiate claims, advance explanations, offer justifications and improve lasting evidence of events. The International Council on Archives (ICA) on electronic records (2005) on the other hand, defines a record as recorded information produced or received in the initiation, conduct or completion of an institutional or individual activity and that comprises content, context and structure sufficient to provide evidence of an activity.

In the context of this chapter the authors have adopted ISO 15489-1:2001(ISO, 2001) definition of a record. It defines a record as information created, received and maintained as evidence by an organisation or a person in pursuance of legal obligations or in the transaction of business. This implies that an institution in its business functions creates records. As Shepherd and Yeo (2003) opine, records may be created either in the course of an activity or afterwards in a conscious act of record keeping.

This chapter also adopts the definition put forth by ISO 15489-1:2001which defines records management as a field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use and disposal of records including process of capturing and maintaining evidence of information about business activities and transactions in the form of records (ISO, 2001).

According to ISO 15489:2001, records management enables any organisation to conduct business in an orderly, efficient and accountable manner. This enhances the delivery of services in a consistent and equitable manner, support and document policy formation, aid managerial decision making, provide consistency, continuity and productivity in management and administration; and facilitate the effective performance of activities throughout an organisation.

According to Shepherd (2006) one of the reasons for keeping records is that organisations use the same to support accountability when they want to prove that they have met their obligations or complied with best practices according to the established policies. This sentiment is supported by Ngoepe (2004) and Thurston (2005) who state that in the absence of functional records management, decisions are made without full information.

Thurston (2005) acknowledges that there is a link between good records management and service delivery. As a key component of public service reforms, good recordkeeping has contributed towards efficiency and effectiveness especially in those countries where as part of public service reforms there was a component on records management improvement. Smith (2007) notes that in the delivery of services, records management plays an important role in documenting policies and statutes carried out, services provided, who carries out the work and how much it costs.

Universities have a mandate to understand service specifications versus service delivery. This can enable the institution to understand the result of role ambiguity and conflict, poor employee-job fit and poor technology-job fit, inappropriate supervisory control systems, lack of perceived control and lack of teamwork which may affect quality service delivery (Parasuraman *et al.*, 1985; Gronroos, 2000). Further Parasuraman *et al.* (1985) and Gronroos (2000) explain that to overcome a service delivery gap, there should be emphasis on providing employee training, clarifying the tasks of all personnel to avoid task ambiguity and making proper changes to technology and systems so that they can be supportive to the quality goal.

Moi University is an institution of higher education which carries out various activities. These include provision of knowledge and conferring credentials, among others. All these activities generate records. According to Ngoepe (2004) sound records management is the heart of good public management since government services are dependent on access to information.

Thurston (2005) observes that the state of records in many African countries remain far from satisfactory because officials suffer embarrassment on daily basis when they find themselves unable to take action where necessary due to lack of requisite information.

Quality service provision is achieved through a sound records management. Kanzi (2010) affirms that a sound records management programme is the foundation for managing resources and the delivery of the services to the public, transparency, which is symbolised by timely access to information and accountability.

Many African government departments seem to be having numerous challenges in service delivery due to the following records-related factors:

- Lack of effective systems for opening, tracking and indexing files (Ngulube & Tafor, 2006);
- No records safety (Ngulube & Tafor 2006; Nengomasha, 2009);
- Lack of effective training, legal and regulatory tools for management of e-records (Nengomasha, 2003);
- No proper capturing and preservation of records (Wamukoya & Mutula, 2005);
- Lack of knowledge about the essential elements of electronic records management (Wamukoya & Mutula, 2005);
- Missing files and documents that delay service delivery to the public (Kemoni and Ngulube, 2008);
- Inadequate records keeping practices and difficulty to trace the movement of records (Kemoni & Ngulube, 2008);
- Lack of core competencies in records management (Nengomasha, 2009);
- No budget dedicated specifically for records management (Nengomasha, 2009); and
- No plans for managing e-records (Nengomasha, 2009).

Statement of the Problem

Organisations generate many records in the course of their business activity and transactions, so is the case of Moi University. The expansion of Moi University in terms of units, departments and schools generates massive records. The level at which these records are accumulating put a lot of strain on the records management system hence poor records management practices. This in turn has an effect in the provision of quality services in the university. Having sound records management practices in place may offer tangible business gains by granting an organisation greater control over the information which it holds. According to Shepherd and Yeo (2003) any organisation managing records should have a strategic function with a continuing programme that is effective across the organisation as a whole.

Moi University is an ISO 9001:2008 certified institution. The standard emphasises the importance of quality service provision including records management related services. However, this is not the case since records management has not received adequate and desired attention. According to a report presented on the implementation of ISO 9001:2008 Quality Management System during Moi University's non-teaching heads of departments meeting held on Tuesday 26th June, 2012 and ISO 9001:2008 Surveillance Audit Report on Moi University-Main Campus conducted by KEBS between 9th -11th October 2013 various aspects of poor records management were highlighted. These included poor filing practices, lack of record folios, wrong labelling of documents, lack of records security and poor documentation were highlighted as part of ISO non conformities.

In this regard the authors decided to conduct a study to investigate the role played by records management in enhancing the quality of services in Moi University with an aim of suggesting possible strategies for improvement.

Objectives of the Chapter

1. Find out the business processes and the records generated at Moi University;
2. Establish the extent of integration of ICTs in records management and its contribution to quality service delivery;
3. Identify the challenges encountered in the management of records and
4. Suggest strategies to improve records management so as to enhance the quality of services in Moi University.

Methodology

The authors employed a case study research design. A case study seeks to describe a unit in detail, in context and holistically (Kombo & Tromp 2006). The research employed both qualitative and quantitative approaches. The study population consisted of 111 respondents drawn from Moi University main campus in Kesses Division, Eldoret. The study population comprised six (6) top management representatives, thirty (30) action officers, six (6) records supervisors, four (4) auditors, forty (40) records staff and twenty (20) secretaries.

The population was drawn from various departments namely: University Management; Division of Deputy Vice Chancellor, Academic, Research & Extension; Quality Management System & ISO Compliance department (QMS& ISOC), Quality Assurance (QA); Dean, Student Affairs; Health Services Registry; Financial Services; and Central Registry System. The authors employed purposive sampling to select the actual respondents to ensure quality data collection.

A sample size of 56 respondents comprising six (6) top management representatives, fifteen (15) action officers, six (6) records supervisors, four (4) auditors, twenty (20) records staff and five (5) secretaries was selected from the population.

Table 1: Study Population and Sample size (n=56)

Respondents	Total population Response	Sample size	Percentage Sample size (%)
Top management representatives	6	6	100
Action Officers	30	15	50
Records supervisors	6	6	100
Auditors	4	4	100
Records staff	40	20	50
Secretaries	20	5	50
Total Targeted Population	111	56	51

The authors utilised both primary and secondary data. Primary data was obtained from face-to-face interviews and self administered questionnaires. Documentary review included official reports from KEBS and internal audit reports.

Findings and Discussions

The findings of the study are presented and discussed hereunder according to the themes and objectives of the study.

Business Functions and the Records Generated at Moi University

All the 56 respondents (100%) stated that teaching, research and extension as the core business functions of the university. Management representatives who constituted 6 (11.1%) of the sample size stated that they were involved in strategic planning, for instance expansion, renovation and employment; mobilisation of resources through resource funding and investments; policy formulation and implementation; review and monitoring of decisions approved by council; advising the council and government on matters concerning the institution; public-private partnerships; and implementing of vision 2030 flagship projects. The records generated or received out of these activities, according to the respondents, included:

- Personnel records such as those pertaining to employment, staff development, and disciplinary issues.
- Students' records such as population, performance, welfare and disciplinary issues.
- Administrative records.
- Financial records such as grants, research funds, budgetary records, salary payment, statements of accounts, fees payment, reports, and expenditure receipts.
- Architectural records such as maps and building plans.
- Performance contract reports.
- Internal and external audit reports.
- Committee records such as minutes.
- Records of collaborations and memoranda of understanding.
- Records from communication to and from the ministry.

Auditors who constituted four (7.1%) of the sample size identified the records they generate as financial, students', personnel, administration and accommodation records. Six respondents (11.1%) who were records supervisors said they generated and received personnel, administrative, financial, correspondences, minutes, academic, legal records, among others.

The study also targeted action officers in the institution. These comprised registrars, deputy registrars, senior assistant registrars and administrative assistants. Constituting 15 (26.9%) of the sample size, they stated that they generated administrative, financial, personnel, expenditure, staff appraisal medical, students welfare, curriculum development, and, performance contract records.

On the other hand, records staff who constituted 20 (35.7%) of the sample size identified the records generated as comprising reports, students administrative and budget allocation records. Lastly, the 5(9%) secretaries, stated that the records created included reports, minutes, personnel, administrative records budget, requisition, notices and other correspondences.

Moi University generates vast amounts and varieties of records confirmed by the views of Wamukoya (2000) who states that records are a by-product of business activity. Shepherd and Yeo (2003) also added that records may be created either in the course of an activity or afterwards in conscious act of record keeping.

The Extent of Integration of ICTs in Records Management and Its Contribution to Quality Service Delivery at Moi University

The authors sought to find out how ICT is integrated in records management process and their contribution to quality service delivery. The 6 (11.1%) management representatives pointed out that, application of ICTs in records management in the university is not yet fully implemented. Documents and records were managed manually.

One of the management representatives stated that: *"integrated financial management system is the only system in place which manages processes and records in finance department. Another respondent stated that: 'the university has invested in a student's hostel booking system which students use to book hostels and it helps the university to have clear records of students who stay on campus and off campus.'*

Two of the respondents (3.36%) indicated that the university is connected to the Internet which facilitates information sharing through e-mails within and without though the level of ICT use is still low in managing records in the university. All the 4 (7.1%) auditors revealed that ICTs have been applied partially in the management of records in the university. They stated that, all the records generated in departments are managed manually.

Four (7.1%) records supervisors said that ICTs were not integrated with services and personnel records. The central registry uses a manual system in managing personnel and administrative files. One of the respondents stated as below:

“The few computers in the central registry have only information about the total number of permanent staff, and their employment numbers”

All the 15 (26.9%) action officers were of the view that the application of ICTs in records management in the university is not yet up to the standard required. One of the respondents stated that:

“Most of the members of staff are computer literate and use computers to do their official duties such as writing letters, reports, and memos among others though all the records are managed manually”

The records staff who constituted 20 (35.7%) of the sample size concurred that ICTs were not integrated in the records management function in the university. All the secretaries 10 (5.6%) pointed out that ICT was not integrated with records management apart from storing memos and reports on the hard disks, flash disks, and using the Internet for information sharing within and without departments.

In regard to ICTs' contribution to improving the management of records in support of quality service delivery, all 56 respondents (100%) were of the opinion that if embraced effectively, ICTs could:

- assist in providing relevant, complete, accurate and timely information extracted from records, leading to enhanced decision making and prompt service delivery to clients;
- facilitate and improve storage and easy retrieval of records, dissemination of information and provision of backup facilities;
- aid in report writing, data processing, information sharing, identify gaps in service delivery;

- help in digitisation of personnel records thus facilitating and improving storage and retrieval and allowing sharing of information with clients;
- enhance communication, reduce paper work and produce well-maintained files;
- minimise loss or theft, wear and tear, and save on storage space thus promoting and improving efficiency and effectiveness in records management;
- improve and enhance processing tasks such as appointments, promotions and retirements caused by gaps in the use of a manual system;
- enhance accessibility of information, reduce misfiling and enable file tracing and tracking;
- make up-to-date information on employees available;
- provide audit trails and encourage data backup;
- ensure security of records by use of strong passwords, encryption and installation of the right antivirus software; and
- facilitate proper maintenance of records thus enhancing efficiency and effectiveness in decision making and quality service delivery to clients.

Challenges Encountered in the Management of Records and how they Impact On Quality Service Delivery

It was established that there are myriad challenges affecting records management in Moi University. From the findings, the respondents mentioned lack of a records management policy to provide guidelines for the control and use of records, identification and protection of vital records, establishment of records control systems and procedures including classification, storage, maintenance, tracking and disposal.

The authors established that records were managed largely by unqualified records staff leading to poor record keeping, misfiling, loss of records, poor handling of files and lack of tracking of files. These have brought about non-conformities which have contributed negatively on the management of records. The challenges have also led to delayed service to citizens and poor image of the public service. Kemoni and Ngulube (2008), Bhana (2008), Kemoni and Ngulube (2008) state that poor recordkeeping can lead an organisation to risks such as poor organisational reputation, non-legal compliance, financial loss, and information loss.

The manual system of records management according to the respondents has brought about challenges in the management of records and service delivery. The manual system has led to slow or sluggish retrieval of records, loss of records, poor security and confidentiality of information and delayed decision making.

The findings further established that the records management element has not been well supported by the top management. This has been observed by Parasuraman *et al.* (1985) and Gronroos (2000) who concur that some gaps in the service delivery are due to lack of support from top management, inadequate funds to facilitate the purchase of the right equipment, lack of training, insufficient planning procedures. Jones (2003) notes that good records management practices is an investment for an organisation although it could be easily viewed as an overhead.

The respondents also pointed out that ignorance and lack of awareness of staff about the importance of records management is a setback to service delivery. It was further stated that the management of records was assumed to be a mandate of the secretaries and clerks who are assumed to be the custodians of records in the respective offices alongside other duties.

Generally, the study revealed a poor state of affairs for records management in Moi University. This concurs with Wamukoya and Mutula (2005) who concluded that there were real challenges eastern and southern Africa countries face in the capture and preservation of records.

Conclusion

The authors observed that Moi University creates vast and varied amounts of records in its day-to-day activities. The university manages its records manually. The authors also found that the university has not fully integrated ICTs in the management of its records. Further, the manual system reduces efficiency and effectiveness in the provision of services. There is need for a comprehensive records management programme and policies to mainstream the function in the core university activities.

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Section Five: E-Governance

The Role of Records Managers in Open Government and Open Government Data in Africa

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Abstract

Information and communication technologies (ICTs) have created myriad opportunities for accessing and utilising information resources held by the government. However, restrictive laws, policies and procedures continue to impede the rate at which citizens can access information held by governments. This chapter examines the twin issues of “Open Government” and “Open Government Data”. It shows that within Africa, the “Open Government Data” initiative has witnessed a steady growth over the past few years and that as of 2014, 21 countries had created their own data portals and were part of the Open Government Partnership movement. The authors argue that more than often records managers and other information professionals are not included in the management of Open Government Data initiatives and as a result the long-term preservation and accessibility of such data may not be guaranteed. The chapter begins by discussing the benefits of making government-held data freely accessible. It then outlines the role that records managers and other information professionals can play in the organisation and management of large amounts of data collected through open government initiatives. It concludes by recommending the engagement of archivists, records managers and other information professionals in the formulation and adoption of policies, standards and procedures that will guarantee the acquisition, storage and dissemination of information via open government portals.

Keywords: *Open government, open government data, freedom of information*

Introduction

Information communication technology (ICT) has been described as an umbrella term that includes any communication device or application. The term encompasses radio, television, cellular phones, computers, network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and e-learning (TechTarget, 2005). The value of ICTs was perhaps best summed by Ogunsola (2005:1) when he said, "ICTs are increasingly playing an important role in organisations and in society's ability to produce, access, adapt and apply information". Tale and Alefaio (2005) argue that ICTs present opportunities for recordkeeping in developing countries. These include enhanced retrieval systems and online search facilities, to name a couple. Opportunities for compact storage through electronic and digital storage devices are becoming more enticing to those responsible for records as they offer an alternative to bulky paper records that need a considerable amount of space for storage. On the other hand, Burns, Ferris and Liatsopoulos (n.d) argued that ICTs can represent an opportunity for developing countries to improve their records and information management systems by facilitating advanced information retrieval systems and providing online search functions to the public. They also provide the ability to store huge amounts of information in a relatively small physical space on servers. But perhaps the greatest opportunity that ICTs have offered is the ability of citizens to search and access vast quantities of data held by the government.

Methodology

This chapter is based on a review of literature on the subject of records management, open government and open government data. It arose out of the concern that many African countries are yet to embrace open government data initiatives and that in many cases the role played by archivists and records managers in the operation of open government data is either misunderstood or completely neglected. Journal articles and Internet sources were reviewed and the presentation below is based on this. The chapter was also influenced by the authors' interest in issues of access to information as well as the authors' positions as trainers in the field of archives and records.

The Role of Archivists and Records Managers

Records management is seen as that area of general administration that is concerned with achieving efficiency and economy in the creation, use and maintenance of records. ISO 15489-1:2001(E) defines records management as

the field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use, and disposal of records, including the process of capturing and maintenance of and information about business activities and transactions in the form of records. Ricks, Swafford and Gow (1992:26) saw the role of records managers in an organisation to include:

- 1) The creation and maintenance of records retention and disposition schedules;
- 2) The establishment of procedures for the timely disposal of records and information no longer needed to support the current business of the organisation;
- 3) The development and implementation of file classification systems;
- 4) Locating and organising records;
- 5) Preservation of the corporate memory of the organisation;
- 6) Training of records personnel; and
- 7) Application of information communication technologies in records management, monitoring their implementation and usage.

As can be seen from the above discussion, records personnel have a key role to play in the creation, storage, retrieval, use and final disposition of records and data when no longer required by an organisation. With the emergence of information communication technologies, the role played by records managers is increasingly diminishing yet their expertise is crucial in the collection, organisation, storage and retrieval of vast amounts of data that is being created in electronic format. ICTs have indeed opened new opportunities for records managers to be actively involved with information management. No wonder Arden (2012) argues that this is the era of opportunity for the profession to partner with colleagues in knowledge management initiatives in developing policies, procedures and standards and building effective electronic record keeping systems. Thus the roles of records management professionals are changing. They are no longer just custodians of file rooms who respond to requests for files and records. They do not simply collect and organise records. They are becoming partners on widely dispersed teams, implementing new technologies and developing strategies for information management to support better productivity and information sharing. A review of literature indicates that records managers are ill-prepared for the management of records born digital and in most cases are not involved in

any of the stages of the records life cycle leaving all aspects of managing electronic records to information communication technology experts.

Open Government and Open Data Defined

The OECD (2009) defines open government as the transparency of government actions, the accessibility of government services and information, and the responsiveness of government to new ideas, demands and needs. OECD (2009:12) further argued that:

Like so many other popular policy concepts, the term open government means different things to different people. For some, it simply means facilitating the flow of information from governments to citizens; exchanging old, closed decision-making practices for a system where citizens have a right to know what their leaders are doing. Today, however, the term is generally understood to have a broader meaning. It has become an all-embracing label for a more transparent, accessible and responsive governance system where information moves freely both to and from government through a multitude of channels. In such a system, sharing information is the norm within the public sector and significant resources, training and administrative procedures are devoted to the effective dissemination of knowledge and services.

Musiime (2013) argues that open governance is built on the principle of the universal right to access information on the conduct of government and it places its value in enhancing effective public oversight. It aims to open up government affairs (previously kept secret), to make it easier to scrutinise public officers and hold them to account. The argument is that access to government information enhances public participation and facilitates the audit of government actions. Wamukoya (2013) is of the view that open government is determined by the extent to which governments are able to disclose government-held information. This in turn enables citizens to participate effectively in the decision making processes of their governments as well as being able to hold them accountable for their actions. He further argues that open government can only be fully implemented where records are well maintained and are made available freely to citizens who need them. Wamukoya lamented that in many countries, open government data is often measured against the availability of information data sets held in government portals.

Open government data has been defined differently by different scholars. In its simplest meaning, open government data may be defined as data that is created and maintained by central government ministries, departments and government agencies and which is made freely accessible to the citizens. In other words, open government data is that information that has been generated through the use of public funding. As a basic principle such information ought to be made freely available to the citizens without any fees or restrictions on how the data will be used. A major criterion used in determining whether a government is open or not is the ability of the citizens to freely access and reuse the data obtained from the government in whatever purpose they may want to (Open Government Data, 2012).

Open government is premised on the understanding that data will be readily available to the public. With the increasing adoption and use of information technologies, government information holdings are in digital format. Robinson and Harlan Yu (2012) argue that in the past, open government was often confused with the disclosure of sensitive and confidential government-held information. At least this was the pattern in the 1950s and early 1960s. Today, open government is synonymous with the application of information technologies for the release of vast amounts of government-held information. Closely related to open government data is the idea of information being released to enable citizens to hold governments accountable for their actions. Robinson and Harlan Yu (2012) noted that although several countries have created government portals and uploaded large volumes of data, they are still not accountable to their citizens. It can therefore be argued that simply placing data on government portals and websites does not necessarily result in open government.

The surveyed literature indicates that there is a common agreement on what constitutes open data. For government-held information to be classified as falling under “Open Data”, it must meet the following criteria.

- 1) It must be freely available and accessible. Basically this suggests that the data should be easily obtainable without any restrictions imposed on it. For instance, the data should be accessible without the need for passwords or limitation as to who may access it or not.
- 2) It must be accessible without license. The ability to reuse the data without having to obtain formal authorisation from the creators of the data is another key determining factor of whether data is open or not.

- 3) It must be machine readable. In other words, the data should be usable without technological hindrances. The ability to manipulate the data obtained from the government portal in order to analyse it for various purposes is yet another criteria used to determine the availability of open government data.
- 4) It must be complete. Open government data should be complete and without gaps. Incomplete or inaccurate data will be of little value to those wishing to make use of it.
- 5) It must be primary. The public is in need of primary or original data and not data that have already been manipulated in any way.
- 6) It must be timely. What the public seeks for is data that are current and not dated. Data arising out of recent research or recent statistics are of great value if it can be availed through government portals.
- 7) Open government data should be non-discriminatory. This requires that the data should be availed to all those with a need to access it. Under no circumstance should one be denied access to open government data on the basis of their nationality, colour, gender, creed or age.
- 8) The data should be permanent. There is no point in placing data on a governmental portal if it will not be available and accessible over time. This is something that must be emphasised. Users should be able to access the data over and over again as the need arises.
- 9) It should be trusted. In order to guarantee that Open Government Data is trustworthy, it is a requirement that the data should be held in trusted digital repositories (Thurston, 2012:10).
- 10) There should be a presumption of openness. The availability of open government data is premised on the understanding that citizens have "the right to know". This right is often provided for under constitutional guarantees or under a separate Freedom of Information Legislation (Sunlight Foundation, 2010).

Heusser (2013) on the other hand defines open government data as data that is either produced, or managed by the government, and which is made openly available to third parties. Husser (2013) further emphasises the need for governments to formulate policies and strategies for implementing open government data initiatives arguing that open government data policy is the latest chapter of the transparency story. It is moving the paradigm from

access to public documentation towards access to public data; avoiding obsolescence; and keeping up to date our right to access public information that increasingly flows through a digital ecosystem. As can be seen from the foregoing, open government is about opening up vast amounts of government data freely and without restrictions for public inspection. Open government is inseparable from open government data. Open government only exists where mechanisms are in place to facilitate the public to access government data. Where access to government-held data is curtailed or restricted, then it cannot be said that there is open government. These aspects are inter-dependent. Open government cannot exist outside open government data whether this data is held in datasets or in government records and archives. It can therefore be concluded that open government data initiatives must be supported by an infrastructure of laws, policies, standards, procedures and people (Wamukoya, 2013).

However, open government can only be successfully implemented where sound policies and procedures as well as a team of competent staff in records and information management are available. Collected data must be organised and stored before it can be accessed and utilised. Disorganised data is often difficult to interpret and cannot be relied upon.

Data produced and held by governments has the potential to be used for different applications which include:

- 1) Culture: The government creates and holds large amounts of data relating to tribal histories, customs, and traditional medicines, among other issues. Some of this information is already held in national archival centres, national museums, libraries, documentation centres and research institutes.
- 2) Science: Scientific research centres such as agricultural research centres, medical research institutes as well as institutes of development studies hold vast amounts of data that may be used for research purposes. Such data may be used to determine trends in the prevalence of diseases or the effects of drugs applied.
- 3) Finance: Data such as government accounts (expenditure and revenue) and information on financial markets (stocks, shares, bonds) is critical in determining whether national resources are being utilised effectively for development purposes, determining the level of wastage, and in tracking levels of corruption and financial maladministration.

- 4) **Statistics:** Data produced by statistical offices such as the census and key socioeconomic indicators and is useful in determining population patterns, rural-urban migrations, opening of new schools and hospitals.
- 5) **Weather:** The many types of information used to understand and predict the weather and climate. This kind of information is of critical importance to farmers, shipping and air travel agencies.
- 6) **Environment:** Information related to the natural environment such as presence and level of pollutants as well as the quality and rivers and seas.
- 7) **Transport:** Data such as timetables, routes and on-time statistics.

Benefits of Open Government Data

Open data is not only about creating efficiency but it is about increasing transparency and accountability (Kenya Open Data, 2014). There are several benefits to be gained from opening up vast amounts of government held data. This is particularly so in developing countries especially those in Africa where such data is needed for the socio-economic development of the region. The value of open government data was perhaps best summed up by Ndemo (2012), the then Permanent Secretary in the Ministry of Information and Communications in Kenya, when he stated that there is no continent that needs open data more than Africa. This is a view that was supported by Africa Tracking Internet Progress (2014) when it asserted that open data has the potential to take African development to new levels of success. It further argued that the time has come for every African nation to provide the opportunity for citizens to understand more about their world. African governments have withheld information for too long. Honest data, even if it shows negative trends, is better than concealed data. Informed discussion between all levels of society is important. Truly sustainable development (which Africa greatly needs) simply is not possible without accurate data and targeted community involvement.

As can be seen from the above statements, data, whether it shows weaknesses and failures in government efforts and initiatives, is still valuable as it provides opportunities for self examination and improvements. The cardinal argument here is that it is better to release to the public whatever data is available instead of withholding it from public inspection.

Studies conducted by Kucera and Chlapek (2014) from University of Economics, Prague, Czech Republic indicated that there are major benefits to be gained from open data. These benefits are indicated in Table 1.

Table 1: Benefits of Open Data

ID	Benefit	Description
1	Increased transparency	Access to government data enables citizens to see how decisions were made and how the different arms of government are performing in delivering services to the citizens.
2	Improved public relations and attitudes toward government	The release of government data is one key aspect of taking the government to the public and can be used to build a better understanding and relationship between the government and the public in general.
3	Improved reputation of a public sector body	The release of data is likely to result in increased appreciation and acceptance of the government agencies' programmes and activities by the public.
4	Transparent way of informing the general public about infringement of legislation	The release of government data will also enable the citizens to be aware of non-conformance to legislative and regulatory provisions as well as deviations in policy implementation by their governments.
5	Improved government services	The release of government data often leads to improved government services to members of the public. Above all, the release of such data often provides opportunities for the identification of areas of weakness in the delivery of such services and may even lead to changes in operations.
6	Improved government data and processes	If open government data users are allowed to provide feedback about the published datasets, they might notify the curators of these datasets about possible errors in data. This feedback might be utilised to improve the quality of the data provided. Not only businesses and citizens might become open government data re-users, other public sector bodies might also benefit from better discoverability and usability of it. Linked Open Government Data (LOGD) can further improve flexibility of data integration and can reduce integration costs. LOGD allows a public sector body to link to data published and maintained by other public sector bodies without the need to maintain separate copies of that data.

7	Better understanding and management of data within public sector bodies	Cataloguing of open government data and development of lists of published or maintained datasets might help public sector bodies to better understand what data they have and how to better manage this data.
8	Supporting re-use	Machine readability, availability of metadata and legal openness of open government data makes it easier to re-use. Thanks to this, it should also be easier to develop applications utilising open government data and these applications might be developed by private sector entities.
9	Increasing value of the data	New value can stem from the re-use of open government data. Application of linked data principles enables the enrichment of data held by an organisation with linked open data resources available on the Web. Therefore application of the linked data principles to open government data can facilitate an increase of its value because it allows interlinking of separate open government datasets.
10	Stimulating economic growth	The publication of open government data as a resource that can be used by entrepreneurs to develop new or innovative products and services can stimulate economic growth. The public sector might stimulate the use of open government data and as a result it can stimulate innovation and growth as well.
11	Minimising errors when working with government data	The availability of data in machine readable formats minimises the need to manually transcribe data from documents. Since errors might be introduced into manually transcribed copies, the availability of open government data might help to reduce the probability of these errors.
12	Easier translations	The availability of machine readable data helps in situations when, for example, a report is being translated into other languages. This allows graphs, charts, column headers or table cells to be easily translated. It is much more difficult to translate charts or tables that are available only as pictures in the original document.
13	Less requests for data	The publication of open government data can help to reduce the number of requests for data because people and organisations will be able to satisfy their information needs by utilising the published datasets.

Source: Kucera and Chlapek (2014:33)

Obstacles to Open Government Data

Despite the numerous benefits that may be gained in releasing government data, in many countries data is often withheld from public inspection. The reasons for withholding such data are varied and range from inadequate legislative, regulatory and policy frameworks; organisational cultures; inadequate infrastructure; and failure to appreciate the value of releasing such information to the public. Martin (2010), a researcher at the University of Leeds, has chronicled a number of obstacles that must be addressed if the full benefits of open data are to be realised. These obstacles include:

- 1) The culture of secrecy. Many governments believe in withholding information from the public. In several countries civil servants are prohibited from disclosing any information under their care. This is a major obstacle relating to the release of vast quantities of government-held data.
- 2) Opening data is not seen as part of the daily routines of the government. Such disclosure is often viewed as an extra activity to those who are responsible for managing government held information.
- 3) Lack of clear policies and procedures relating to the disclosure of government information. As many governments have failed to enact freedom of information legislation, disclosure of government-held information is often problematic as there are no clear guidelines on the types of information that may be accessed. When national archival legislation is in existence, it imposes closure periods of between 20-30 years with no clear closure periods for records that are subjected to extended closure. Lack of clear policies and procedures to be followed where denial to access government-held information is also a major impediment to gaining access to government held information and data.
- 4) In some instances, custodians of government information and data do not fully appreciate the value of information under their custody or are not convinced that such information is of potential value to those seeking to gain access to it.
- 5) In some other instances there is fear among government officials that the disclosure of information may attract negative criticism, loss of revenue to the state or the data may be used by the private sector to unfairly benefit at the expense of the general public and the government.

- 6) A key obstacle to the release of government information and data is often that the release of such information may lead to invasions into individual privacies as well as gross violations of human rights.
- 7) There is also the fear on the part of governments that the release of information will result into greater demands for the release of other information which for various reasons the governments may not wish to avail to the public.

Clearly the picture that emerges from the above discussion is that the release of data may in some instances result in the intrusion of individual private affairs, loss of revenue by the government, misuse of the data and unauthorised disclosure of sensitive information. In order to address these concerns, there is need for the formulation of privacy and freedom of information laws with clear guidelines on the kinds of data that may be released for public inspection. Such laws normally include exemption clauses justifying the reasons for the withholding of certain documents. It cannot be overstated that such exemptions should not be used to deny citizens access to government data. Moreover, there should be clear procedures for appeals against such denials to information. Exemption of this nature should have time limits which ensure that citizens have the opportunity of accessing such information during their lifetime. There is therefore a need for striking the right balance between the citizen's rights of access to data and information and the rights to privacy on matters of national interest.

Risks Associated With Open Data

While major benefits exist through the provision of open data, there are certainly risks that come along with the opening up of such data. Some of these risks are real and a major hindrance to open government and are often cited by those governments wishing to withhold data from public inspection. Studies conducted by Kucera and Chlapek (2014) from the University of Economics, Prague, Czech Republic indicated that there are risks associated with the release of open data. They further classify the risks as high, medium and low. The Table 2 shows identified risks as well as the level of risks involved.

Table 2: Risks associated with open data

Risk	Description	Severity
Publication of data against the law	Publication of data that violates some legislations, that is, it is prohibited by law or it infringes on someone's rights or freedoms.	High
Trade secret protection infringement	Publication of data that reveals some trade secrets that ought to be protected.	High
Privacy infringement	Publication of personal data that ought to be protected.	High
Risk to security of infrastructure	Detailed data about infrastructure (power plants, dams, transmitters) might be misused to cause damage to the infrastructure.	High
Publication of improper data	Publication of data that does not violate legislation but that might lead to a negative publicity or negative attitude of other public sector bodies.	Medium
Publication of inaccurate data	People and organisations might provide incorrect data to the public sector bodies. As a consequence incorrect open government data might be published if datasets are derived from incorrect primary data.	Medium
Misinterpretation of the data	Published data can be interpreted in different ways. Users might intentionally or unintentionally misinterpret the data (to cause scandal, to get competitive advantage, to cause harm to other subjects).	Medium
Absence of data consumers	There will be no consumers of the data because it will not be possible to locate the dataset or because nobody will find it interesting.	Medium
Subjects less willing to cooperate	Published data about the results of the administrative supervision might bring negative publicity to those who do not comply with the legislation. These subjects might be then less willing to cooperate with the public sector bodies.	Low
Overlapping of data	Datasets might contain overlapping collections of data. More datasets on various websites might contain data on the same topic. If these datasets are inconsistent users might get confused.	Low
Increased number of requests for data	Increased number of published datasets might lead to an increased number of requests or questions about the published data or some related data.	Low

Source: Kucera and Chlapek (2014:35)

As can be seen from Table 2, there are many risks surrounding the release of open government data. However, it cannot be overstated that the benefits of releasing open data outweigh the risks of releasing such data.

Open Government Data Initiatives in Africa

On the eve of independence, most African nations inherited from their colonial masters a culture of secrecy. Legislative frameworks, policies and procedures that promoted a culture of secrets were built into government structures. Restrictions on access to information were the norm rather than the exception. Archival legislation that was introduced imposed closure periods of between 30 and 50 years with extended closure periods for records deemed to contain sensitive information. With restricted access to government-held records, it was virtually impossible to hold governments to account. This resulted in human rights violations and lack of transparency. As demands for transparency and accountability increased, governments began to respond by enacting freedom of information legislation and privacy laws. Today, several African countries have enacted freedom of information laws while others are in the process of drafting such laws. It must, however, be stated that the enactment of freedom of information laws does not necessarily suggest that access to government-held information in these countries is automatic. Hindrances in implementing rights of access to government-held data and information have been reported in many African countries where freedom of information laws are in place. The section that follows describes some of the efforts made by African governments in developing initiatives aimed at enhancing access to government held data.

Within Africa, the open government data initiative has witnessed a steady growth over the last few years. A survey conducted by Africa: Tracking Internet Progress (2014) indicates that open government data movement has gained significant momentum in Africa in the last two years starting in Morocco, South Africa and Kenya and more recently in Ghana, Liberia, Sierra Leone, Uganda, South Sudan and Zambia. Africa Tracking Internet Progress (2013) indicates that in Africa open government data is starting to make an impact but African initiatives are scarce. A global survey of 77 countries using the the Open Data Barometer (2015) which measures the context, availability and emerging impacts of open government revealed that in Africa 21 countries were at varying stages in the implementation of open government initiatives. These countries include Benin, Botswana, Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Malawi, Mali, Mauritius, Morocco, Namibia, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Tunisia, Uganda, Zambia, and Zimbabwe. Specifically, the findings showed that:

- 1) Morocco was the first African nation to launch an open government data initiative (in March 2011). Kenya launched one in July 2011.
- 2) A survey of Kenyan citizens found high demand for government data but only 14% were aware of the national open data portal.
- 3) Morocco's open data portal focuses on financial data but has not promoted the portal extensively.
- 4) Ghana launched a beta open government data initiative in 2012. More than 100 datasets are publicly available.
- 5) African data was often provided through national statistical services.
- 6) Budgets, though often published, are not quite fully open.
- 7) Challenges facing open government data are a lack of digital data collection and poor management of existing data.
- 8) No African country was found linking to the African Development Bank open data for Africa platform.
- 9) Kenya is the leading developing country; it leads developed countries such as Ireland and Belgium.
- 10) Nigeria's Edo State is an exception where a regional open government data initiative was launched before a national one.
- 11) Citizens and civil society are relatively more ready than government or entrepreneurs to embrace open government data principles.
- 12) Low readiness for open data is due to limited Internet access and a lack of ICT training.

With regard to the ranking, the findings showed that:

- 1) Kenya (22nd) ranks highly for openness of government budget, government spending, public transport timetables, and crime statistics.
 - 2) Morocco (40th) has a good level of openness of government budget and government spending.
 - 3) Mauritius (42nd) has a moderate level of openness of government budget, international trade, education, crime statistics, environment statistics, and election results.
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- 4) Rwanda (45th) has a good level of openness of international trade, health, education, and environment statistics.
- 5) Ghana (47th) has a moderate level of openness of census, government budget, and education.
- 6) South Africa (52nd) has a good level of openness of public transport timetables and election results.
- 7) Uganda (55th) has a good level of openness of international trade.
- 8) Botswana (55th) has a good level of openness of government spending and environment statistics.
- 9) Tanzania (58th) has a good level of openness of maps and a moderate openness of education.
- 10) Malawi (59th) has a moderate level of openness of census.
- 11) Ethiopia (66th) has a moderate level of openness of government budget.
- 12) Benin (67th) has a moderate level of openness of company registration.
- 13) Namibia (67th) has a moderate level of openness of international trade.
- 14) In Nigeria, readiness for open data is high but the level of implementation is extremely low (non-existent).
- 15) Burkina Faso, Cameroon, Zimbabwe, Zambia, Senegal, Mali and Nigeria all have extremely low or no openness of any of the 14 sub-categories.
- 16) Within Africa, Tunisia ranks highest for open government data readiness, followed by Kenya and Ghana.
- 17) Within Africa, Kenya leads by far in terms of open government data implementation, followed by Morocco, Mauritius and Rwanda.
- 18) Within Africa, Tunisia has seen the strongest impact from open data - slightly edging out Kenya and Uganda.

While the above findings provide an indication of the steady progress being made by African countries, the open data barometer is of the view that there are no real champions in the African continent and more work still needs to be done if Africa is to become engaged with open data initiatives.

Based on the above findings, it is evident that although African countries have embraced open government data initiatives, much still needs to be done in marketing and educating the citizens on ways of accessing the open government data. There is also a need to improve ICT infrastructure so that more citizens can benefit from this initiative. Further, there is need for African governments to place more datasets such as government reports and other research outputs from publicly funded activities in the government portals.

Conclusion

The formulation of freedom of information legislation has had a major impact on the citizen rights to access information. While many governments in Africa are yet to implement open government data initiatives, there is a growing realisation that governments can no longer continue to ignore the citizen rights to access government held data. Perhaps the greatest fear to open data government has to do with the need to protect national interests and personal data contained in the collected information. The need to protect national interests such as security concerns, diplomatic/foreign relations, trade secrets and information that might have been supplied in confidence is justified and acknowledged in all civilised societies. The same applies to the protection of personal data. In order to address such concerns, it is recommended that countries operating open data initiatives should put in place privacy laws as well as pass freedom of information legislation. Freedom of information legislation makes provision for exemptions in which certain types of information is withheld from public inspection for specified periods of time. The underlying principle is that nothing should be restricted indefinitely. This is a view that is supported by the International Council on Archives Principles on Access (2012) in which it is clearly stated that institutions holding archives should ensure that restrictions on access are clear and of a stated duration; are based on pertinent legislation; acknowledge the right of privacy; and respect the rights of owners of private materials.

The World Bank (2000) suggested that successful implementation of open government initiatives demands extensive use of ICTs and requires national governments to adequately address the following factors:

- 1) appropriate provision in legislation both for the management of electronic transactions and for legal admissibility;
- 2) adequate management structures and assignment of responsibilities;
- 3) well-organised, accurate and easily accessible source data;

- 4) appropriate systems design, including provision for capture of contextual data and realistic targets;
- 5) clearly defined backup and storage procedures;
- 6) appropriate system documentation; and
- 7) an appropriate environmental conditions and physical security sufficient budget allocations to cover all costs.

As indicated above, failure by governments in Africa to sufficiently address these issues has resulted in that continent's inability to enjoy the maximum benefits that accompany the application of ICTs in government data management. Unless these problems are adequately addressed, there is no way that open government data initiatives will succeed. African governments must put policies and procedures in place that will increase citizen rights of access to the vast quantities of public data held by the governments which in the first instance was funded through public resources. The need for harmonisation of efforts between open data initiatives, the enactment of freedom of information laws, as well as privacy laws is needed if the continent is to reap the full benefits of open data initiatives. Above all, records managers, archivists and other information professionals must be involved in the collection, organisation, storage and retrieval of government held data and ensure that sufficient metadata is captured failure to which access to government data is bound to be problematic. No longer should records managers allow themselves to be sidelined by information technology experts; they must rise to the challenge by acquiring new skills and working in partnership with ICT personnel.

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The Impact of Information Management Practices on the performance of County Governments in Central Kenya: A Case of Nyeri County

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Abstract

Information management is critical in influencing an organisation's ability to sustain a long-term competitive advantage. This chapter, resulting from a research study, examines the impact of information management practices on the performance of county governments in Central Kenya using the Nyeri County government as a case study. The study specifically sought to determine the information management practices used by the Nyeri County government; and establish the effectiveness of these information management practices in supporting government activities. The study was designed as a survey and targeted 82 management and administrative county staff in the six sub-county offices of Nyeri County (in Tetu, Kieni, Mathira, Othaya, Mukurweini, and Nyeri Town) and the Nyeri County governor. The study adopted census sampling design due to the small number of the potential respondents and also because this method was bound to enhance the reliability of the findings. The choice of a census design maximised the confidence level while at the same time greatly reduced the margin of error. Questionnaires and interview schedules were used as the main data collection instruments. The study found out that effective use of information management practices has enabled the Nyeri County government to be more responsive and consistent in service delivery as well and projected an image of good faith in a bid to audit and improve governance. These practices were effective mainly because they improved service delivery in the county office, and maintained convenient, secure and efficient storage and retrieval of county government information in the county government offices. The findings of this study may be used by the governors as the base upon which to review the county accountability and transparency principles and practices.

Keywords: *Information management, strategies, practices, performance, County Government of Nyeri, Kenya*

Introduction

Sharma (2010) defines information management as the application of management procedures to gather information, communicate it within and outside an establishment, and refine it to allow managers to make faster and improved decisions. All over the world there is an increasing determination to utilise effective information management approaches to enhance good governance. The concept of good governance has recently been associated with many organisations such as private corporations, nongovernmental organisations, and of course, government agencies (O'Neill, 2009). In public administration good governance is regarded as being part of the new paradigms. Part of it is in the public administration of the new governance paradigms which emphasise the responsibility of government towards its citizens in terms of controlling the quality of service to citizens in accordance with the superior service delivery, transparency and accountability (Okot-Uma, 2001). As they endeavour to accomplish great administration, governments have swung to new and rising technology and are seeking to bridle the potential offered by these innovations to change government, democracy, government-related exchanges and additionally all the social and financial societal elements (Okot-Uma, 2001).

Across Europe, governments progressively perceive the fact that data is a critical part of good administration (Hendriks, 2012). As governments endeavour to enhance administration conveyance, use assets proficiently, react to residents' needs and be open about basic leadership procedures and systems, they have understood the need to oversee and use data viably. In Africa, Boisdeffre (2006) asserts that governments and their departments have found it hard to give an exact, complete, and straightforward record of their budgetary position to parliaments or to other concerned individuals, including funders and the overall population. This absence of data has thwarted straightforwardness and the implementation of responsibility in government, and has added to the apparent administration issues.

Consequently, many African countries have been obliged to push for adoption of effective information management practices.

In Kenya, effective information management has been largely implemented by the central government; not the 47 county governments. According to King'ori and Otike (2010), it has been greatly feared that corruption, among other vices such as general misappropriation of public funds are not only bound to be devolved to but are also likely to be multiplied at county levels. One of the most effective ways of sealing any potential loopholes through

which crucial information could be lost is to ensure that all the county governments have and apply effective information management practices. Consequently, this chapter examines the impact of information management practices by county governments in Kenya with specific reference to Nyeri County government. Nyeri County government comprises the following departments: administration, corporate services and stakeholders management, land, housing physical planning and urban development, energy, water, environment and natural resources, roads, public works and transport, cultural, sports, youth and social services, education, labour and manpower development, agriculture, livestock, cooperative development, trade and industry, finance and economic planning and health services. These departments provided information pertinent to the study.

Information Management and Service Delivery

There is a connection between enhanced public service delivery and effective information management. Information management is a crucial component of the reform agenda of any public sector; the efficiency of which entails enhancing the public service efficacy and effectiveness (Kemoni, 2008). In Kenya, information management has remained a neglected function in most administration units especially in public institutions. This is potentially hazardous to newly formed county governments. There is therefore a need to identify how the use of effective information management practices can impact county government operations and enhance public service delivery and build trust and confidence of the members of public that they serve. The study therefore focused on the concept of information management within the context of governance with the aim of creating a resonance between information management practices and the effectiveness of county governments. The specific objectives of this study were to determine the information management practices in the Nyeri County government as well as establish the effectiveness of the same in enhancing the performance of the county government.

Organisational Information Theory

This chapter is based on the Organisational Information Theory (OIT). This is a communication theory that offers strategic insight into the distinctive ways information is distributed and utilised in organisations. The theory was developed by Karl Weick in 1976. Its central principles are anchored on the belief that organisations are process, rather than, structurally driven (Weick, 1976). OIT stresses on decreasing levels of communication equivocality or

ambiguity which typically exists in vibrant environments that are information-rich. With an interdisciplinary framework, organisational information is applied in institutional frameworks to eradicate both uncertainty and intricacy from messaging in the workplace (Daniels & Spiker, 2008). It is also used to build upon previous findings from overall systems philosophies and theory. Critics of the theory affirm that OIT does not significantly deal with conflict or hierarchy which are the two major elements related to organisational communications (Taylor & Every, 2000). On the whole, by allowing the study to contemplate the organisation in this alternate framework, the theory provided the authors with a strong basis from which to examine the information management practices and their effectiveness in supporting good governance and performance by county governments.

Review of Literature

Governments, just like all other establishments, need to keep information about their decisions and dealings so as to meet the demands for accountability and to satisfy their own information requirements. According to Budhiraja (2005), as governments progressively lead their everyday work through ICT applications, records emanating from such exchanges should be handled, overseen and safeguarded in a composed framework, which keeps up their uprightness and validity.

Information management systems have fundamentally altered the nature of public administration, to the extent that they now underpin the basic functioning of most public programmes and contribute to the most significant innovations in the delivery of public-sector services (Dada, 2006; Holden, 2003). Examples of such services include filing of tax, identity management, government jobs application, obtaining/renewal of certificates and licenses, registering to vote, and in some cases votes casting (Baqir & Iyer, 2010). Gichoya (2005) and O'Neill (2009) contend that with the development of information management practices, and e-Government, it is feasible to enhance proficiency and viability of inside organisation inside government and to re-find taxpayer supported organisation from government workplaces to areas nearer to the subjects. These locations may be cyber cafés, telecentres or personal computers in the office or at home.

County governments in Kenya perceive information management systems as important tools for conveying services to residents and businesses. There are a number of electronic governance systems. These systems mostly focus on collecting revenue grounded on Local Authorities Integrated Financial and

Operations Management System (LAIFO MS). LAIFO MS was used by the local authorities before the establishment of county governments (Mokaya & Njuguna, 2013). The ICT Authority is a government agency under the Ministry of Information Communication and Technology (MoICT) created in August 2013 to moderate governance information management. The role of the ICT Authority in county governments is to support counties to attain self-sufficiency in their processes and service to citizens through effective information management. Effective information management assists county governments to promote information management approaches for faster development and equal services to citizens. These include the establishment of communal and collective infrastructure such as data-centres and agencies that offer every government service to citizens; business expansion which includes creation of jobs, entrepreneurship and innovation; and providing better services to citizens (ICT Authority of Kenya, 2014).

Methodology

This study employed a survey research design. This is a design characterised by organised data collection from members of a specified population. This design also follows processes such as identifying a target population, development of data collection tools, selection of an appropriate sample, administration of data collection instruments as well as descriptively analysing and presenting data through tables, frequencies, percentages and means (Gall, 2004). The survey research design was selected because it was deemed ideal for assessing the current status of information management practices and their impact on the performance of the county governments. In this study, the target population were all the 82 management and administrative county staff in the six sub-county offices of Nyeri County located in Tetu, Kieni, Mathira, Othaya, Mukurweini, and Nyeri Town and the Nyeri County governor. The researchers used a census sampling approach whereby all the staff were invited to participate in the study as respondents. The census sampling approach was used due to the small number of the potential respondents and also because this method was bound to enrich the findings. Another advantage of the census method is that it maximises the confidence level while also reducing the margin of error (Barton, 2001). Thus, the respondents of the study were all the 15 (12 management; 3 administrative) staff members based at the Tetu sub-county; 11 (9 management; 2 administrative) from Kieni; 14 (11 management; 3 administrative) from Mathira; 11 (9 management; 2 administrative) from Othaya; 15 (11 management; 4 administrative) Mukurweini; and 16 (11 management; 5 administrative) from Nyeri Town.

A summary of the distribution of the respondents is presented in Table 1. A structured questionnaire was used to collect data from all the county government staff in their respective stations. An interview guide was used to collect data from the governor.

Table 1: Summary of respondents according to duty station and job cadre

Station	Management	Administration	Total
Tetu	12	3	15
Kieni	9	2	11
Mathira	11	3	14
Othaya	9	2	11
Mukurweini	11	4	15
Nyeri Town	11	5	16
Total	63	19	82

The data collected was coded using SPSS version 22 for Windows and analysed using descriptive statistics. The results of the quantitative data from the coded closed-ended questions in the questionnaires were presented using tables, frequencies and percentages. Additionally, the data was interpreted in line with the research objectives. On the other hand, the qualitative data obtained from open-ended questions in the interview guide was analysed and categorised in themes in accordance with the research objectives and was reported in prose.

Findings and Discussions

This section presents and discusses the findings of the study.

Response rate

The researchers distributed 82 questionnaires to the county staff. Out of these, 79 were received back. This represents a 96.3% response rate. According to Owens (2002), a response rate of over 70% is deemed to be representative. The high turnout was achieved because the researchers administered the questionnaires in the offices of the respondents. The Nyeri County governor and his deputy were unavailable for the interview. Instead, the governor mandated the County Director of Communication to be interviewed in his place. The researchers shared the interview guide with the County Director of Communication for consultation with the governor before the interview. This was in an effort to ensure that his responses represented the views of the governor.

Background information of the respondents

The researchers considered the background information of the management and administrative county staff who took part in the study. A majority of the participants in the study, 44 (55.7%), were female while 35 (44.3 %) were male. Regarding the age of the participating staff members, the majority of them, 41 (51.9%), were between 31 years and 40 years, 24 (48.9) were between 41 years and 50 years, 9 (11.4%) were between 20 years and 30 years, while 5 (10.2%) were aged 50 years and above. Pertaining to working experience, the close majority, 42 (53.3%), had an experience of 5 years and above, 25 (51.1%) had an experience of 1 to 2 years, while 12 (24.5%) had an experience of 3 to 4 years. These findings show that the majority of the staff members were relatively mature and sufficiently experienced in their field of occupation. As such, they were in touch with the previous and current trends in information management, meaning they were able to provide accurate and reliable data on the impact of information management practices used by the Nyeri County government. The findings also demonstrate that the majority of county staff are female. This may be attributed to the fact that most of the male population work in the major cities away from Nyeri. It was also observed that although there were more female than male employees in Nyeri County, the male members of staff dominated the senior positions. This is a replication of the general trends in Kenya and other developing countries where ladies are either jobless or employed in low cadre positions.

Information management practices in the Nyeri County Government

The study sought to determine the information management practices in the Nyeri County government. To capture this objective, the participating staff members were first asked to indicate whether there were particular information management procedures in their offices. All the 79 respondents (100%) indicated that there were specific information management procedures in the offices. The participating staff members were further asked to indicate these particular procedures. Their responses are shown in Table 2.

Table 2: Staff members' response on information management practices in the county government offices

Practices	Frequency	%
a) Financial information management	72	91.1
b) Dissemination of government reports to citizens	70	88.6
c) Internal administration data organisation	65	82.3
d) Classification of application documentation	65	82.3
e) Filing of vacancies and tenders	53	67.1

These findings reveal that a great majority (91.1%) of the staff members who participated in the study indicated that there are procedures governing financial information management. The other identified practices include dissemination of government reports to citizens (88.6%); internal administration data organisation (82.3%); classification of application documentation (82.3%); and filing of vacancies and tenders (53, 67.1%). The county director of communication explained that the information management practices in the county government were designed to ensure the effective archival of vital information for business continuity; governance data recovery; timely and efficient provision of information; organisation and accountability of records; as well as training and communication on key directives.

These findings imply that information management practices in the county government are geared towards responsiveness and consistency of government activities and interventions. They also indicate that the government uses information management practices to project an image of good faith in a bid to audit and improve governance. The findings are in concurrence with the assertion by Hendriks (2012) that an organisation with a solid foundation of proven successful records management practices, for instance, will control and manage records effectively and promptly and demonstrate proven practices of integrity through consistent implementation. Thus the presence and implementation of effective information management practices enhance transparency and corporate image. Therefore, the researchers conclude that effective information management practices in public institutions like county governments contribute to better service delivery, transparency and public perception.

Effectiveness of information management practices in the Nyeri County Government

The study was also interested in determining the effectiveness of information management practices in the Nyeri County government. Staff members participating in the study were first asked to indicate whether information management procedures in their offices were effective or not. All the 79 respondents (100%) indicated that information management procedures in their offices were effective. This consensus in positively assessing the effectiveness of information management practices is perhaps attributed to fact that most staff in the public sector organisations and governments operate under a *de facto* official secrets policy requiring them not to project their employer negatively. Nonetheless, this finding could also be an outcome of the recent growing acceptance of information as a critical resource in organisations and the efforts which have been made to enhance its management. It may have also been a result of the application of the recently enacted right of access to information laws in Kenya which require public and private institutions to organise information in their custody in ways which enhance its access and use. Furthermore, the fact that the functions of the county government are devolved to the sub-county levels also implies that the information generated or collected at this level is easier to manage.

The participating staff members were then provided with a number of information management practices and asked to indicate the extent to which they were effective in their offices. Table 3 shows their responses.

Table 3: Effectiveness of information management practices in the County Government

Practices	To a greater extent		To some extent		Not at all	
	F	%	F	%	F	%
a) Information management practices facilitate the county government’s delivery of universal service to citizens	46	58.2	26	32.9	7	8.9
b) Information management procedures assist the county government to achieve autonomy in their operations	39	49.4	28	35.4	12	15.2
c) Information management practices guarantee convenient county government services to the citizens	34	43.0	19	24.1	26	32.9
d) Information management procedures nurture business development in the county government through job creation and innovation	32	40.5	31	39.2	16	20.3
e) Information management procedures foster accelerated achievement of the county government’s development agenda	23	29.1	13	16.5	43	54.4

Table 3 shows the participating staff members’ response on the extent to which information management procedures were effective in their office. Concerning whether information management practices facilitate the county government’s delivery of universal service to citizens, a majority 46 (58.2%) of the staff members indicated that they facilitated to a greater extent; 26 (32.9%) pointed out that they did to some extent whereas 7 (8.9%) were of the view that it they did not facilitate at all. This implies that a whopping 91.1% of the respondents were of the view that the information management practices embraced by the county staff facilitate the government to deliver universal services to the citizens. These findings underscore the role of information in articulating and delivering public services. Effective information flow and exchange in or between government institutions enhance the demand and supply of services to the public.

Pertaining to the view that the information management procedures assist the county government to achieve autonomy in their operations, 39 (49.4%) of the staff members observed that they did, to a greater extent; 28 (35.4%) were of the view that they did, to some extent whereas 12 (15.2%) indicated

that that they did not assist at all. This implies that a large majority (84.8%) of the staff acknowledges that their distinctness as a county government is based on the information they generate, collect and use. These findings also underscore the prominent role which effective information management plays in ensuring better service delivery to the public. There is no better way to demonstrate the autonomy of the county government than the services it offers to its citizens.

With respect to whether information management practices guarantee convenient county government services to the citizens, 34 (43%) of the staff members were of the opinion that they did to a greater extent; 19 (24.1%) pointed out that they did, to some extent whilst 26 (32.9%) observed that they did not guarantee at all. It is noteworthy that although the majority (67.1%) believe that information management practices guarantee convenient county government services to the citizens, there is a sizable (32.9%) minority which is of a contrary view. This response could be attributed to the fact that most of information services are generally obtained by the public from the county government offices thus limiting the level of convenience the public experiences with government services. It is also important to point out that even where there are electronic services which can be accessed remotely, a large majority of the public still lacks the skills or tools to make the best use of these facilities and therefore continues to rely on physical services. The situation is expected to improve gradually with the advancements in the information sector in Kenya.

Regarding the perspective that information management procedures nurture business development in the county government through job creation and innovation, 32 (40%) pointed out that they did to a greater extent; 31 (39.2%) observed that they did to some extent whereas 16 (20.3%) indicated they did not nurture at all. It is evident from the findings that 79.2% agree that information management procedures nurture business development in the county government through job creation and innovation. This is significant because most county governments operate as welfare units to which citizens come for handouts. Counties will develop better if the citizens are empowered through effective information management practices to develop business ideas and innovations. Thriving and innovative businesses will result in jobs and the resultant economic development in the county. These findings underscore the crucial role information plays in socioeconomic development. Therefore, the authors submit that the extent to which county governments attain their development goals will be determined by the effectiveness of their information management practices.

On whether information management procedures foster accelerated achievement of the county government's development agenda, 23 (29.1%) were of the opinion that they did to a greater extent; 23 (16.5%) observed that they did to some extent whereas 43 (54.4%) were of the opinion that they did not foster it at all. Here, the majority (54.4%) hold the view that information management practices do not foster accelerated achievement of the county government's development agenda. This implies that there is need to improve the information management practices and link them closely to the county's development agenda.

The county director of communication explained that information management practices 1) ensure that risks to county government information are minimised; 2) guarantee that county government data is managed appropriately; 3) enable careful handling of county information to prevent damage and deterioration; and 4) ensure that county government information is identified, located and retrieved easily. The findings indicate that effective information management practices improve service delivery in the county office as well as maintain convenient, secure and efficient storage and retrieval of county government information. These findings concur with Baqir and Iyer (2010) who observed that affordable, secure capacity frameworks that give fast and quick recovery of information will guarantee the accessibility of data in case of disasters and additionally for future reference particularly when delivering service to the general public.

Conclusion

The study reveals that county governments in Central Kenya have developed guidelines and systems for financial information management; dissemination of government reports to citizens; internal administrative data organisation; as well as classification and filing of application and tender documents. These findings imply that information management practices in the county government are geared towards responsiveness and consistency of government activities and interventions. All the respondents also concurred that information management practices in their offices were effective. The findings also indicate that the information management practices facilitate the county government's delivery of universal service to citizens; information management practices assist the county government to achieve autonomy in their operations; information management practices guarantees convenient county government services to the citizens; and information management practices nurture business development in the county government through

job creation and innovation. However, the information management practices do not currently foster accelerated achievement of the county government's development agenda. Therefore, there is need to improve the information management practices to link them closely to the county's development agenda.

Recommendations

From the foregoing, the authors make the following recommendations:

1. The county government should closely link the information management practices to its development strategy and agenda. This close linkage will ensure that the information management practices foster an accelerated realisation of the development agenda. This recommendation should be implemented by the governor and the director of communication immediately.
2. The county government should develop an information management strategy. Although there are several guidelines and established procedures which govern information management in the county, these may not be effective without a documented strategy which directs them to contribute to specific strategic outcomes. The governor and director of communication should implement this recommendation immediately.
3. The county government should develop and implement information management practices which facilitate convenient access to information and services by the public. This can be achieved through digitisation of information products and digitalisation of information management processes. The county director of communication can implement this in collaboration with the ICT division.
4. The county government should maintain the existing guidelines and practices on information management. However, these should be updated to reflect the emerging tools, technologies, techniques and trends. This will ensure that these practices continue to serve the existing and emerging stakeholder information needs and wants. The county director of communication can implement this in collaboration with the ICT division.
5. The county government should also continuously build the capacity of its staff to competently oversee the implementation of the information management practices so as to enhance their effectiveness.

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Knowledge Management Strategy for Effective Implementation of the 2030 Sustainable Development Goals in Africa

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Abstract

Despite some progress having been registered in the past decades, Africa is still struggling with the development imperative as the world moves towards implementation of the 2030 agenda for Sustainable Development Goals (SDGs) adopted by the United Nations in late 2015. In this context, African countries are called upon to design and implement innovative policies and undertake pragmatic actions to achieve sustainable development. The importance of information and knowledge for development and the need to create knowledge societies which can effectively engage in development is essential because development is about people and the planet. Using secondary sources of data obtained from a research study, this chapter adopts an analytical approach to comprehensively examine the processes undertaken in pursuit of sustainable development through the implementation of the millennium development goals over the past fifteen years. Specifically, the analyses are focused on the social, economic and environment factors which are core to sustainability. On the basis of experiences in these processes, the chapter identifies key challenges including knowledge gaps as well as weaknesses in linking knowledge to actions. Lessons learnt from these experiences inform the direction that African countries need to take in the next 15 years as they embark on the implementing the 2030 development agenda. The chapter pins its analysis within the conceptual framework that calls for knowledge management strategies to bridge gaps that exist between knowledge and actions in the context of ownership, participation, knowledge creation process, integration, communication and political judgments. After exploring various knowledge management strategies in different contexts, the chapter identifies components of a knowledge management strategy which will enhance Africa's success in the implementation of the 2030 sustainable development goals. It concludes that as countries embark on a 15-year journey towards sustainable development, it is important that plans and processes adopt an effective knowledge management strategy to enhance the impact of interventions and levels of success.

Keywords: *Knowledge management strategies, sustainable development, SDGs, Africa*

Introduction

In September 2015, the United Nations adopted the 2030 Sustainable Development Goals (SDGs) to guide development imperative of countries over the next fifteen years. The 2030 Sustainable Development Goals enumerate 17 goals, 169 targets and 230 indicators. The 2030 SDGs precede the Millennium Development Goals endorsed by the United Nations at the turn of the century in 2000. The MDGs were regarded as a commitment by the international community to pool their resources together to ensure a safer, prosperous and equitable world. The MDGs pledged to eradicate extreme poverty; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/Aids, malaria and other diseases; ensure environmental sustainability; and develop a global partnership for development (UN Summit, 2010:1). In essence, for Africa the MDGs reflected a response to decades of struggle for development demonstrated by a vicious circle of experimental programmes, at most designed by international financial institutions, ranging from structural adjustment programmes, poverty alleviation strategies and liberalisation or market economy policies, all of which failed miserably to bring desired results. According to recent reports, among the 48 poorest countries in the world, 34 are in Africa (UNESCO, 2015).

As the world moves towards the implementation of the 2030 agenda for sustainable development adopted by the United Nations in late 2015, Africa is still struggling with its development imperative. In this context, African countries are called upon to design and implement innovative policies and undertake pragmatic actions to achieve sustainable development.

It is in the above context that this chapter adopts an analytical approach to examine in a comprehensive manner processes in the pursuit of sustainable development through implementation of the MDGs over the past fifteen years. On the basis of experiences in these processes, the author seeks to identify key challenges including knowledge gaps holding back the effective implementation of these development blueprints. Lessons learnt from these experiences inform the direction that African countries need to take in the next 15 years as they embark on implementing the 2030 agenda. The central thesis of this article is that it is crucial for Africa to adopt an effective knowledge management strategy that links knowledge to actions within a relevant conceptual framework.

Conceptual Framework

Knowledge management involves knowledge creation, organisation and application. There are several conceptual frameworks that have been developed by scholars to put into context the various elements and processes involved in managing knowledge. Mansour *et al.* (2011) undertook a thorough analysis of conceptual frameworks for knowledge management processes. They developed a taxonomy of knowledge management processes which identified 16 dimensions of processes which range from four to seven depending on type, purpose, platform as well as other variables. On the other hand Pi-Sheng and Wright (2001) developed a framework to provide for developing effective knowledge management systems. In their analysis, they laid their premise on the “who”, “why” “what” and “how”. In this context, the framework focused on people, the motivation for knowledge management, needs or knowledge requirements with emphasis on sharing and continuous learning. This multiplicity of knowledge management frameworks shows that knowledge management frameworks are complex and diverse.

The analysis is within the conceptual framework that call for knowledge management processes that bridge gaps that exist between knowledge and actions in the context of ownership, participation, knowledge creation process, integration, communication, and political judgment which are increasingly being advocated by proponents of new approaches to development interventions (Satterswaite, 2003). This framework calls for a thorough analysis of the situation to gather baseline information as well as needs and priorities of beneficiaries while taking cognisance of indigenous knowledge creation processes which exist. Elements of the framework include creating awareness through effective communication channels to ensure participation of beneficiaries in the identification of processes and activities to ensure ownership and linking knowledge to actions. In this regard, the who, what, why and how premise developed by Pi-Sheng and Wright (2001) apply.

The Implementation of Millennium Development Goals in Africa: Processes and Outcomes

African countries, like many other countries, committed themselves to take deliberate initiatives and strategies to implement the MDGs in their countries with the support of the international community through various programmes targeted to address challenges in sectors identified in the MDGs such as education and health. This section examines processes and the various approaches undertaken in some selected African countries to implement

the MDGs. In this examination, various research reports, articles, position papers, and UN reports were used to gather relevant information in order to understand the dynamics involved in the implementation of the MDGs in Africa.

In this examination it was noted that, to some extent, the adoption of the MDGs coincided with the adoption of development blueprints in most of African countries which elaborate strategic visions to achieve social economic development in the next two to three decades. For instance, Tanzania adopted Vision 2025, Kenya Vision 2030, and Zambia 2030. These were followed by elaboration of national development plans and poverty alleviation strategies. Most African countries integrated these MDGs in their strategic documents and long term development plans using existing or adopting new structures to monitor implementation (Afrodad, 2005; Igbuzor, 2011; Commonwealth Foundation, 2013; UNECA, 2015).

In Nigeria, the MDGs were integrated in national development plans and special office (Office of Senior Special Assistant (OSSA) in the President's Office was given the mandate of coordinating the implementation of the MDGs using funds from debt relief across the Ministries, Departments and Agencies (MDAs) conditional grants schemes, monitoring and evaluation of public funds released to support implementation processes (Igbuzor, 2011). On the other hand in Liberia, as the country was emerging from a civil war, the entire implementation process was basically donor driven with limited understanding on both the part of the authorities as well as the beneficiaries. In this context, interventions were designed by UN agencies; basically the entire implementation process was virtually led by the UN country team (Sarwar, 2015).

Like other African countries, Kenya integrated the MDGs in its strategic documents; Poverty Reduction Strategy Paper (PSRP, 2001), Economic Recovery Strategy for Wealth and Employment (2003-7) and later on to Vision 2030 and its resultant medium term plans. MDGs were mainstreamed in development processes of ministries, departments and agencies and the government mobilised other stakeholders in the countries to participate effectively under the guidance of the national focal point in the Ministry of Devolution and Planning (Kenya, MDG Status Report, 2013). With the effective mobilisation and focus to beneficiaries, Kenya took a slightly different approach in the implementation of the MDG goals. The implementation process was undertaken in stages which were not necessarily mutually exclusive; the first stage was used for advocacy sensitisation and awareness

campaigns in order to bring all stakeholders on board. This was followed by a series of activities which included implementation, mainstreaming, localisation, acceleration, fast tracking and intensification (Kenya, Ministry of Devolution and Planning, 2014). This approach also involved the identification of key project activities for each of the goals and involving beneficiaries in the implementation processes. This was a sharp departure from what was happening in other countries. However, despite the efforts to ensure participation and ownership at the local levels, several challenges were identified in the processes.

In Tanzania, the MDGs were integrated into various national policy documents which include the Tanzania Assistance Strategy (TAS), the National Poverty Eradication Strategy (NPES) and Poverty Reduction Strategy Paper (PSRP) all of which reflect the Vision 2025 document (Afrodad, 2005).

In Tanzania implementation was mainly through central and local government structures with limited participation of other key stakeholders. Implementation of MDGs is a concerted effort which requires the effective participation of key stakeholders such as local communities, civil society organisations and the private sector. A critical appraisal of MDG implementation in Tanzania indicated that “at present a few people outside the government and donors know anything about the MDGs. Thus, social commitment and popular participation by the Tanzanian people has therefore been lacking” (Afrodad, 2005:22). In the same vein, a review of MDGs’ implementation in 2013 argues that Tanzania intertwined itself in undertaking processes which adopted a global development framework which at most was top down without a due consideration to the key sustainability elements; the environment, the economy and the social. Key stakeholders in the process such as the civil society and the beneficiaries were left out of the processes with limited information flow and lack of awareness (Commonwealth Foundation, 2013).

Implementation processes in Zambia involved formulation of an MDG framework to guide development and governance processes. Zambia developed its 2030 development vision and its national development plans in 2006 and 2010 which integrated the MDGs and defined goals which sought to address challenges in key sectors of education, health and environment as defined in the MDGs. Zambia adopted a decentralisation drive directed at more participation of citizenry at local levels. However, this was hampered by low levels of capacity and participation (Commonwealth Foundation, Zambia Status Report, 2013). In addition, it has been argued that the approach was not demand driven as the beneficiaries lacked awareness. Efforts to

further integrate MDGs in national and community plans and processes are desirable to enhance levels of success (Commonwealth Foundation, Zambia Status Report, 2013).

Outcomes of MDGs Implementation in Africa

Review undertaken in different countries to assess the achievement made in the eight MDGs paint a gloomy picture. A 2013 review in Tanzania indicated that despite the interventions and the investments directed at implementing the MDGs, there have been little impact on poverty reduction and it was almost impossible to achieve five out of the eight MDGs (Commonwealth Foundation, Tanzania Report, 2013). This situation is not limited to Tanzania alone as reviews undertaken in most other African countries such as Nigeria, Kenya, Ethiopia, Liberia, South Africa, and Zambia depict similar results (Commonwealth Foundation, 2013; Igbuzor, 2011; UNECA, 2015)

For instance, in its review, the United Nations Economic Commission (2015) notes that Africa has made progress in only three out of the eight millennium development goals, and these are universal education; women empowerment; and combating HIV/AIDS, malaria and tuberculosis.

In a review of progress towards the millennium development goals in several Commonwealth countries, it was revealed that current development frameworks and approaches used to guide the implementation processes were flawed and hence could not contribute to the achievement of the MDGs. It is argued that the current global development framework is top down and as a result is not relevant to national contexts (Satterswaite, 2003; Igbuzor, 2011; Commonwealth Foundation, 2013). This assertion has been confirmed by the examination of approaches and processes undertaken in this paper. It is evident that there is a gap between those responsible for coordinating the implementation processes and the people.

This situation has led to criticism of the mainstream processes adopted by national government and international/multilateral agencies which adopt holistic top-down approaches. There is need to adopt participatory approaches which address issues of ownership of the process while the government and multilateral agencies assume the role of facilitators. It is further argued that “multilateral agencies’ role should be limited to encouraging, supporting, catalysing and legitimising diverse local processes through which the needs and priorities of the people are identified and addressed – through which poverty is reduced and natural resources management improved”

(Satterswaite, 2003:14). The main argument is that development intervention should support local processes and should be community driven using bottom up processes where the local people themselves are accountable (Satterswaite 2003; Commonwealth Foundation, 2013).

Key Challenges and Knowledge Gaps in the Implementation Processes

Several studies and reviews have examined the challenges that emerged from the implementation of the MDGs and came up with concrete recommendations on how to address these challenges. Examining implementation processes in Nigeria, Igbuzor (2011) argues that Nigeria adopted a top down approach which led to several implementation challenges including resistance from Ministries, Departments and Agencies (MDAs); capacity constraints and overemphasis on economic transformation and neglecting social and political transformation which are also essential (Igbuzor, 2011). In the same vein, Lawal *et al.* (2012) identify several challenges which include among others poor funding, lack of conceptualisation and understanding by implementers and would be beneficiaries, over-politicisation by the government lack of strong interactions with beneficiaries, as well as an inadequate capacity to formulate, implement and monitor the processes involved. Other challenges included limited participation by the public, poor information flow and not taking into consideration knowledge generated in other similar undertakings (Commonwealth Foundation, Tanzania Country Report, 2013). In Kenya the following challenges were identified during the implementation processes: inadequate resources to finance some of the MDG sectors; economic, social and cultural practices which impede implementation processes; regional disparities in critical areas such as gender equality and poor quality of data to monitor progress (Kenya, Ministry of Devolution and Planning, 2014).

Inadequate and unreliable data to assess the progress have also been identified as key challenges because most of the implementation processes were undertaken without due attention to the baseline data of the situation. Not only was data lacking but also the capacity to collect and analyse it (Commonwealth Foundation, 2013; UNECA 2015). In this context, obviously knowledge gaps existed in terms of knowledge of the situation and not capturing the knowledge creation processes. Without adequate knowledge of the situation, it is almost impossible to link knowledge to actions on the ground. This is among the major weaknesses in the implementation processes because actions towards sustainable development require relevant knowledge base, knowledge creation and linking knowledge to actions.

Fehling *et al.* (2013) argue that reasons for limited progress of MDGs are diverse and complex. Analysis of challenges emanating from implementation of the MDGs in Africa can be placed into three main groups. First, challenges resulting from the approaches, policies and frameworks adopted or lack of; second are those related to the processes involved (input and output); and the third group are those arising out of the people (implementers and beneficiaries) due to factors such as culture, capacity, participation, ownership, political judgments, and awareness, among others.

Knowledge Management Strategies

Knowledge is increasingly recognised as a key element to achieving success; it is a driving force in steering organisations, governments and societies to achieve a competitive edge and transformative change. Knowledge creation processes are fundamental to socioeconomic development. Therefore, knowledge should be created continuously to achieve results (Canals *et al.*, 2011; Mansour, 2011). For knowledge to make impact there is need to put in place proper mechanisms for its diffusion. The emerging trend to embrace knowledge has led to the emergence of the so called knowledge based societies which are regarded as essential to steer nations towards sustainable development.

There is a general consensus that knowledge management is about getting the right information to the right people at the right time. Knowledge management strategies define the strategic actions needed to foster creation, sharing and its use in organizations (Canal *et al.* 2011). It should be noted that knowledge management strategies are many and varied, their adoption and use depend on different situations and contexts to which the strategy need to be applied. Reviews of literature undertaken by several scholars have identified various approaches and strategies to managing knowledge (Haggie & Kingston, 2003; Canals, *et al.* 2011; Mansour *et al.* 2011).

In their review of knowledge management strategies, Haggie and Kingston (2003) noted a total of six different strategies which are suitable for different contexts. These are (i) knowledge strategy as a business strategy; (ii) intellectual asset knowledge strategy; (iii) personal asset responsibility strategy; (iv) knowledge creation strategy; (v) knowledge transfer strategy; and (vi) custom focused knowledge strategy. They further argue that there are various factors which influence the choice of an appropriate KM strategy - these include among others, knowledge strategy, a SWOT analysis environment, values, organisational culture, organisational structure and nature of knowledge (Haggie & Kingston, 2003).

In the past, adoption and implementation of KM strategies was seen as a domain exclusive to provide organisations and companies with the competitive edge and efficiency needed to maximise innovation and profits. However, increasingly, knowledge management strategies are being developed and applied in the public sector and in development interventions. For instance, the Technical Research Facility (2011) in Pakistan developed a knowledge management strategy with regard to MDGs 4 and 5. The objective was to ascertain how knowledge of the health system with a focus to MDG 4 and MDG 5 can be better managed to support policy making and programme implementation in two provinces in Pakistan. A thorough analysis of the situation in the two provinces focused on four fundamental elements. These are people and human resources, organisational processes and institutional arrangements, tools and technologies and priorities within the context of knowledge management processes of knowledge generation, collection and selection, assessment, sharing and use (Technical Research Facility, 2011).

As noted, knowledge management strategies are developed to meet specific situations and contexts as shown in the one adopted to address MDG 4 and 5 in Pakistan. Zin and Egbu (2010) argue that there are many knowledge management strategies currently being adopted and used in organizations. Each of these has its own strengths, weaknesses, benefits and potential. As such there is no one knowledge management strategy that is likely to lead to successful outcome in all organisations and contexts.

A Knowledge Management Strategy for 2030 SDGs in Africa

Assessment of the progress to achieve the MDGs in Africa between 2000 and 2015 consistently showed that it would be difficult to achieve the MDGs with operating frameworks and approaches which were employed at the time (Commonwealth Foundation, 2013; Igbuzor, 2011; Bayo, 2012; UNECA, 2015). Failure to achieve the MDGs by most African countries by 2015 increasingly led most agencies to re-examine their modus operandi and to come up with more innovative approaches to implementation of the various interventions. These agencies realised that employing a knowledge management strategy is core to the processes of implementation of the MDGs. For instance, the World Health Organization (WHO) developed a knowledge management strategy for its interventions in the health sector and UNESCO Dakar Office also developed one through individual initiatives (WHO, 2015; Miller, 2014). To say the least this realisation came too late to make the desired impact by 2015.

Analysis of the approaches and processes employed to implement the MDGs in African countries revealed serious challenges and limitations that need to be squarely addressed as countries are planning for the implementation of the SDGs. Challenges identified in this chapter such as lack of ownership of the interventions, top down approaches with limited participation of the beneficiaries, lack of knowledge on the interventions and inadequate focus to the key sustainability factors of economic and social transformation need to be considered when adopting appropriate knowledge management strategies.

This chapter did not intend to be prescriptive in character to pin point a specific knowledge management strategy which would be applied to all African countries but rather to raise some key issues for further explorations by experts in conjunction with the key stakeholders. We understand that implementation processes involve inputs and outputs, mediated by activities within strong organisational and institutional arrangements. Successful implementation of SDGs would involve key inputs including financial and human resources which are essential for the realisation of targets. Therefore, an effective knowledge management strategy for Africa should be multi-dimensional in character and should take in consideration all the factors which are critical to register success. Specific knowledge management strategies can be developed for specific goals within relevant sectors as shown in the case of Pakistan.

Conclusion

This chapter concludes that the failure of the MDGs to achieve desired results in Africa in all of the eight goals is due to a combination of factors as discussed earlier. Absolutely, the MDGs were set to address vivid global challenges that have evaded the global community for decades. The desire to assure basic needs of global community are met through combating extreme poverty, assuring good quality education and health services, achieving sustainable use of earth resource and protecting the planet is evident. However, the approaches employed and the processes implemented have been criticized for not taking into consideration key components which are critical to success (Commonwealth Foundation, 2013; Igbuzor, 2011). As African countries and the world community embark on the next fifteen years' journey towards sustainable development through the 2030 Sustainable Development Goals, it is important that plans and processes adopt effective approaches to address the key challenges identified in implementing the MDGs.

Implementation processes should consider the input and output processes and the activities embedded therein. Activities should be specifically precise and targeted taking into consideration local needs and priorities, participation, ownership of the interventions, knowledge creation and communication strategies. An effective knowledge management strategy would consider these key elements, would be focused and targeted to specific contexts of the local communities. National governments have critical roles to play. They should put in place effective policies, excellent development plans and strategies; develop capacities at levels of implementation with adequate human and financial resources, democratic governance structures and supportive environment for proposed knowledge management strategies to contribute to the achievement of the development goals.

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Section Six: Information and Knowledge Management Education

Financial Literacy among Women Entrepreneurs in Kenya: An Overview

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Abstract

There is a strong link between education, literacy, information literacy (IL), financial literacy (FL) financial outcome and economic empowerment. The overall aim of this chapter is to establish financial literacy competence of women entrepreneurs and determine its impact on their economic empowerment. This chapter, informed by a study by the authors, assesses the financial literacy skills of women entrepreneurs in Kenya; their level of economic empowerment; the relationship between women's financial literacy and their economic empowerment and the best model to use for enhancing financial literacy skills of women entrepreneurs of Kenya. A pragmatic research paradigm combining both qualitative and quantitative research methodologies was used through a survey method. The target population comprised women entrepreneurs from Chuka Constituency who had received loans from the Uwezo Fund. The total number of the sample population was 400. Data were collected through detailed questionnaires that had both structured and open-ended questions. Interviews with the Uwezo Fund managers were also carried out. Secondary data were obtained from the relevant literature. The respondents had limited education, largely primary school education; used entrepreneurship to supplement income obtained from elsewhere; had small businesses; and had limited financial literacy skills. Despite the fact that slightly over 50% of the women had control of their finances, the control was limited due to household dynamics that still favoured men. Computation skills were found to be low at an average of 33 of the respondents having the skill. This may have limited their ability to calculate how much debt they could afford. Failure to review available options for financial products and services; low computation skills; lack of control of income and family resources; poor budgeting and saving habits all conspired to hinder women from attaining economic empowerment. Access to credit and education and training in financial literacy should be strengthened in order improve the status of women entrepreneurs in Kenya.

Keywords: *Financial literacy, information literacy, women entrepreneurs, Kenya*

Introduction and Theoretical Background

The background of financial literacy in Kenya was discussed by Kinyanjui and Ocholla (2012) at a conference in Latvia, Riga recently. In 2007, illegal “Ponzi Schemes”, popularly referred to as “Pyramid Schemes” collapsed with approximately USD 360 million of peoples’ savings in Kenya. At least 20 suicides were recorded as a direct result of this collapse. As this happened, the government and the private sector had initiated programmes to empower women entrepreneurs by making funds available to them.

Information literacy dictates how well funds available to women are used for their empowerment. According to the ACRL (2000), information literacy (IL) is defined as an intellectual framework for understanding, finding, evaluating and using information. Bhandary (2000) identifies the types of literacy to include functional or basic literacy, cultural, scientific, computer, and business or financial literacy. The U.S. Financial Literacy and Education Commission define financial literacy as the ability to make informed judgements and to take effective actions regarding the current and future use and management of money. Financial literacy should include the ability to understand financial choices, plan for the future, spend wisely and be ready for life events such as loss, or saving for retirement (Basu, 2005). A person who is financially literate should therefore have the ability to understand the fundamentals of money management including budgeting, spending, saving, investments as well as use of financial products and services like banking, insurance and debt levels. Financial literacy includes basic numeric skills and the information and knowledge to participate as an active and empowered consumer of financial services and government financial assistance programmes (SEDI, 2002).

Research Problem and Purpose of the Study

It has been universally acknowledged that gender divides exist in the world today. Many governments keep reaffirming their commitment to women’s empowerment and to a gender equality perspective so as to overcome this divide. On 2nd October 2007, during the “Americans for UNFPA Gala for the Health and Dignity of Women”, the UN Secretary-General Ban Ki-moon while reiterating the need to support the UNFPA said that “[t]oday, we understand, even better than our founders did, that the empowerment of women is a fundamental condition if we are to make progress towards the goals for which the United Nations was created,” (UN News Centre, 2007). Many people concur that without the empowerment of women, the world cannot talk of lasting peace and security or improved living standards and

respect for human rights. Kenya has committed itself to eliminate the gender divide by enacting policies and availing funds for women entrepreneurs in order to economically empower them. However, the 2007 UN report on Africa presents a mixed picture. Although there has been some progress in many, though not all of the campaign's central goals, the pace of Africa's gains appear to lag behind those of the developed regions (Harbeson, 2007). Lusardi and Mitchell (2007) have clearly established that there is a very high correlation between financial literacy and economic outcomes. Women who are not financially literate are excluded from appropriate low cost, fair and safe financial services that are offered by the mainstream financial providers like banks. It is no wonder then that women were the majority of the members of the recent 'Ponzi Schemes' mentioned above. For as long as this form of exclusion remains, the economic empowerment of women will never happen and the term will remain a mere catch phrase and an ever moving target.

The overall aim of this chapter, informed by a study, is to establish financial literacy competences of women entrepreneurs accessing funds and to determine its impact on their economic empowerment. The authors assess the financial literacy skills of women entrepreneurs in Kenya; the level of economic empowerment of women entrepreneurs; the relationship between women's financial literacy and women's economic empowerment and the best model to use for enhancing financial literacy skills of women entrepreneurs of Kenya. The authors sought to find out the level of financial literacy of women entrepreneurs only with the sole aim of establishing the relationship between financial literacy and economic empowerment. Financial literacy is important but among the explored issues in the developing countries particularly in Kenya among women entrepreneurs. This could be the missing link in women economic empowerment.

Methodology

A pragmatic research paradigm combining both qualitative and quantitative research methodologies were largely used through a survey method. The population was finite and consisted of 105 women groups who had accessed loans from the Uwezo Fund in the financial year 2013/2014. The sampling frame consisted of the list of women groups in Chuka Constituency in Tharaka Nithi County who had benefited from Uwezo Fund in the year 2013/2014. The choice of the location of study was done through convenience sampling. Chuka has a population of 128,107. During the year 2013/2014 it received a total of USD 177,000 from the Uwezo Fund.

Secondly, due to the large numbers of beneficiaries it was impractical to survey the whole population. To ensure that the sample was representative, the study used probability sampling techniques to select participants in the study. Both random and stratified sampling techniques were applied. The number of respondents from each stratum was proportionate to the size of the different strata of enterprises funded. Possible sampling error was considered. Krejcie's model of sample size determination as quoted by KIM (2009:65-66) was used to determine the sample size. The calculation is:

$$n = (\chi^2 Npq) / (d^2 (N-1) + \chi^2 pq)$$

Where n = desired sample size

N = Target population

P = population proportion (take 0.5)

d = degree of accuracy reflected by the amount of error that can be tolerated in fluctuation of a size about the population and corresponds to the significance level with a standard error of the proportion at the corresponding confidence level

χ^2 = the table chi square for one degree of freedom relative to the desired level of confidence ($\chi^2 = 3.841$ at 95% confidence level).

A total of 80 groups were selected. The third stage of sampling involved selecting 400 respondents, 5 in each group or 50% of the members of each group. Data were collected through detailed questionnaires that had both structured and open-ended questions. Interviews with the Uwezo Fund managers were also conducted. Secondary data were obtained from available literature.

Analysis was descriptive as it described the financial literacy skills of women entrepreneurs. Causal analysis that is concerned with the study of how one variable effects change in another variable (Kothari, 2004) was used to determine how financial literacy skills affect women economic empowerment. Discrete data were analysed using the Statistics and Data (STATA) package to generate descriptive statistics such as frequencies (counts) and percentages to describe data on the various variables. Cross-tabulation analysis was also conducted to simultaneously analyse the relationship between two or more variables in the study. A chi-square test of independence was then carried out to assess the degree of association between these variables. For the qualitative data gathered through the open-ended questions, the data

were coded into themes, general patterns and the findings categorised into meaningful constructs that could then be generalized to the rest of the women entrepreneurs in Chuka Constituency receiving loans from the Uwezo Fund.

Results and Discussions

This section presents and discusses the findings of the study which informed this chapter.

Financial Literacy skills of women entrepreneurs

Since financial literacy is a multi-dimensional concept which relates to and overlaps with various other concepts and disciplines (Katy *et al.* 2000), it becomes difficult to put all the skills together, get averages and make absolute conclusions. We therefore decided to rank the financial literacy skills that the respondents seemed to have. Table 1 shows the financial literacy skills that were assessed and the percentage of women entrepreneurs with these skills.

Table1: Ranking of financial literacy skills of women entrepreneurs

Rank	Skill	% of women entrepreneurs with skills
1	Understanding of the need to diversify business	91.93
2	Knowing when information is needed	91.92
3	Being the ultimate decision maker	79.55
4	Shopping for Uwezo loan	78.78
5	Checking account transactions/statements	77.02
6	Understanding of business ventures	59.45
7	Shopping for financial products and service from different financial providers	51.26
8	Not investing in a risky business venture	50.38
9	Basic numeric skills	33.08
10	Considering costs before taking a loan	25.95
11	Feeling of being in control of financial status	20.32
12	Feeling of being very comfortable with the current debt status	16.41

Beal and Delpachtra (2003), while defining financial literacy, stated that the financially-literate should not only have the ability to understand key concepts in money management, a working knowledge of financial institutions, systems

and services and a range of analytical skills, but also possess a facilitating attitude to the effective and responsible management of financial affairs. Out of all the respondents, 91.92% realised that they have knowledge gaps in key concepts in money management and financial institutions, but only 51.26% of the respondents shop around for financial products and services from different financial institution while 15.4% did not shop around at all. Out of the 15.4% respondents who do not shop around at all, 37 (58.73%) of them said they did not do so because they did not see the need for shopping around, 10 (15.87%) respondents lacked time, while 7 (11.11%) thought that there were no huge differences among financial providers. Only 33.08% of the respondents had basic numerical skills required to calculate financial products like loans. This is indicated by the fact that only 25.95% of the respondents considered the cost of the loan before taking it.

A working knowledge of financial institutions, systems and services and a range of analytical skills are critical components of financial literacy. Only 77.02% of the respondents checked their account transaction/statements. Even fewer at 6.31% found it very easy to understand them. From Table 1, 91.93% of the respondents understand the need to diversify their business which is demonstrated by the fact that 52.02% of the respondents had other businesses or forms of paid employment. However, the respondents were not adequately analytical as only 49.62% of the respondents had the business sense of not investing in a risky business venture.

Hogarth, as quoted by Worthington (2006), found that most definitions of Financial Literacy include knowledge and understanding of basic financial concepts and choices in areas of banking, savings and borrowing, spending wisely, debt control, good financial planning for the future so as to be ready for life events such as job loss or saving for retirement and the ability to use these to plan and implement financial decisions. Using this definition, only 20.32% of the respondents felt in control of their financial status and one of the reasons could be due to over borrowing as only 16.41% felt very comfortable with their current debt status.

Women entrepreneurs' economic empowerment

Cheston and Kuhn (2002) list the following as some of the universally accepted indicators for women economic empowerment: women's control over income; relative contribution to family support; access to and control of family resources; women's access to employment; access to credit; access to markets; and representation of women's economic interests in macroeconomic policies, state and federal budgets.

Women's control over income

Results from the study indicate that only 315 (79.6%) of the respondents were the ultimate decision makers when it came to their businesses. Twenty nine (7.3%) said it was their business associates, 28 (7.05%) said it was their partner/spouse, 8 (2.02%) said it was their family members and 4 (1.01%) said it was their friends. This lack of control has weakened the respondents' capacity to save. Out of the total respondents, only 178 (44.95%) saved on a regular basis. Without regular savings, women may not be able to acquire economic empowerment as they would almost never be able to overcome financial challenges or take up a good financial opportunity.

Women's control of family resources

Financial capability is commonly referred to as an individual's capacity to make financial decisions and judgments that contribute to his/her immediate and long-term financial security (CPRN Research Report, 2007). The majority of the respondents (63.38%) were solely responsible for money management in their households; 30.56% of the respondents were jointly responsible with their partners, while 3.78% of the respondents said it was their partner. We cannot talk of women economic empowerment in situations where the woman entrepreneur is not the ultimate decision maker, but their spouse/partner is, when it comes to money management at the household level. This weakens the respondents' ability to respond effectively to life events especially those that require them to make every day financial decisions (Fannie Mae Foundation, 2002).

Relative contribution to family support

Most of the respondents (52.14%) indicated that they did have an additional business apart from the one funded by loans from Uwezo Fund against 46.35% who did not. Only 16.12% of the total respondents had been in their current business for more than 10 years. This and the fact that 125 (31.49%) of the total respondents were employed and not carrying out their businesses on a full time basis was evidence of their contribution to family support.

Women's access to employment

One hundred and twenty five (31.49%) of the total respondents were employed against 197 (49.62%) who were not. Seventy five (18.89%) of them did not give a response. Out of those who were employed, 45 (36%) of them were on full-time employment, 36 (28.8%) were on part-time employment while 44 (35.2%) of them were on casual employment. Ability to get paid employment is determined by the level of education.

Access to credit

Access to credit is one of the measures of economic empowerment, and from the study 33.08% of the respondents had access to loans other than the one from Uwezo Fund. The only challenge is that 21.21% of the respondents indicated that they did not shop around. For those that shopped around their main source of information was friends and family. Seven (5.34%) took a loan simply because of its availability and only a mere 5 (3.82%) of the respondents considered their financial need at hand. Respondents were accessing funds from the bank with 194 (48.99%) of the total respondents using Uwezo services, 92 (23.23%) a *Chama* and 82 (20.71%) a Sacco. These three provide financial services to more than 92% of the total respondents. On owning savings account, 232 (58.59%) of the total respondents had a savings account either individually or jointly with someone else.

Budgeting and saving

Women entrepreneurs are aware of financial concepts like budgeting and saving but appear to have some difficulty in implementing this knowledge effectively. Only 30.89% can be said to be disciplined planners as they make a written record of their expenses.

Relationship between women's financial literacy and women economic empowerment

The authors established that financial literacy skills greatly contribute to women economic empowerment. However, this was only true where knowledge and practice were in tandem. For example, 235 (59.34%) respondents agree with the statement that a business with a high return is likely to have higher than average risks but 39 (9.85%) of the total respondents still went on to say that they would invest heavily to maximize their return and only 132 (33.33%) of the total respondents said they would consider the investment "too good to be true" and not invest.

Positive feelings of one's debt status are a sign of Financial Literacy skills. Out of the 85 respondents who do not check their financial statements, 28 (32.94%) of them were very uncomfortable with their current debt, compared to 10 (11.76%) of them who were very comfortable with their current debt. There was a 5% level of significance between checking financial statements and thoughts on current debt. Women who do not check their financial statements were more likely to feel uncomfortable about their current debt.

Management of household expenditure is an indicator of women economic empowerment as it gave them a feeling of being in control of finances. A recent study by the Special Unit on Microfinance of the United Nations Capital Development Fund (UNCDF) (2005) found that a woman's success benefits more than one person as they are more likely than men to spend their profits on household and family needs. However, the question has always been: does access to finances or income necessarily lead to women economic empowerment? The answer is 'no' as family dynamics may hinder them from managing the funds. The authors confirm this as out of the 251 respondents who said that they were mainly responsible for money management in their household, only 17 (6.11%) said they felt that their current financial situation was out of control all of the time. The authors further established that there was a statistically significant relationship between the person mainly responsible for money management in one's household and the feeling about one's current financial situation, at 5% level of significance.

Ability to check financial statements and keeping written records to keep an eye on all expenses are two Financial Literacy skills that are highly correlated and are also indicators of women economic empowerment. Out of the 85 respondents who said that they did not check their financial statements, 8 (9.41%) respondents said that they used written records to keep a close eye on expenses. In comparison, out of the 304 respondents who said that they did check their financial statements, 112 (36.84%) respondents said that they used written records to keep a close eye on expenses. By keeping written records to help them keep an eye on expenses, women are more likely to become economically empowered as they would be able to control household expenditure, which in turn would enable them to pay their debts and ultimately feel good about their financial situation.

Model for enhancing Financial Literacy skills of women entrepreneurs in Kenya

Majority of the respondents indicated that they need financial advice on financial/business management and/or writing business plans (58.73%); financial record keeping (33.67%) and financial products like loans, insurance policies and shares. (3.29%) but what was surprising was the choice of the training method. Out of the total respondents, 274 (68.84%) of them preferred the information be made available through seminars/conferences/workshops, while 38 (9.55%) of them preferred word of mouth.

Since the respondents seem to prefer models where they interact with others, the authors propose that financial institutions use seminars, conferences and workshops to train the women entrepreneurs on various relevant skills.

Support to respondents where they would consolidate their learning may be done through the 'Chamas'. The integrated approach that the government is using where it provides the loans and some level of financial education should continue. This is what Grameen Bank (2007) refers to as "Credit with education". However, the government training should be strengthened by having more field officers.

Conclusions and Recommendations

The study found that respondents had limited education, largely primary school education, used entrepreneurship to supplement income obtained from elsewhere, had small businesses and did have limited financial literacy skills at various levels. Despite the fact that slightly over 50% of the women had control of their finances, the control was limited due to household dynamics that still favoured men to control family finances and this prevented them from taking charge of their financial affairs. Computation skills were low at an average of 33.08% of the respondents. This may have limited their ability to calculate how much debt they could afford. In order to decrease poverty among the women, the government and partnering financial institutions need to invest in training the women in financial matters. The mode of training should be seminars and workshops.

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Tracing the Graduates of Diploma of Technology in Library and Information Science and Archives and Records Management Studies of The Technical University of Kenya

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Abstract

Tracer studies are important tools for educational planners and other stakeholders as they can provide valuable information for evaluating institutions of higher learning. This chapter traces the graduates of Diploma in Technology in Library and Information Science and Diploma in Technology in Archives and Records Management from the Technical University of Kenya, between the period of 2013 and 2015. The purpose of the study informing this chapter was to investigate job placements of the graduates in order to establish their current activity, utilisation of skills and whether their education and training meet employer expectations. Quantitative methods were used to collect data using structured questionnaires hosted on Survey Monkey. Data were analysed automatically by Survey Monkey. A total of 134 responses were received and used. The findings indicated that the majority of the respondents worked in full-time jobs, in the public and private sectors. A number had not secured jobs, whilst others enrolled for further studies, with the majority choosing The Technical University of Kenya. The graduates indicated that they were satisfied with the curriculum but felt that it could be enhanced by including more practical classes on ICTs and introduction of sign language. The study generated data that the department can use in improving, planning and managing the curricula.

Keywords: *Curricula, information, knowledge management, library and information science, tracer studies, archives and records management, The Technical University of Kenya*

Introduction

The success of the Kenyan economy depends on the quality of its human resources which is, in turn, linked to the effectiveness and efficiency of its education and training institutions. Throughout the world, countries are engaged in creating synergies between the needs and purposes of their educational training systems, the local and regional labour markets, and their national economies. This is as a result of international consensus which, though largely contested, states the need for people and organisations to embrace new skills and knowledge at regular periods in order to meet the challenges of a much more dynamic and unstable economic climate (Unwin, 2003). Such developments ask key questions about the national education systems in terms of curriculum content, teaching, skills acquisition and expertise of educational professionals, among others.

Tracer studies are alumni surveys that attempt to track activities of graduates of an educational institution. These are a form of empirical studies which are considered as an appropriate means of evaluating the results of the education and training provided at a given institution. It is necessary for any programme of study to constantly evaluate its curriculum to ensure the relevance of its content and to keep it in tune with the demand of the job market (Peng & Zhang, 1997).

The effectiveness of tracer studies depends on how close the study is conducted from the time of graduation. If tracer studies are conducted more than three years after graduation, they have several drawbacks with the main one being retrospection bias as the long period often results in information obtained being less relevant (Renny, Chandra, Ruhama & Sarjono, 2013). If done immediately after graduation, as an exit study, it is likely to be plagued by poor transition of the respondents due to unstable work situation as many graduates may not have found a job. Renny *et al.* (2013) and Royal University of Phnom Penh (2015) recommend that tracer studies should be conducted 1-3 years after the graduation of the respondents.

Statement of the Problem

The Technical University of Kenya (TUK) was awarded a charter in 2013 though its roots can be traced to the Kenya Polytechnic which was founded in 1960. TUK has so far graduated 2,323 diploma graduates in Archives and Records Management as well as Library and Information Studies. The first group of Diploma in Technology in Library and Information Science (DTLIS) and Diploma in Technology in Archives and Records Management (DTAR) students graduated from TUK in 2013.

The Department of Information and Knowledge Management does not maintain an effective database or records of its graduates after graduation. This poses difficulties in establishing where its graduates are, what they do, whether their education and training meet employer expectations and the challenges that they face. Lack of such information makes it difficult to structure the curriculum in order to ensure that current students acquire the knowledge and skills required in the real world. The results of this tracer study can be used as a planning resource for educational curricula. The objectives of this study were to: establish the activities performed by the DTLIS and DTAR graduates; investigate how the graduates utilised the skills acquired in their respective programmes, establish whether their education and training meet employers' expectations; and identify areas of the curricula that may require improvement.

Methodology

A survey of DLIS and DTAR graduates was conducted between April 2016 and June 2016. The study targeted students who graduated from TUK between 2013 and 2015. Data was collected using web-based structured questionnaires hosted on Survey Monkey. In order to trace more students for the survey, snowball sampling technique was utilised. This was done by compiling a list of graduates' phone numbers obtained from the respective class representatives for the period under study as well as from the feedback obtained from the questionnaires and anybody who had information about any DTLS and DTAR graduate. The sample was 134 graduates. Data were analysed using the Survey Monkey.

Findings and Discussions

The findings of the tracer study are presented and discussed in this section

DTLIS and DTAR Graduates 2013-2015

As indicated in Table 1 majority (119) of the graduates were from the DTLIS major. It is interesting that despite the doubt on the future of Library Science it is a popular course and has attracted a big number of self-sponsored applicants.

Table 1: Diploma in technology graduates 2013-15

Programme	Number of graduates per year			
	2013	2014	2015	Total
Diploma of Technology in Library and Information science	37	61	21	119
Diploma in Technology in Archives and Records management	26	55	23	104

On the other hand, the majority of sponsored students pursued DTAR and were mainly government employees. Katuu (2015) echoes the above findings by stating that due to increased population in the 1990s and 2000s, the Government of Kenya launched an extensive training programme to improve public services delivery and to improve infrastructure through effective record keeping systems. This created an influx of sponsored students pursuing courses due to the demand for qualified personnel in the public sector. However, the number of students from the public service has reduced gradually in the subsequent years.

Mode of Study

When the respondents were asked to indicate their mode of study, part-time students emerged the majority 100 (75%) in the two categories. Full-time students comprised 34 (25%) of the respondents. It is of interest to note that of the two courses, the DTAR had more part-time students.

Funding

It emerged that the majority 121 (90%) of the respondents were privately sponsored students. The authors also found that the majority 74 (55%) of the respondents were in the age bracket 20-29 years and 60 (45%) were over 29 years. These findings are attributable to the fact that the respondents joined the course soon after completing secondary school usually at 19 years as privately sponsored students with the support of either self, parents, guardians or other sponsors. The study findings indicate 13 (10%) of the respondents were sponsored by their employers and were working for the same employers. These findings indicate that the employers may be reluctant

to sponsor their staff at this level of education. The high number of privately sponsored students demonstrates their desire to improve their skills and advance their education.

Activities after Graduation

One of the areas of interest in this study was to establish what the respondents did after graduation. The findings indicate that 50 (37%) obtained employment, 52 (39%) went for further studies while 32 (24%) did not secure jobs. It is gratifying to note that of the 50 (37%) who had obtained employment 23 (47%) pursued further studies. There is also a considerable number 32 (24%) who have not secured any form of employment. Their inability to secure employment could be attributed to the high unemployment rates in Kenya and competition for limited jobs.

Employment Status

The study further investigated the employment status of the 50 respondents who had secured jobs by the time of research. The majority 37 (74%) of the respondents who had secured jobs worked on a full-time basis while 13 (26%) are in part-time employment. Table 2 summarises these findings.

Table 2: Employment (n=50)

Current Employment Status	Frequency	Percentage
Working full-time	37	74%
Working part-time	13	26%
Total	50	100%

Identification of Job Opportunities

The study further sought to find out how those employed identified the job opportunities. As indicated in Table 3, the majority 27 (54%) of the respondents obtained the jobs through advertisements in the media. The other respondents indicated their sources of job information as friends and relatives 11 (23%), internship 8 (15%) and the Department of Information and Knowledge Management 3 (7%).

Table 3: Source of Employment information (n=50)

How did you hear about your current job?	Frequency	Percentage
Advertisement in media	27	54%
Internship	8	16%
Through friends and relatives	11	22%
Through IKM department	3	6%
Others	1	2%
Total	50	100%

It is evident that internships offer a viable route to employment for students and this validates the internship programme in the department. It was interesting to note that friends and relatives are a good source of job recommendations. This finding is echoed by studies such as Brown *et al.* (2003) that affirm a variety of means of finding employment such as through relatives, personal contacts and family enterprises.

Sector of Employment

The findings indicate that a substantial proportion 36 (72%) of the respondents who were employed are in the public sector whereas 14 (28%) are in the private sector. This illustrates that the public sector is the most viable source of employment for DTLIS/DTAR graduates. This finding could be attributed to the fact that most of libraries and archives are in government departments, universities, colleges and schools. The private sector is not far behind given that there are many international organisations and Non-Governmental Organisations in Kenya that are running information centres.

Job Placement

One of the aims of the study was to establish if the respondents got ‘job-fit’ in their place of work. This was necessary since cases are known of employers assigning duties to staff that are not within their areas of specialisation or training.

Of the 50 respondents who were employed, 25 (50%) were in archives and records management, 21 (42%) in libraries while a small proportion 4 (8%) were working in fields not related to their study. It is evident that there is a correlation between training and work placement and this could be attributed to the fact that mature students consciously select courses that are related to their career and employment prospects.

Job Designation

The majority of the respondents 38 (75%) are largely within junior level, 4 (8%) in senior management, and 9 (17%) found in mid-level management. In most sectors, the entry point for diploma holders is at lower ranking posts, performing operational tasks. A small proportion of the respondents were at senior level since the requirement for this level is a degree holder.

Job Satisfaction and Retention

The study investigated whether the respondents were satisfied with their jobs. The findings show that a large percentage 42 (84%) were not satisfied with their jobs. When asked whether they intend to retain the same job, the study revealed that 35 (70%) expected to change their jobs while 15 (30%) had no intention of changing jobs. This resonates well with a study done by Bernstein (2011) which found that only 40% of librarians and 27% of non-professional staff expect to work in the same library for five years.

Progression of Studies

It was expected that not all graduates will obtain employment immediately after completing the diploma course. It was, therefore, imperative to establish other pursuits for the alumni after graduation. The findings indicate that a significant proportion 40 (80%) of the respondents come back to TUK for further studies while 10 (20%) proceeded to other universities.

As illustrated in Table 4, the respondents who came back to study in TUK, gave the reasons for this choice as quality and reputation 33 (66%), convenience 13 (26%), proximity to CBD 13 (26%) and alumni effect 13 (26%).

Table 4: Reasons for Returning to TUK

Reasons for returning to TUK	Frequency	Percentage
Quality and Reputation	33	66%
Fees (convenience and affordability)	13	26%
Convenience (proximity to CBD)	13	26%
Familiarity (alumni effect)	13	26%

The study further investigated the courses that the respondents pursued after graduation. It emerged that the largest proportion, 36 (72%), pursued Bachelor of Technology (Information Studies), 4 (8%) the Bachelor of Science and 10 (20%), other short courses such as Spanish Language by one respondent.

As indicated in Table 5, the respondents gave various reasons for furthering their studies. A total of 20 (40%) indicated academic progression, 10 (20%) knowledge advancement, 8 (16%) promotion while 2 (4%) studied to obtain a job. This study concurs with that of Chand and Dheer (2009) that indicated that the main objective of the training is to enhance competencies, upgrade the skills and improve the ability and efficiency of LIS professionals in their respective information centres.

Table 5: Reasons for pursuing further education (n=50)

Reasons	Frequency	Percentage
Knowledge advancement	10	20%
Promotion	8	16%
Job placement	2	4%
Academic progression	20	40%
Others	10	20%
Total	50	100%

Utilisation of Skills

The study sought to find out how prepared the graduates were for the job market. As illustrated in Figure 1 below 67% of the respondents gave a positive response; 20% gave a negative response while 13% were unsure. The 20% respondents who gave a negative response cited inadequate practical and computer skills for their dissatisfaction.

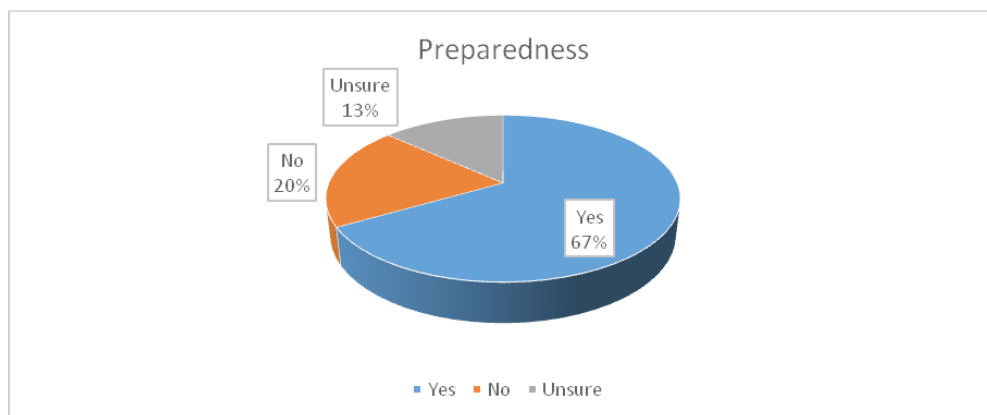


Figure 1: Relevance of skill set to work situation

Current Job Activity

The respondents who were employed were asked to list the main activities that they performed. For those in the library the activities included and not limited to cataloguing information materials, shelving information materials in the library, classifying books, creating and updating e-resources, answering readers' inquiries, accessioning, serials management, maintaining and issuing information materials, maintaining order in the library and registering users.

For the archives and records managers, the major tasks included records sorting, classification, appraisal, arrangement, boxing and labelling, account opening, registration of new members, archiving, indexing and classification of physical files, retrieval and arrangement of physical files, creating files in the system, updating member details, shelving loan forms, ATM application and M-SACCO, managing personnel and other records.

The activities outlined above echo a study done by McCleskey (2003) which proved that paraprofessionals and technical staff are higher-level support personnel who normally would be supervised by professionals. Their job duties require special knowledge, skills, abilities or education as well as decision-making abilities.

Curriculum Assessment

This study sought to find out whether the education and training the graduates received met employer expectations and to establish areas of the curriculum that require improvements. The study was interested also in finding out what motivated the graduate to pursue the programme and the contributions of the curricula.

Table 7: Course rating

Curriculum Attributes	Rating Scale 1-5, 1 as Lowest and 5 as Highest				
	1-Not at all influential	2- slightly influential	3- moderately influential	4- very Influential	5 extremely influential
Enhanced Academic Knowledge	0(0%)	0(0%)	13 (10%)	60 (45%)	60 (45%)
Improved Problem-Solving Skills	0(0%)	0(0%)	13 (10%)	54 (40%)	67 (50%)
Improved Research Skills	0(0%)	20(15%)	7 (1%)	54 (40%)	54 (40%)
Improved Learning Efficiency	0(0%)	7(5%)	13 (10%)	47 (35%)	67 (50%)
Improved Communication Skills.	0(0%)	7 (5%)	13 (10 %)	27(25%)	87 (65%)
Improved Information Technology Skills	0(0%)	7 (5%)	20(15%)	47 (35%)	60 (45%)
Enhanced Team Spirit	0(0%)	7 (5%)	7 (5%)	47 (35%)	74 (55%)

It is evident from Table 7 above that the respondents perceive the curricula as having greatly contributed to their personal knowledge, skills, and attitude growth. Attributes of the curricula such as improved communication skills, 87 (67) enhanced team spirit, 74 (55%), improved problem-solving skills, 67 (50%), enhanced academic knowledge, 60 (45%), improved research skills 54 (40%) were all rated as having influenced the respondent personal knowledge, skills, and attitude.

Table 8: Relevance of the curriculum to Job Market

Attributes of Curriculum	Relevance of the curriculum to Job Market		
	1-Poor	2- Somewhat Relevant	3- Excellent
Enhanced academic knowledge	0 (0%)	27 (22%)	94 (78%)
Improved problem-solving skills	0 (0%)	20 (17%)	101 (83%)
Improved research skills	0 (0%)	34 (28%)	87(72%)
Improved learning efficiency	0 (0%)	34 (28%)	80 (71%)
Improved communication skills	0 (0%)	20 (17%)	101 (83%)
Improved information technology skills	0 (0%)	54 (28%)	60 (72%)
Enhanced team spirit	7 (6%)	13(11%)	101 (83%)

The respondents were asked to indicate the relevance of the diploma programmes to their present jobs. It emerged that the curricula were highly rated as indicated in Table 8 above. The respondents who felt that the curricula were excellent gave the following attributes: improved problem-solving skills 101 (83%), improved communication skills 101 (83%) and enhanced team spirit 101 (83%) with an equal rating. The other attributes that received highest ratings were enhanced academic knowledge highly 94 (78%), improved research skills 87 (72%), improved learning efficiency 80 (71%), and improved information technology skills 60 (72%).

Table 9: Strength and Weaknesses of Diploma Programme

Quality and Strength Of Curriculum	Rating of Curriculum				
	1- Very Poor	2- Poor	3- Fair	4- Good	5- Excellent
Range of courses offered	0(0%)	0(0%)	13 (10%)	80(60%)	40(30%)
Number of optional subjects	0(0%)	7(7%)	0(0%)	94(70%)	34(25%)
Relevance to professional requirements	0(0%)	0(0%)	7(5%)	47(35%)	80(60%)
Extracurricular activities	7(5%)	20(15%)	67(50%)	40(30%)	0(0%)
Problem solving	0(0%)	13(10%)	0(0%)	87(65%)	34(25%)
Inter-disciplinary learning	0(0%)	7(5%)	20(15%)	54(40%)	54(40%)
Work placement/ attachment	0(0%)	13(10%)	0(0%)	67(50%)	54(40%)
Teaching/ Learning environment	0(0%)	20(15%)	20(15%)	67(50%)	27(27%)
Quality of delivery	0(0%)	7(5%)	13(10%)	67(50%)	47(35%)
Teacher Student Relationship	0(0%)	7(5%)	0(0%)	74(55%)	54(40%)
Library/ Lab etc.	7(5%)	7(5%)	34(25%)	47(35%)	40(30%)

Table 9 indicates that the quality of the curricula were rated high, as EXCELLENT and the major attribute to this was the relevance of the programme to professional requirements 80 (60%).

The respondents who rated the course as GOOD gave the following attributes: range of courses offered 80 (60%), number of optional subject 94 (70%), problem solving 87 (65%), inter-disciplinary learning 54 (40%), work placement/attachment 67 (50%), teaching/learning environment 67 (50%), quality of delivery 67 (50%), teacher-student relationship 74 (55%). 67 (50%) of the respondents also rated extracurricular activities as FAIR.

Some of the areas rated as POOR were work placement/attachment, 20 (15%), teaching/learning environment, 20 (15%) and quality of delivery, 7 (5%). Although insignificant, 7 (5%) of the respondent's rated library/lab and extracurricular activities 7 (5%) as VERY POOR.

Suggestions for Curricula Improvement

This study sought the views of the respondents on the areas of the curricula that needed review. There were varied suggestions, but the key ones included:

- In-depth ICT, competencies, and skills;
- Emphasis on practical areas such as cataloguing, classification and indexing;
- Introduce courses for aiding persons with disabilities;
- Additional units on archive and records for library science students.

Conclusion

The purpose of this study was to make a contribution to an under-studied topic in public universities in Africa. As indicated earlier, the topic has been thoroughly investigated and reported on, but mainly from a western perspective. Thus, it is intended that it would be to the benefit of public universities in the developing countries to bring to the fore a topic which is of such immense importance. It emerged from the study that not all graduates had secured jobs due to limited opportunities and mismatched in skills to some extent. However, the majority of the graduates have secured jobs or enrolled for further studies. The majority of those who are working are performing functions in line with their training.

Recommendations

The study identified the following as areas of the curricula that require improvement:

Curriculum Design

- Add more ICT content to the curricula so as to build, competencies and skills in the area in line with the changing technological trends.
- Integrate more practical teaching methods in areas of cataloguing and classification.

- Introduce courses on information service provision to persons with disabilities.
- Include more archive and records management units in Library Science curriculum.
- Conduct regular market research.

Curriculum Implementation

Resources

- Buy/provide more research books that students can read in the Library to supplement class work.
- Add new / current collections in the library.
- Introduce more print documents in the library.
- Equip computer labs in the department.

Administration

- Curb lecturers' absenteeism and lateness.
- Deepen guidance on research projects.
- Complete the stipulated syllabi.
- Connect the graduates to the potential employers.

Implication of the Study

The authors hope that the issues raised in this study will provide adequate impetus for further research in other academic institutions in Kenya. The focus of this study was to trace the graduates of Diploma in Technology in Library and Information Science and Diploma in Technology in Archives and Records Management from The Technical University of Kenya between 2013 and 2015. The aim of the study was to investigate their job placements, current activities as well as how they utilise their skills. Further research is required to incorporate policy makers and employers in order to gauge their perceptions of the graduates with regard to the role of LIS education in national development.

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Next Generation of Library and Information Science Practitioners: The Way Forward for Infusing New Skills and Competencies

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Abstract

This chapter, resulting from a desktop research study, examines the characteristics, skills and competencies required of contemporary library and information science practitioners and that of the next generation. Literature available to the authors as at the time the chapter was written were adequately reviewed combined with practical experiences from the workplace formed the basis upon which the findings were made and conclusion drawn. The new skills and competencies required to operate in today's environment and that of tomorrow identified; the strategies for infusing these skills and competencies are highlighted; and the challenges associated with the infusion of the new skills are outlined. The landscape of information services has been dramatically transformed by the integration of ICTs in library services. The authors therefore submit that the next generation of library and information science practitioners must be adequately repositioned if the profession is to remain relevant and occupy its position as the major information services provider both in this generation and in future. The authors focused on the next generation of library and information science professionals with an emphasis on the way forward for infusing new skills and competencies to enhance efficient delivery of library and information science services.

Keywords: *Competencies, information services, library services, next generation practitioners, skills*

Introduction

The landscape of information services has been dramatically transformed by the integration of Information and Communication Technologies (ICTs) into library services. The present infosphere is quite different from the traditional one. The changing role of library and information professionals as information and knowledge managers in this changing dispensation emphasises the need for them to continuously acquire new skills and competencies required to tackle the challenges and respond to the demands of the contemporary information environment. Libraries are like living organisms, as such they are expected to adapt to new ways of providing information services (Yemi-Peters, 2011). Librarians in the emerging information society need appropriate competencies and skill sets that fit effectively in the role of knowledge managers in the fast changing information society (Oriogu, Ogbuiyi, Etu & Umahi, 2015). The skills acquired in Library and Information Science (LIS) schools are inadequate in empowering the professionals to keep pace with the changing needs of the society. Any information professional desiring to remain relevant needs to acquire new skills. This can be through diverse forms of continuous development programmes (Aina, 2008). The need for infusing new skills and competency was underscored by Zaid (2008:46) who stated that:

“...as information professionals, it is very dangerous to stay local. We must continue to keep pace with the changes in our role as the principal providers of information services. The current issue is no longer whether information technology applications are relevant to library operations; the critical decision is on how best to apply information technology systems to library and information services”.

Roles of Traditional Librarians

Ola (2011) citing Conable (2000) explains that at the time library movement began, books and education were scarce. Today, the quantity of information resources that is generated and distributed is increasing exponentially. The issue of scarcity is superseded now by the new problem of access. But the essential function of the library has not changed. It remains to offer knowledge and information to the average citizen who cannot afford, with individual resources alone, to secure all the information necessary to meet his or her self-defined needs in a complex and challenging world. The role of librarians for centuries has been to provide information but librarians now have the opportunity to use modern tools to provide quicker, more sophisticated, user-friendly service (Yemi-Peters, 2011). Ezeala, Alabi and Nduka (2011)

citing Obi (1977) explained that the old roles of librarians were categorised as administrative and professional duties. The administrative duties included the development of library policies, planning the library budget, supervising and organising the library, coordinating the library system, maintaining accurate library records, publicising the library, training and continually revising the library programme. The professional duties are book selection, classification and cataloguing, implementation of appropriate circulation systems, conducting a programme of reading guidance and aligning the library programmes, collection and services to the needs of the users.

Sridhar (1999) explains that the training librarians received in the past was meant to build their capacities to perform those roles. However, he points out that one undesirable feature of the training of LIS professionals in the areas of classification and cataloguing as well as in ICTs during the last decades is that there has been a lopsided emphasis on specific schemes, systems, software or languages. Conversely, the general underlying principles, concepts and techniques were not given their due importance. This implies that the training given in the library schools some years ago do not match the demand of contemporary society. It is widely acknowledged that the professional tasks that librarians perform and the services offered are being challenged continually on the basis of ICTs. Abubakar (2010) explained that the traditional ways of providing services in the information centres are paving way for a more sophisticated means that requires technological skills and knowledge of computers, telecommunication, microelectronic facilities, the Internet and search engines, networking as well as knowledge of library automation software.

Roles of Modern Librarians

According to Shehu and Amako (2013), the 21st century librarian is a knowledge worker that has the capacity to add value and make libraries more helpful and user-friendly. The changing role of the 21st Century librarian requires that s/he becomes competent in technological skills and teaching as well as writing skills (Nkiko, Lio & Osayande, 2008). In other words, the key force that is driving the 21st Century librarian is technology. Therefore, possession of technological skills is important in the new information environment. The role of the librarian has changed from that of merely acquiring, organising, storing and making information accessible to users. Instead, modern librarians work as information strategists, data managers, digital operators and information dispensers (Odion & Adetona, 2009).

Another emerging role of librarians leans towards a community development whereby librarians act as facilitators and partners in the development of social capital for their local communities. In doing so, libraries can collaborate with other community agencies committed to a similar vision. This has necessitated a change in the way librarians perceive their roles and services. In some cases, this has led to a redefinition of services and products. For instance, selective dissemination of information (SDI) is now redefined as “Strategic Information Dissemination”. This is because librarians have to re-strategise to meet the users of information products and services at the various social media platforms. Also, ICTs are now used in offering customised services such as Online Document Delivery Services (ODDS). Similarly, Virtual Reference Services (VRS) have taken over the place of conventional reference services while the conventional literature search has also been redefined as Online Bibliographic Search Services (OBSS). At the same time, the usual library publicity has been redefined as Marketing of Information Services (MISs).

The Next Generation Library Environment

The next generation information environment is defined by the following characteristics:

- Paperless: There is the possibility that future librarians will function in a paperless library environment (PLE). Rendering of information services will be through the application of ICTs.
- Mobile library: The next generation of librarians will not just be stationed in a room taking care of printed resources or other library equipment. Rather, the librarians will be on their mobile devices around the clock because that is where the users will be found, and there can be no library if there are no users.
- Internet-enabled services: The next generation library will not provide any meaningful information service without the Internet. Any form of information service in the nearest future will be Internet-enabled.
- Virtual reality: The future generation library will operate fully in the space of virtual reality. There will be no physical boundaries, barriers or limitation.
- Market-oriented: The next generation librarians are going to operate in a market-oriented service environment. Marketing of information services is one of the secrets of future library usage. Instead of users coming to the

library, librarians as professionals and information providers, would be going out to the users and providing the services where they are. This will be achieved through the use of multiple techno-based channels preferred by the users.

New Skills and Competencies Required to Operate in Contemporary and Future Libraries

The next generation librarians will require the skills below:

- Computer literacy skills: Computers have been acknowledged as the backbones of information and communication technologies. Librarians, therefore, will require computer skills to operate in the new library environment. The ability to use computers in the 21st Century is considered as one of the basic skills required for one to live a meaningful, enlightened and productive life (Abubakar, 2011).
- Digital skills: The next generation library and information professionals will be digital librarians equipped with digital skills. As noted by Anyakoha (2005), the information accessible in the web is massive and continues to multiply. The librarians who have digital skills and expertise will be recognised as search experts. Digital librarians with the required expertise will contribute meaningfully by playing a leading role in the globally networked society. Digital literacy will empower the librarians to navigate, evaluate and create information using a wide range of digital technologies.
- Digital bibliographic skills: As volumes of documents are released to the World Wide Web (WWW) every second, possessing Digital Bibliographic Skills (DBS) is non-negotiable. With this skill, next generation librarians will filter and organise the documents to enhance their accessibility.
- Organisational skills: Skills in information organisation will be more necessary than ever before. Information availability alone does not bring about satisfaction. It is its access and use that will determine user satisfaction. However, for available information to be accessible, it must be identified and organised in a manner that enhances its findability. This is where the organisational skills become a necessity.
- Digital indexing and abstracting skills: Sridhar (1999) pointed out that as information sources grow rich and complex, information professionals are required to create indexes or other appropriate tools and techniques

to enable customers to determine which sources are more useful than others. The implication is that library and information professionals must possess indexing and abstracting skills applicable to the digital environment.

- Knowledge management skills (KMS): As library users migrate from the information age to the knowledge age, it is also imperative that library and information science practitioners should be well equipped with knowledge management skills. This is not just the gathering of information; it includes managing information organisations, information resources, information services and application of information tools and technologies to knowledge management.
- Technological competencies: The next generation library and information professionals will offer products and services that are technologically inclined. This requires that they should be equipped with the basic skills in the use of appropriate software and hardware applications to offer library and information services.
- Collaboration skills: The next generation librarians must possess the ability to collaborate with other stakeholders in the information industry and beyond. Librarians no longer monopolise the information sector; it is now a competitive environment with many allied disciplines performing similar functions. Furthermore, the increasing use of systems and technologies has put some organisations in competition with libraries over information provision. There is an illusion among many youths that they have no need for the libraries as long as they are connected to the Internet. This implies that there will be a need to collaborate with allied disciplines in order to acquire multi-dimensional skills that would keep librarians relevant and functional in the new library environment.

Challenges to Acquisition of New Skills and Competencies

In their efforts to gain new skills and competencies, the next generation librarians must take cognisance of the following challenges:

- Lack of effective practical sessions: As noted by Sridhar (1999), the sessions described as “practical” in the traditional LIS schools hardly impart meaningful skills that can be useful in the work place.
- Resistance to change: Many information professionals are not willing to embrace the use of ICTs in enhancing information accessibility and dissemination.

- Lack of uniformity of curricula used in training of librarians: The curricula used in the training of librarians and other information professionals are not uniform. Various institutions have their own curricula though based to some extent on the guidelines of accrediting agencies.
- Lack of infrastructural facilities: In developing countries, infrastructural facilities like electricity, transportation systems, and telecommunication networks are not well developed. In Nigeria, there is epileptic power supply of less than 1000 mega watts. This situation will no doubt affect the integration of technologies to library and information services.

The Way Forward

The following actions have the potential to expedite the transition into the realms of next generation librarianship:

- Re-engineering of LIS curricula: To effectively prepare information professionals capable to fit in the next generation library environment, there is need to re-visit the curricula used in the training of library and information professionals, especially in the developing countries. It is not possible to use outdated curricula to prepare the future librarians and expect them to become miracle professionals. In the words of Buarki and Mark-Hepworth (2011), as new ICT skills are identified, LIS curricula need to be revised to incorporate new skills. Abubakar (2010) opined that with the rising demand for ICT knowledge and skills from information professionals and librarians, library schools should be seen as the building blocks for this transformation.
- Exploring self-development opportunities: Librarians can effectively explore the available self-development opportunities to equip themselves ahead of the future. These opportunities include workshops, trainings, webinars, library visits, and networking with colleagues.
- Re-training of lecturers in library schools: There is a link between the quality of the teacher and that of the student produced in any educational institution. In the same vein, the quality of lecturers in library schools and the level of their skills in ICTs will naturally reflect on their students. It is thus imperative that lecturers in the various library schools should take up short courses to obtain the requisite skills for next generation library and information services.

- Development of infrastructural facilities: Infrastructural facilities like power supply, telecommunication facilities, bandwidth and computers should be provided to enable librarians to offer effective services to users.
- Specialisation in LIS schools: The era of all-round librarianship should give way to specialisation. It is high time librarians defined their areas of specialisation. In this way, library and information professionals of the next generation will be well grounded in their areas of interest or specialty. In other words, to promote efficiency and high level productivity in the future information environment, there is need for specialisation.

Conclusion

The next generation library and information science practitioners must be adequately repositioned in terms of new skills and competencies. To remain relevant in the information parlance, possession of new skills and competencies is inevitable. If library and information professionals must remain relevant and occupy their positions as the main information service providers, the infusing of new skills and competencies into the professional practices is a necessity.

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A Review of Knowledge Management Education and Training in Kenya

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Abstract

Knowledge management has emerged as a discipline in the recent past. In spite of its growing popularity, confusion still exists on what the discipline is really about and whether it is actually distinct. This confusion extends to the nature and scope of competencies knowledge management practitioners are expected to have. The lack of information on the availability and content of knowledge management education and training programmes partly contributes to this confusion. There is need, therefore, to understand the extent to which knowledge management training needs are met in Kenya. The objectives of the study on which this chapter is based were to review the content of knowledge management education and training programmes and curricula in Kenya; the methodologies used to deliver the curricula; and their effectiveness in developing the essential competencies knowledge management specialists require. Primary data was collected through content analysis of academic and professional knowledge management education and training curricula deployed by organisations in Kenya. Additional data was collected from the trainers and graduates of the knowledge management courses through interviews. More data was collected from professional human resource recruitment consultants through key informant interviews. The findings of the study indicate that access to knowledge management education and training programmes in Kenya has increased in the past five to seven years. However, there are gaps in the scope, depth and delivery of the programmes. There is need to review the programmes to cover all the core skill areas besides using delivery models which build hands-on skills. Such interventions would enhance the potential of the courses in meeting the knowledge management capacity needs in Kenya. These findings may be used by training institutions to improve their curricula content and delivery methods. The findings may also be used by recruitment firms as well as employers to develop appropriate job descriptions for knowledge management specialists in Kenya.

Keywords: *Knowledge management, curriculum, education, training, Kenya*

Introduction

Many definitions and perspectives of knowledge management exist. Kwanya *et al.* (2015) define knowledge management as the multifaceted mix of strategies, techniques and tools which organisations, groups or individuals utilise to generate optimum value from their intellectual assets. Beijerse (1999) explains that the essence of knowledge management is to achieve organisational goals through strategy-driven motivation and facilitation of workers to develop, enhance and use their capability to interpret data and information by using available sources of information, experience, skills, culture, and character. Thus, organisational knowledge management involves identifying, capturing, structuring, leveraging and sharing an organisation's intellectual assets to enhance its performance and competitiveness. Brooking (1999) further argues that knowledge management is not only a collaborative and multidisciplinary process; it is also human-centred. It is no wonder that Gery (1991) explains that knowledge management uses a "surprising mix of strategies" such as storytelling, peer-to-peer mentoring and techno-based knowledge systems, among others. Ruggles and Holtshouse (1999) further explain that the key attributes of knowledge management include generating new knowledge; accessing valuable knowledge from outside sources; using accessible knowledge in decision making; embedding knowledge in processes, products and services; representing knowledge in documents, databases and software; facilitating knowledge growth through culture and incentives; transferring existing knowledge into other parts of the organisation and measuring the value of knowledge assets and/or the impact of knowledge management.

Organisations can use effective knowledge management to enhance their efficiency, continuity and market position. They can also use the principles of knowledge management to respond appropriately and promptly to emerging customer needs and wants; identify and mitigate risks; streamline operations; encourage innovation and creativity; enhance team collaboration and coordination; improve change management and adaptation; avoid resource wastage and duplication; as well as improve key competencies through effective knowledge creation and transfer (Mosoti & Masheka, 2010; North & Hornung, 2003). Organisations achieve these benefits by creating, growing and perpetuating knowledge assets such as ideas, information, memory, technical knowhow, image and reputation, business processes and techniques, as well as intellectual and commercial property rights (Abrahamson & Goodman-Delahunty, 2014; Gold, Malhotra & Segars, 2001; Mosoti & Masheka, 2010). In spite of its potential benefits, many organisations, especially in Africa, have not embraced knowledge management adequately. This is because of organisational challenges such as inadequate infrastructure, meagre financial resources, unsupportive political goodwill, incompetent human resources, and derisory policy frameworks, among other factors (Mbhalati, 2014; Ondari-Okemwa, 2004).

Education Versus Training

The terms education and training are often used interchangeably. This is inaccurate because they are not synonyms. Although they may overlap in various perspectives, they are still distinct in many others. Welch (2014) argues that training is short-term and aimed to give the learners skills to perform specific tasks. Education, on the other hand, is long-term and builds the capacity of the learners to perform a wide variety of tasks. He further explains that training focuses on “how to do” while education includes an understanding of theories and other concepts not directly or necessarily linked to a particular “doing”. Therefore, in training more time is used to practise and refine the skill being imparted while in education more time is spent on learning about the subject of study. It is also important to note that training uses course outlines while education is based on detailed curricula.

In the context of this chapter, training is offered to improve the practice of knowledge management. Training courses are short and used to address specific practice or competency areas and not the whole spectrum of skills in knowledge management. Therefore training is a performance-based undertaking in which success is judged by the ability “to do”. Education, on the other hand, is scientific in nature and covers several related concepts. The focus of education programmes is to build the capacity of learners to understand knowledge management concepts. Education is an academic undertaking whose success is determined by the ability of the learners “to understand”. Knowledge management, as a professional practice and academic discipline, requires both types of capacity building approaches to mature. There is need for people who understand the theory, models and other fundamental principles of knowledge management to do the “thinking”. There is also a greater need for people with the practical skills to apply the concepts. Therefore, training and education constitute the two sides of the knowledge management capacity building coin which are permanently joined and must remain so.

Rationale of Study

Societies can benefit from effective knowledge management by building human and organisational capacity in the area. Unfortunately, academic literature on knowledge management education is scanty. Perhaps, this is because knowledge management is still in its academic infancy stages (Dalkir, 2011; Despres, 2011). The situation seems not to be any different even in developed countries. For instance, Bedford (2013) conducted a study in the

United States of America which revealed that while knowledge management has progressed as a discipline in terms of curricula, it is still wanting in terms of research, faculty credentials, programme administration and programme goals. In Africa, Ondari-Okemwa and Minishi-Majanja (2007) conducted a study which revealed that the majority of Library and Information Science departments in South Africa had offered courses in knowledge management for the past ten years or so at the time of their study. They also found that already one university was offering a complete degree programme in knowledge management at the time. The study also concluded that the number and content of courses offered by these departments on knowledge management were diverse and varied. Therefore, they suggested that the scope of the courses should be deepened to include more topics. Overall, they concluded that there is need to strengthen knowledge management offerings within library and information science education going forward. This study, however, did not investigate the suitability of the courses in meeting the job market needs at the time.

Evidence from the literature reviewed indicates that there is no study which has specifically investigated the status of knowledge management education and training in Kenya. Nonetheless, a study by Kwanya *et al.* (2015) on knowledge management jobs in the country identified skills necessary for knowledge managers and emphasised the need for suitable education programmes to build capacity in these areas. Thus far, no empirical study has analysed the effectiveness of the existing knowledge management education and training programmes in meeting the skill needs in the job market in Kenya. As the country gears towards achieving a knowledge economy status by 2030, it risks missing this target due to a lack of suitable capacity building programmes in knowledge management locally. One way of mitigating this risk is by ascertaining the status and effectiveness of current knowledge management education and training programmes in the country. The current study sought to bridge this gap by investigating the availability of knowledge management education and training programmes in Kenya; the content of the professional and academic curricula deployed in the country; the pedagogical methods used to deliver the curricula; as well as the overall effectiveness of the content and delivery methods currently employed in knowledge management education and training in Kenya.

Methodology

The study, leading to this chapter, was designed as an exploratory survey. This is a methodological research approach used to investigate emerging research problems which have not been clearly defined (Saunders *et al.*, 2007). The cardinal purpose of exploratory research is to gain familiarity with a phenomenon or acquire new insight into it without necessarily making conclusions about it (Brown, 2006). Stebbins (2001) argues that exploratory researchers utilise discovery and serendipity to explore and gain valuable insight into the research problems. The author found this approach appropriate for the study because knowledge management is an emerging concept globally and more so in Kenya. The research design was also considered appropriate because of the limited literature on the topic of study.

The population of study was all universities and other institutions offering academic and professional capacity building programmes in knowledge management. Nineteen universities offering undergraduate and postgraduate programmes in knowledge management were identified from the Kenya Universities and Colleges Central Placement Service (KUCCPS) online database. The author accessed and analysed curricula of 11 programmes. Similarly, the author analysed course outlines of seven (7) companies offering professional training in knowledge management. Data were collected from these organisations through content analysis of their curricula or course outlines. Additional data were collected through key informant interviews with six (6) academic leaders (chairpersons) of the university departments offering the knowledge management courses; three (3) lead facilitators of the professional knowledge management courses; ten (10) graduates of the academic and professional programmes; as well as three (3) professional human resource recruitment consultants. The selection of the academic leaders and lead facilitators was based on their availability and willingness to participate in the study. The graduates of the programmes were identified through information-oriented purposive sampling with the help of either the chairpersons or lead facilitators. The human resource recruitment consultants were also selected purposively from the Institute of Human Resource Management database. Separate interview guides were used for each category of respondents. The collected data were analysed using descriptive statistics because it enabled the author to summarise, interpret and describe the data within the context of the study. Table 1 summarises the details of the respondents.

Table 1: Details of the respondents

Category	Number	Selection	Data collection technique
Undergraduate and postgraduate academic curricula	11	KUCCPS database	Content analysis
Knowledge management outlines of courses offered by professional training firms	7	Census	Content analysis
Academic leaders	6	Information-oriented purposive sampling	Key informant interviews
Lead facilitators of professional training firms	3	Information-oriented purposive sampling	Key informant interviews
Human resource recruitment consultants	3	Information-oriented purposive sampling	Key informant interviews
Graduates from knowledge management programmes	10	Information-oriented purposive sampling	Key informant interviews

Findings and Discussion

The findings indicate that knowledge management is steadily emerging as an academic discipline and professional practice in Kenya. However, each of the respondents had a different perspective of what it entails or the skills needed to succeed in it. This clearly indicates that knowledge management is yet to mature as an academic discipline or profession in Kenya. It also demonstrated the need for extensive research and capacity development to enhance the professionalisation of knowledge management in the country. The detailed findings are presented and discussed hereunder.

Availability of knowledge management education and training in Kenya

Five public universities have substantial knowledge management programmes in Kenya. These are The Technical University of Kenya which has Knowledge Management as one of the specialisations in its ongoing Bachelor of Science in Information Sciences programme. The university has also launched Master of Science in Information and Knowledge Management

programme in September 2016. Jomo Kenyatta University of Agriculture and Technology also runs a Master of Science in Information and Knowledge Management programme while Kisii University as well as Egerton University offer courses leading to Master of Knowledge Management. Masinde Muliro University of Science and Technology as well as the University of Kabianga have also launched Bachelor of Science in Information Science and Knowledge Management programmes. These programmes were introduced between 2011 and 2016. The fact that there are specific academic programmes on knowledge management in Kenya demonstrates the market need for professionals in the area.

Several other universities running library and/or information science programmes have also integrated knowledge management courses in their curricula. These universities include Maasai Mara, Meru University of Science and Technology, Laikipia, Karatina, Garissa University College, Rongo University, Kenyatta, Moi, Chuka, University of Nairobi, Kenya Methodist University, Mount Kenya University and Catholic University of Eastern Africa. The integrated courses are generally introductory in nature. They include fundamentals of knowledge management, knowledge taxonomy, introduction to knowledge management, and knowledge organisation (classification and cataloguing). This integration was also done around 2011 when the programmes were either reviewed or launched. These courses are generally considered to be inadequate in terms of content and delivery.

The author also found seven (7) consultancy firms offering short courses in various aspects of knowledge management in Kenya. The firms include Knowledge Management International, Regional Institute of Information and Knowledge Management, Kenya Institute of Management, Information Africa Organisation, Indepth Research Services, African eDevelopment Resource Centre, and Kenvision Techniks. The findings also revealed that a number of research institutions in Kenya also conduct specialised training in aspects of knowledge management for their staff and partners from time to time. The institutions included Kenya Forestry Research Institute (KEFRI) and Kenya Bureau of Standards (KEBS).

These findings indicate that courses on knowledge management have been available in Kenya through academic and professional training programmes for the past five or so years. Therefore, Kenyans are able to access relevant and affordable education and training on knowledge management locally. The findings also reveal that the history of knowledge management education in Kenya is quite short compared to other countries, even in sub-

Saharan Africa. For instance, Ondari-Okemwa and Minishi-Majanja (2007) in a study found that knowledge management programmes were introduced in South Africa in the early 2000s. Therefore, knowledge management as a practice and academic discipline in Kenya needs more time to develop and mature. Actually, only the first or second cohorts of students enrolled in the programmes have graduated thus far. These graduates are new in the job market and have not had an opportunity to impact the practice. It means that it will take a few more years before the knowledge management education and training programmes can have a meaningful impact in Kenya.

Courses offered

The academic courses offered at the undergraduate level include introduction to knowledge management, philosophy of knowledge management, knowledge management in organisations, knowledge economy, metadata management, knowledge taxonomy, expert knowledge systems, enterprise content management, ontology, and business information intelligence. These courses are offered alongside general education and core information science units including cataloguing, indexing, abstracting, classification, ICT applications, programming, web design and development, computer applications, networking and data communication, electronic records management, information preservation, conservation of information materials, communication skills and entrepreneurship education. The courses offered in the postgraduate programmes include indigenous knowledge management, e-learning, knowledge management theories, knowledge management processes, knowledge auditing and mapping, knowledge management strategies, organisational learning, knowledge seeking behaviour, bibliometrics, content curation and aggregation, and knowledge management systems. These postgraduate courses are also offered alongside research methods, entrepreneurship, project management, strategic management, organisational behaviour, social media and cloud computing, information literacy, and emerging issues in information and knowledge management.

The courses offered by the professional training firms include fundamentals of knowledge management, knowledge services, conducting knowledge audits, building knowledge culture, identifying knowledge needs, knowledge leadership, knowledge management strategies, knowledge management models, implementing knowledge management in organisations, knowledge management maturity model, knowledge management systems, knowledge economy, knowledge management processes, knowledge management

frameworks and standards, knowledge governance, knowledge transfer, e-learning, organisational learning, and tacit knowledge management. Most of the courses took three to five days and targeted participants from diverse backgrounds; not necessarily people with a background of or currently performing tasks in knowledge management.

These findings indicate that there is a wide variety of courses offered by different programmes in terms of scope and depth. These courses, if delivered effectively, are adequate to build essential skills in knowledge management. There is no standard of what should be in the various levels of academic and professional programmes. Similarly, there is no standard in terms of the number of knowledge management courses a programme requires to be credible. There is need for concerted efforts by the institutions and other stakeholders to determine the number and nature of courses which knowledge management programmes should offer. Given that most of the programmes were launched recently and have not been reviewed, this matter should be one of the major issues that the reviewers should consider. There is also a need to align the courses more closely to the Kenyan context.

Delivery of knowledge management course content

An analysis of the course content delivery methods revealed that all the universities used lectures, tutorials, group discussions and seminars (for postgraduate programmes). The examination of the courses was 30% continuous assessment and 70% written exam for the undergraduate programmes and 40-60 for the postgraduate programmes. All the professional courses were delivered through lectures (presentations) and group work. These findings indicate that most of the courses were theoretical in nature and were delivered using the traditional modes. Similarly, it was observed that the courses were delivered onsite. This implies that the learners needed to be physically present in the lecture sites to interact with the trainers and the other students. Three issues emerge from these findings: 1) there was less focus on the practical elements of knowledge management thus the graduates are likely to lack hands-on skills; 2) there was no flexibility in the way the courses were delivered in terms of making it possible for learners to take them without having to be present in a brick and mortar space; and 3) the role of the trainer was more prominent than that of the learner. These issues bring doubts about the effectiveness of the courses in building adequate capacity in knowledge management in Kenya.

A mix of part-time and full-time lecturers delivered the courses. The majority of the lecturers were originally trained in either information science or information and communication technology. Although, many of them had not been trained specifically in knowledge management, they were applying skills obtained from the relevant courses in information sciences or information and communication technology. The researcher observed that the use of part-time lecturers provided the advantage of fusing industry experience into the courses. However, it also brought with it demerits associated with lesser commitment and availability to work with the learners outside the scheduled lecture hours.

The researcher recommends that academic departments offering courses on knowledge management should integrate more practical sessions to build the capacity of the graduates to fit into their new roles easily and competently. The use of part-time staff, especially from the industry should be encouraged as a means of tapping into their field experience. However, there should be structured processes of identifying, selecting and assigning part-time staff. The departments are also encouraged to explore the possibility of using open and distance learning models where appropriate to expand the reach of the courses. This could benefit learners who are stationed outside the major urban centres. The use of visiting or guest lecturers, especially from institutions which have a history of offering knowledge management courses, is also encouraged as a means of benchmarking the courses with the best practice elsewhere.

Job market needs for knowledge managers

The recruitment consultants explained that the job market for knowledge managers has been small but is growing rapidly. They explained that part of the reason the market for knowledge managers in Kenya is still small is because the practice is new in the country. Similarly, many employers still do not understand what it is all about. This confusion is exemplified by the wide variety of job descriptions and titles associated with the profession. They explained that they expected the market to grow steadily as more institutions become better aware of the role of knowledge management in enhancing organisational performance. Asked to identify the skills most institutions expected knowledge managers to have, they explained that the skills varied between organisations. However, there was consensus that the skills spanned information technology, information organisation, communication skills, research, monitoring and evaluation, creativity and innovation, business product development, marketing, report writing, web publishing, content creation and management, statistics and data management, as well as leadership and principles of management.

Gaps in knowledge management education and training in Kenya

Asked to point out the gaps in the training of knowledge managers in Kenya, the recruitment consultants and the graduates of the programmes concurred that the greatest challenge is lack of hands-on orientation. They explained that the graduates required further training to get the essential skills to perform their roles. The consultants also explained that soft (human) skills are also lacking in most graduates. This is because the training programmes have focused more on the technical and technology skills. They suggested that there should be a balance of these skill areas to ensure that the graduates are able to fit into their new roles with least additional training. Another area where most of the graduates scored low is the capacity to align knowledge management to organisational strategic plans. The consultants observed that some graduates have the right technical and technological skills but no idea how to use these to align knowledge management tasks to the organisational mission and vision. Lack of alignment of the courses to the Kenyan context was another gap identified by the consultants. They explained that however competent the graduates are in other areas, they would not be useful if they are unable to fit these in the Kenyan context.

Recommendations

The respondents suggested a closer fit of the courses to the Kenyan context; a regular review of the programmes to include new trends in content; the adoption of open and distance learning model of training; use of guest lecturers to enrich the perspectives of the programmes; and inclusion of modules on soft skills. They also suggested that knowledge management courses should cover: 1) knowledge management theories, models, principles and myths; 2) knowledge management systems; 3) knowledge management processes; 4) knowledge management technologies; 5) organisational learning; 6) knowledge architecture; 7) applications of knowledge management in society; 8) knowledge leadership and championship; 9) strategic management; 10) community and partnerships; 11) indigenous knowledge management; 12) knowledge impact analysis and reporting; 13) advocacy, networking and alliance building; 14) intellectual asset management; and 15) legal and ethical issues in knowledge management. Therefore all substantive training programmes should include these.

Conclusion

The findings of the study indicate that access to knowledge management training in Kenya has increased in the past five to seven years. However, there are gaps in the scope, depth and delivery of the programmes. There is need to review the programmes to include the core skill areas which are currently not included as well as using delivery models which build hands-on skills. Such interventions would enhance the potential of the courses in meeting the knowledge management capacity needs in Kenya.

Practical Application

The findings of this study may be used by organisations offering knowledge management education and training services to review and/or design programmes which meet the needs of the job market more closely. The findings may also be used by relevant government agencies to develop policy on training needs for knowledge management. The same may also be used by human resource experts to develop job descriptions and requirements for knowledge management specialists in Kenya. Academic researchers may also use the findings for scholarly work on knowledge management education and training in Kenya and beyond.

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Section Seven: Role and Impact of Information and Knowledge Centres

The Application of Altmetrics in Assessing the Scholarly Impact of the Content of Digital Repositories in Kenya

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Abstract

Academic libraries are expected to measure the scholarly performance and impact of their users. In this regard, they ought to use relevant tools to assess the impact of scholarly work deposited in their repositories. Traditionally, research impact has been assessed using different citation metrics. However, these parameters have their limitations that make them incomprehensive. Altmetrics is an alternative mechanism that facilitates the tracking of researchers' scholarly performance beyond citation metrics. According to the Directory of Open Access repositories (OPENDOAR), 2016, Kenya has a total of 22 registered repositories. The content of these repositories need to be made visible and accessible as a means of enhancing usability. This chapter evaluates the application of altmetrics as a measure of scholarly impact. Specifically, it investigates the citation tools Kenyan libraries use, the benefits achieved by utilising altmetrics tools, and the challenges encountered in embracing altmetrics tools. The authors employed an exploratory survey methodology. Data were collected from the members of the Kenya Library and Information Consortium (KLISC) using online questionnaires hosted on Survey Monkey. Additional information was collected through documentary analysis. The findings indicate that there is low usage of altmetrics in Kenya; altmetrics can be an effective tool in measuring the impact of local content in digital repositories; and low level of awareness of altmetrics hinders the uptake of the tools. These results may be useful to universities and researchers in Kenya wishing to make their research widely visible and usable by integrating altmetrics tools in digital repositories. The potential impact of research in contributing towards the advancement of knowledge and solution of societal problems may be increased by embracing altmetrics to enhance their visibility and use. Any institution that needs to track down its scholarly impact may benefit from this chapter.

Keywords: *Altmetrics, impact factor, social media, bibliometrics, citation metrics, Kenya, academic libraries*

Introduction

Metrics is a standard of measuring impact to determine value. Universities are institutions which are expected to contribute to the society through building of specific capacities that respond to the human resource requirements in their communities as well as through research which can be applied in dealing with myriad challenges. As a means of assessing the performance of these roles, they need to assess their impact. In research, impact can be measured using diverse metrics. One approach is the measurement of the citation of published materials. According to Bornmann (2014), some of the metrics which can be used to measure citation impact include:

Impact factor (IF)

Impact factor calculates the number of times an average article in a journal has been cited in a given year and not the impact of individual articles. This metric is irrelevant in a repository context as most of the materials in the repository are unpublished. This metrics has also been criticised because it does not cater for the social aspects of research. Most research in Kenya, specifically journals, is subjected to impact assessment.

Citation analysis

Citation analysis involves assessing the number of times an article has been mentioned or referred to by other researchers. This information can be extracted from databases such as Web of Science, Scopus and Google Scholar. This tool is used in Kenyan research because some of the local content is found in these databases.

H-index

H-index quantifies a scholar's research impact. It is measured based on the author's most cited research. Databases like Web of Science and Google Scholar provide such information.

Altmetrics

With the emergence of Web 2.0 and social media, altmetrics has emerged as an alternative set of metrics. Altmetrics or alternative metrics aims to assess Web-driven scholarly interactions, for instance, how research is tweeted, blogged about or bookmarked (Howard, 2012). These definitions indicate that altmetrics offers an alternative to impact factor.

Understanding Altmetrics

Currently, there is no clear way of how research impact from other areas apart from science should be measured. Bibliometrics and peer review methods have been known for measuring impact in science yet there are no known methods of measuring societal impact. Consequently, altmetrics has been identified as an option for measuring social impact of research. Until recently, it had been assumed that society can only benefit from research conducted at a very high level. However, this notion has since changed as research is evaluated in terms of its benefits to the relevant society (Bornmann, 2013). Altmetrics consolidates data from sources such as social media, traditional media and online reference managers. Thus, the tool provides another way of calculating impact contrary to a journal impact factor.

There are various altmetrics tools available such as altmetrics.com, Public Library of Science Article Level Metrics (PLOS ALMS), ImpactStory.org, Plum Analytics and Paper Critics among others. The tools show statistics of articles viewed, downloaded, cited, saved or discussed (Finbar, 2013). However, there are those who hold the view that altmetrics acts as a complementary rather than an alternative to citations. Altmetrics has also been criticised widely and in some cases suggestions have been made that it should be replaced with the term influmetrics (Haustein, Lariviere, Thelwall, Amyyot & Peters, 2014).

How does altmetrics work?

According to Das and Mishra (2014), the Altmetric Bookmarklet or badge is a tool that can be included on the Internet browser to capture the attention the research paper is receiving. It can be installed on Chrome, Firefox or Safari and placed on the toolbar. The tool can show the online shares and mentions on the article in just one click. The badge is simple to install. One only needs to identify and contact the tool provider for this. The process includes dragging the "Altmetric it!" button into the toolbar. An academic publisher can then embed the altmetric score in each scholarly article published. A repository manager can also do the same. This can be shared through the social media platforms. Figure 1 shows the information obtained when the badge is embedded on the journal or repository. The author is able to know how many people have tweeted, blogged, downloaded or cited a scholarly work.

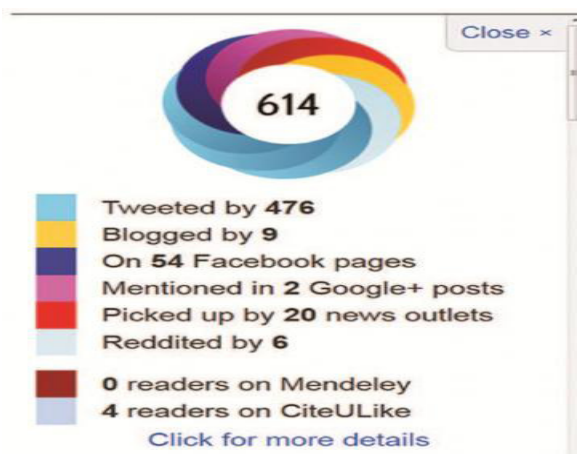


Figure1: Sample of an Almetric badge

Source: Das & Mishra (2014).

Adoption of metrics tools in Kenya

The adoption of open access and social media tools in Kenyan universities has contributed towards the need to use metric tools. Currently, scholars are making use of various online platforms such as Mendeley, ResearchGate, LinkedIn and academia.edu to promote their research and enhance collaborations. Researchers are using the tools to track attention to their research immediately; find out comments about their research to help them improve; and to showcase their research to funders. Researchers are able to get immediate feedback on their research even before any citation data becomes available.

The establishment of repositories has contributed towards the adoption of statistics modules such as the Content Analysis and Statistics module. The modules provide data on the uptake of the researcher's scholarly works available in open access platforms. Currently over 25 institutions have already established repositories using DSpace software. The new versions of this software have Open Researcher and Contributor ID (ORCID) integration facility that enhances the visibility of repository content and the researcher. Besides, DSpace's new versions have enhanced Google Scholar metadata. The facility provides various metadata about the article to be indexed and connects metadata with citation fields thus enhancing the impact factor of content. Nonetheless, the tools embedded in DSpace are not adequate to measure societal impact which repositories are developed to address,

hence the need for alternative metrics, the altmetrics. Repositories running DSpace can display altmetrics at the item-level to integrate the social media platforms.

What benefits do altmetrics offer?

Bornmann (2014) identified four benefits that altmetrics has compared to the traditional metrics. The benefits include the following:

- Diversified analysis of research resulting from varied audiences. This enhances research visibility.
- When it comes to traditional citation counts, results are available two years or more after publication contrary to altmetrics where impact measure of the research takes a shorter period after publication. For instance, a study conducted by Eysenbach (2011) indicated that tweets can predict highly cited articles within the first 3 days of publication. In contrast, the h-index is calculated only at the end of the year.
- In the current “publish or perish” culture, academics are expected to publish impactful articles at an unprecedented speed. This means that waiting for citations for months is a real delay especially for early-career researchers still seeking to establish themselves in their fields.
- Altmetrics captures a wider audience compared to traditional citations. Many scholars have begun to turn to altmetrics to showcase their research as it goes beyond measuring the impact of journals but also the journal articles. Altmetrics is also applicable to non-traditional research content such as data-sets and blog posts. Research funding organisations require researchers to demonstrate their societal impact by reaching the intended target groups of the research.

Altmetrics is associated with open access publishing. Globally, there is a big focus on open access and especially across institutions of higher learning. PLOS has associated open access with altmetrics, having been the first to use the tool to measure impact at the article level. Funders, publishers and even researchers are progressively adopting open access policies. It is therefore, important to look for appropriate ways to encourage them to deposit their research in open access through the institutional repositories. When they see that there is something to benefit from once they deposit, it becomes easier to sell the open access idea.

On the other hand, Henning and Gunn (2012) came up with the following altmetrics benefits for researchers.

1. Monitoring and tracking early attention is improved. This means the author can quickly be alerted of any misinterpretation or misuse of their research and have an opportunity to respond directly to the source. This gives the authors control to manage their professional reputation and online presence.
2. Authors are able to showcase their research using altmetrics. Authors are facing a stiff competition for funding and career development opportunities than ever before. The evaluation criteria range from government initiatives to funders and even internal review bodies. A broader picture of the impact of an author's work is crucial to telling the full story of the author's research and its benefits. Altmetrics may not tell the whole story but can provide an indicator for identifying where there is a story worth telling.
3. Altmetrics can be useful to early-career researchers as it can offer a record of the wider attention and engagement that their work has generated to influence public policy or product development.
4. As scholars embrace open access initiatives and the new publishing online outlets, the research is becoming broader and diverse. Altmetrics gives a wider view of research impact and influence by employing new methods of capturing and reporting online in addition to the traditional bibliometrics.

Challenges of altmetrics tools

The fact that altmetrics comprises different tools makes it hard to determine what each tool represents. There are different platforms which result in diverse indicators which again entail different user populations and motivations. The challenge of a clear common definition can be overcome if altmetrics are integrated into one metrics tool box. According to Thelwall *et al.* (2013), altmetrics is prone to gaming. It is easier to manipulate altmetrics than other traditional metrics. One can create numerous twitter accounts to frequently retweet their research or create fake blogs and websites that link to their own research in an effort to improve ranking in search engines. Family and friends can also influence the outcome of the ratings. Such a scenario puts the validity of the research into question, though it is argued that the number of people who are involved in the gaming is relatively small. Altmetrics tools providers

are working on systems to come up with safeguards that assign relative impact. It is also good to note that altmetric providers are keen on checking any signs of manipulation; this has reduced criticisms on altmetrics.

Rationale Of The Study

Universities and research institutions in Kenya which are members of KLISC have endeavoured to develop repositories to improve the visibility and impact of their local content. According to OPENDOAR, 22 institutions have their repositories on the Internet and several are at advanced stages of developing repositories. Unfortunately, they are unable to measure the impact of their local content on the society they serve. Published research use impact factor but the impact of unpublished research found in repositories requires a special tool to measure. Repositories therefore need to embrace the emerging online tools to assess the impact of local content. As Galloway and Rauh (2013) put it, the use of the Internet has enhanced the measurement of research impact.

Universities in Kenya use DSpace software to develop repositories. Several universities that have upgraded their DSpace to version 5.0 and above are now using content analysis statistical module already embedded in the software to measure impact. The tools are inadequate in measuring the impact of local content as they can only give general information on global perspectives and do not provide feedback or specific attention the content is receiving. There is need for a comprehensive method to measure the impact of repository content so as to ensure that the repository contributes towards scholarly and national development. Altmetrics is a possible alternative tool in measuring the impact of local content in repositories. This chapter addresses the question on whether university repositories that apply altmetrics tools are able to assess the impact of their repositories easily than those that do not embrace the concept. The research informing this chapter, evaluated the extent to which universities have applied altmetric tools to enhance the measurement of the impact of local research on repositories; metric tools used in Kenyan libraries to measure the impact of scholarly research; benefits of utilising altmetric tools to measure the impact of research content in repositories; and constraints libraries face when applying altmetric tools to measure the impact of research in university repositories.

Methodology

The authors employed an exploratory survey method. They adopted this method because altmetrics is a new concept in Kenya. Exploratory research is suitable for solving problems that have not been clearly defined. The research evaluated the application of altmetrics in university repositories to measure the scholarly impact of local research. The study targeted 100 KLISC members. Among the members, the 50 universities that are members of KLISC were sampled. A total of 35 (70%) universities responded to the questionnaire. Data were collected from the members of KLISC using online questionnaires hosted on Survey Monkey. The questionnaire had both open-ended and closed-ended questions.

Findings From Questionnaires

This section discusses analysis of the questionnaires as per the research objectives.

Response rate

Survey Monkey questionnaire link was distributed to KLISC members that comprises 50 universities. Out of the 50 universities, 35 responded to the questionnaire, giving an impressive response rate of 70%.

General information

The respondents were asked to indicate their profile to determine their ICT skills. All the 35 were in senior positions in the library. Their positions ranged from systems librarians, university librarians, deputy university librarians and senior ICT staff.

Application of metric tools to measure the impact of scholarly research on repositories

The respondents were asked to indicate if they have developed a digital repository. 19 of the 35 (63%) respondents indicated having developed a repository. Out of the 19 respondents, 14 (81%) of the repositories were accessible over the Internet. This was an indication that 19 repositories are in a position to embrace the use of altmetrics.

Metrics used to measure repository content

The respondents were asked to indicate the software used to develop repositories. Nineteen (100%) reported they use DSpace as the repository software. It was observed that 9 (50%) of the respondents have upgraded their DSpace to version 5.0 and above and indicated the use of analytics statistical module. The revised version has Google analytics embedded in the system to

measure usage. This implies that the institutions that have already upgraded DSpace use some metrics to measure impact of research on the repository.

Respondents were further asked to indicate the other tools they use to measure the performance of their repository content. Their responses are summarised in Figure 2 below.

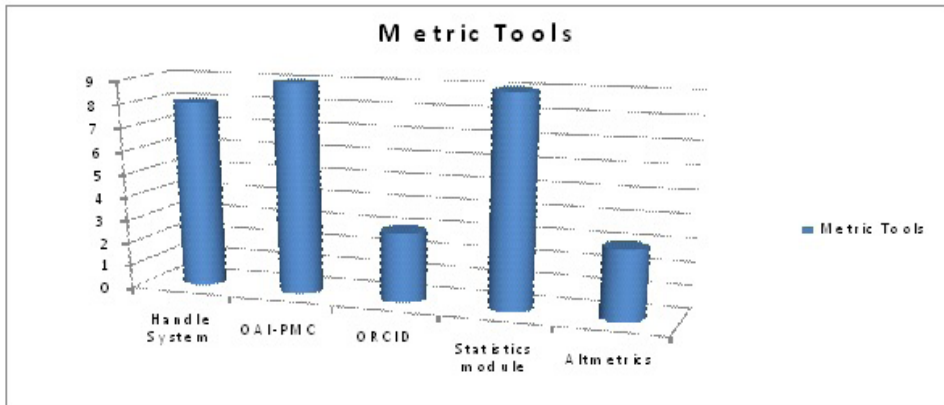


Figure 2: Metrics tools

Source: Research data

The five tools contribute towards enhancing the visibility of repository content and measuring impact. Out of the 35 respondents, 8 (23%) indicated that they were using OAI-PMH technology for harvesting content; and content analysis and statistics module. This implies that the two tools have been widely adopted as compared to the others. The handle system is second with 7 (20%) followed by ORCID with 4 (11%). The rest (9%) of the respondents expressed a low level of awareness of the altmetrics tools. The repositories that have embedded altmetrics tool into their repositories were able to get diverse feedback concerning their scholarly works. This revealed the need for sensitisation and advocacy. Universities are able to measure the impact of their local content towards economic and social development globally by embedding altmetrics into their repository content. The findings also revealed that 26% of universities are in the process of registering with altmetrics. This implies that there were some universities in Kenya using social media platforms to showcase research. Universities need to embrace the emerging trends in communication that can enhance the global visibility of research.

Benefits of altmetrics tools

The respondents were asked to state if they think applying altmetric tools in their repository to measure the impact of local research is important. Thirty five (100%) responded in the affirmative. They were further asked to give reasons as to why they would embrace altmetrics to measure the impact of their repositories. Table 1 summarises the findings.

Table 1: Need for Metrics tools (n=36)

Reasons for embracing altmetrics	Frequency	%
Allows research impact to be measured promptly	31	86
Gives an overview of the impact of research based on diverse audiences	28	80
Tracks the dissemination of research beyond academia	25	71
Provides prompt feedback from users of research	30	85
Can be applied effectively to grey literature and unpublished research found in repositories	31	86

Source: Research data

Almetrics collects data from various sources and also from the general public as compared to traditional citations which depended only on cited references in journals. This is an alternative tool that university repositories can apply to increase the citation impact of the repository content.

Challenges of altmetrics tools

The respondents were requested to indicate the problems hindering them from embracing altmetrics tools to measure the impact of local research in their repositories. The responses were indicated in the Table 2.

Table 2: Challenges in applying altmetrics (n=35)

Challenges in applying altmetrics	Frequency	%
Technical expertise to assist	28	80
Low level of awareness	32	91
No policy on impact measure tools	26	74
Inadequate staffing	29	82
Lack of institution support	18	51

Source: Research data

The findings reveal that most universities do not understand the concept of altmetrics in spite of their value. This indicates that scientific communities in developing countries and specifically in Kenya are still slow in adopting altmetric tools.

Conclusion and Recommendations

The use of altmetrics on digital repository content can make it possible for readers to see the attention that their research has generated from the media and social networks. Altmetrics is an option to measuring the impact of local content in repositories in Kenyan universities. The altmetrics tool can be embedded into research repository so as to boost access, visibility and availability of local scholarly works. Repository administrators should be sensitised on the benefits of altmetrics in enhancing the visibility of the content of their institutional repositories. Altmetrics advocacy should be actively spearheaded by altmetrics ambassadors and champions in universities.

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The Role of Academic Libraries in Webometrics Ranking of Universities in Kenya

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Abstract

Academic institutions now operate in highly competitive environments. Consequently, myriad mechanisms for rating the services and impact of universities have emerged as a means of influencing the choice of potential students, faculty and partners. Webometrics has emerged in the recent past as one of the most popular frameworks for measuring the impact of universities. This mechanism puts great emphasis on research productivity and dissemination. Academic libraries have developed and implemented strategies to enhance their ranking. The role and levels of involvement of academic libraries in these strategies is unclear. This study analysed the role of academic libraries in enhancing Webometrics ranking of their parent institutions. It also examined the degree to which libraries are currently involved in enhancing the Webometrics ranking of their institutions as well as how they can scale up their roles. This study was designed as an exploratory survey because webometrics is a relatively new concept. Primary data was collected through key informant interviews with academic librarians. The respondents were selected through information-oriented purposive sampling. Additional data was collected through literature review. The data was analysed using descriptive statistics. The study established that academic libraries in Kenya are, to a great extent, involved in webometrics strategies through the development of the institution's repositories, generation of web content as well as publishing and providing access to updated e-resources. This involvement is effective because it facilitates enhanced scholarly communication, resolute institutional web presence, collaboration and networking among institutions, and ultimately endorsement of the institutions' webometrics ranking. The involvement can be scaled up through effective ICT policies and infrastructure, continuous training, involvement in library consortia, and high quality content development. The findings of this study may be used by academic libraries to mainstream their role in enhancing the research productivity and impact of their institutions hence facilitating a favourable ranking.

Keywords: *Webometrics, academic libraries, Kenya, universities ranking, role of librarians*

Background of the Study

All over the world, libraries are dedicated to providing equitable access to information for all; be it in written, electronic or audiovisual forms (Emeka, 2014). Silvani, Sirilli and Tuzi (2010) assert that academic libraries play one of the most important roles by meeting the information needs amongst university communities through free access to information services, platforms and products. These tools build bridges between individuals locally and globally in knowledge creation and sharing. In industrialised countries, access to modern information technology is currently one of the most attractive academic library services (Dadzie, 2015). In most African countries, academic libraries share a common trait – they have established themselves as an integral part of a national education and information system (Ikechukwu, 2009). They offer access to information, are highly service-oriented, and constantly improve their services through co-operation and networking (Krolak, 2005). Academic libraries are hybrid libraries that offer traditional media, and in the recent times, have a strong focus on providing access to online information (Rabai, 2013). In Kenya, academic libraries are increasingly cooperating with other community organisations as well as engaging in diverse activities including social readings, creative writing classes, and orientation on information and communication technologies and the Internet (Odera, 2011).

One major area that libraries, especially academic libraries, are continuously making a significant contribution is in webometrics. The information science field of webometrics is defined by Bjerneborn and Ingwersen (2004) as the study of the quantitative aspects of the construction and use of information resources, structures and technologies on the web drawing on bibliometric and informetric approaches. More generally, it is perceived as the study of web-based content with primarily quantitative methods for social science research goals using techniques that are not specific to one field of study. The term *webometrics* was coined in 1997 by Tomas Almind and Peter Ingwersen in recognition of the fact that informetric analyses could be applied to the web (Almind & Ingwersen, 1997). Webometrics, therefore, is the quantitative analysis of web phenomena, drawing upon informetric methods, and typically addressing problems related to bibliometrics. Webometrics was triggered by the realisation that the web is an enormous document repository with many of these documents being academic-related (Silvani *et al.*, 2010).

The ranking of world universities, according to Aguillo, Ortega and Fernández (2008), is based on webometrics methods that consider the documentation published and made accessible via the Internet, specifically the size (page count) and impact (external in-links). In this way, all institutions at the

university level contribute content to the general performance of the university (measured through its official website). This contribution is quantified through webometrics. Webometric methods have been widely applied in Europe, and to a lesser extent in other continents such as Asia, Australia and Africa (Noh, 2012). Against this background, the current study examined the role of academic libraries in webometrics ranking of universities in Kenya.

Rationale of Study

Webometrics ranking of universities has gained popularity in the recent past in Kenya. Consequently, universities have put in place strategies to enhance better ranking each year. Most of the strategies currently used by universities in Kenya to enhance their ranking are anchored on the performance of ICT departments. The role of the academic library in this regard is unclear. Given that webometrics was originally developed to enhance the access of scientific knowledge through open access, academic libraries stand a better chance in supporting better ranking for their parent institutions. This is largely because academic libraries are the centres of scholarly work in universities and support the generation, collection, organisation and dissemination of scholarly work through myriad platforms of which open access publishing has become pivotal. Therefore, universities should involve academic libraries more in their efforts to get better webometrics ranking. This study makes a case for better involvement of academic libraries in institutional strategies to earn better ranking by demonstrating the potential role they can play.

The specific objectives of this study were to analyse the current levels of involvement of academic libraries in webometrics strategies of universities in Kenya; the effectiveness of this level of involvement; and rationale and strategies for scaling up this involvement. The authors also proposed a framework on how to involve academic libraries more effectively in institutional strategies to enhance webometrics ranking by universities in Kenya.

Theoretical Framework

The study leading to this chapter was anchored on the Information-Centered Research (ICR) theory. This theory is an e-research theory that focuses on a new information source by 1) developing generic research tools that can be applied across a number of problem areas; and 2) identifying relevant research problems. The ICR theory was developed by Thelwall and Wouters (2005). The ICR theory argues that information scientists should explore new web-based data sources in order to identify the disciplines in which they may be useful

and the methods that may be applied to extract data from them (Thelwall & Wouters, 2008). ICR approaches are currently applied by researchers as they contribute directly to knowledge in the form of publications or reports. They also deliver the information and associated processing techniques to appropriate knowledge domain experts who use the same for collaborative or solo research. ICR has been considerably criticised as an approach that roots for the delivery of data sources rather than dissemination of individual facts (Greenberg, 2009). The authors are of the view that an increasingly important strand of research within webometrics is the generation of metrics from the impact of academic articles using evidence from web searches for mentions of them. Thus, the Information-Centered Research theory is absolutely relevant to this study because it postulates that librarians should be pro-active information scientists on the web, directing researchers to useful tools and data sources which address their needs. This can directly boost institutional ranking based primarily on research and teaching-oriented data.

Literature Review

Webometrics is defined within the framework of informetric and bibliometric studies. Almind and Ingwersen (1997) identified the Web as an important source for measuring documents and information. After a short period, information scientists recognised that many powerful web measurements could be conducted using the new powerful advanced search features of the search engines. Historically, the development of webometrics is traced to the first half of the twentieth century from statistical studies of bibliographies and scientific journals. The term is associated with cybermetrics as a generic subfield (Holmberg, 2010).

Glanzel and Schubert (2005) observe that web presence measures the activity and visibility of institutions of higher learning and is a good indicator of impact and prestige of universities and colleges. The ranking summarises the global performance of the institutions, provides information for prospective students and scholars, and reflects the commitment to the dissemination of scientific knowledge. Currently, webometrics ranking of institutions of higher learning worldwide is published by the Cybermetrics Lab, a research group of the Spanish National Research Council (CSIC) located in Madrid. Webometrics ranking intends to motivate both institutions and scholars to have a greater web presence that reflects their activities accurately. According to Khan and Park (2011), if the web performance of an institution is below the expected position according to their academic excellence, university authorities should reconsider their web policy and promote substantial increases of the volume and quality of their electronic publications.

The original aim of webometrics ranking of world's universities was to promote web publication. Bar-Ilan (2005) indicates that open access initiatives, electronic access to scientific publications and the other academic material are the primary targets of webometric ranking of world's universities. Academic libraries, on the other hand, are entrusted with the generation of scientific publications (e-journals, repositories) and other scholarly resources. Due to this reason, Hertzal (2012) observes that the contribution of the academic library to the web performance of the corresponding university has been elevated. The contribution of academic libraries to webometrics ranking of universities is considered to be very high, due to the large amount of content stored on the library websites and repositories. The digitalisation of printed content and the creation of digital collections conform to a wide set of digital issues and plays a paramount role in the progression of webometrics ranking of institutions (Tolosa, 2010). Moreover, other units continue to emerge within academic library websites which are suitable for storing and making available large amounts of digital content, mainly online catalogues, digital collections and repositories and hence greatly contributing to better webometrics rating of the corresponding university (Mahmood & Richardson, 2012).

Methodology

The study which led to this chapter adopted an exploratory survey design because webometrics is a relatively new concept in Kenyan academic institutions. The exploratory survey design is a research design conducted about a research problem when there are few or no earlier studies to refer to. Exploratory survey design gathers preliminary information that helps define problems and suggest hypotheses. This design is applied when gaining insights and familiarity for later investigation or undertaken when problems are in a preliminary stage of investigation.

In this study, the target population included key staff members in academic libraries of five (5) selected public universities in Kenya. The selection of the five universities was based on recent webometrics rankings. In this respect, the authors picked the best two universities, two average ones, and the last one on the ranking. Based on the January 2016 webometrics ranking, the selected universities were the University of Nairobi, Kenyatta University, Dedan Kimathi University of Technology, Karatina University and Egerton University respectively. The respondents included the librarians working on the institutional repositories and ICT teams involved in webometrics. These respondents were selected through information-oriented purposive sampling. Using this technique, the authors subjectively picked respondents

who were acquainted with the concept of webometrics in a deliberate effort to gain pertinent information on the research issues. The use of information-oriented purposive sampling enabled the researchers to reach a targeted sample quickly. Further, it made it easier to get a sample of subjects with specific characteristics (Barton, 2001). The authors picked one librarian and one ICT specialist from each of the five universities; giving a total of ten respondents. The respondents were picked because they were deemed capable of providing pertinent information regarding the role of academic libraries in webometric ranking of universities in Kenya.

Primary data was collected through structured interviews using an interview schedule. A structured interview is a quantitative research approach commonly employed in survey research. The authors used the interview schedules as guides to ask the respondents a series of questions on the subject of the study. The data collected was analysed through descriptive statistics. Descriptive statistics were adopted for this study because they help describe, show or summarise data in a meaningful way. The outcomes of the qualitative data generated from open-ended questions in the interviews were analysed and categorised in themes in accordance with research objectives and was reported in a narrative form.

Findings and discussions

This section presents and discusses the findings of the study. The first section presents the response rate and background characteristics of the participating staff members. The rest of the sections are presented based on the research objectives.

Demographic information

The respondents consisted of librarians and ICT specialists of whom six (60%) were male while four (40%) were female. With regard to age, the majority of them (80%) were between 20 and 30 years old while two (20%) were between 31 and 40 years old. Pertaining to working experience, a majority of the library staff (60%) had a working experience of five years and above; 30% had three to four years of experience whereas one (10%) had one to two years of experience. These findings indicate that the majority of university staff involved with institutional repositories and other ICT related tasks are generally male and young individuals. These findings concur with the general perceptions that most of the male librarians are engaged in more technical than customer relations roles in libraries.

Current levels of involvement of academic libraries in webometrics strategies of universities in Kenya

To establish the level of involvement of librarians in webometrics strategies, the respondents were first asked to indicate the extent to which their university libraries were involved in webometrics practices. The majority (80%) of the respondents were of the view that their university libraries were involved in activities aimed at enhancing webometrics ranking to a great extent; the remainder (20%) indicated that their university libraries were involved to some extent. The respondents were further asked to specify the ways in which their university libraries were engaged in activities to enhance webometrics ranking. They stated that their libraries were involved by developing and updating the university's institutional repository (IR); publishing and providing access to current e-resources; and developing and publishing web content through the library web sites. These activities were aimed at increasing the volume and quality of web content related to the university. These contribute greatly to the size parameters of the webometric ranking criteria.

Effectiveness of current levels of involvement of academic libraries in webometrics strategies of universities in Kenya

The study was also interested in determining the effectiveness of the current levels of involvement of academic libraries in webometrics strategies of universities in Kenya. The respondents were first asked to indicate whether their libraries' engagement in webometrics was effective. All the ten respondents (100%) indicated that their libraries' engagement in webometrics was effective. The respondents were further asked to indicate the ways in which their libraries' engagement in webometrics was effective. They stated that the libraries were effective in enhancing webometrics ranking of their universities through enhanced scholarly communication by publishing in digital open repositories; development and provision of access to quality e-resources which endorse the universities' webometrics ranking; reinforcement of universities' web presence through increased web content; development of back-links to universities' domains; as well as promotion of collaboration and networking among universities to aid teaching and learning in the institutions. These findings indicate that academic libraries play an important role in generating and marketing content which enhances the web presence and impact of their institutions. The findings are in accord with the assertion by Hertzal (2012) that webometrics have been widely applied in academic libraries to facilitate storage of large amounts of electronic content such as scientific papers in repositories, digital collections, and a wide range of digital assets on library websites.

Rationale and strategies for scaling up involvement of academic libraries in webometrics strategies of universities in Kenya

The study further investigated the rationale and strategies for scaling up the involvement of academic libraries in webometrics strategies of universities in Kenya. In this effort, the respondents were first asked to point out whether academic libraries should be involved with webometrics or not. All the ten respondents (100%) indicated that academic libraries should indeed be involved in issues related to webometrics. The respondents were then asked to explain how academic libraries in Kenya can be effectively involved in webometrics. They explained that this could be done by implementing effective ICT policies; developing efficient web platforms like e-repositories so as to ensure active web visibility; building the competence of staff on open access scholarly communication; training key stakeholders on the benefits and impact of webometrics; developing and/or participating in library consortia such as the Kenya Library and Information Services Consortium (KLISC); developing high quality content; creating more web pages to improve the visibility of universities; uploading of diverse formats of web content; supporting academic staff to increase their web presence by creating accounts on platforms such as Google Scholar and ResearchGate; as well as upgrading systems to keep pace with the latest information technology trends. These findings are in agreement with the argument by Khan and Park (2011) that for the web performance of an institution to be at the expected position according to their academic excellence, university authorities should reconsider their web policy and promote substantial increases of the volume and quality of their electronic publications.

Conclusion

The study established that academic libraries in Kenya are, to a great extent, involved in webometrics strategies through the development of the institution's repositories, generation of web content, as well as publishing of and providing access to updated e-resources. This involvement is effective because it facilitates enhanced scholarly communication, increased institutional web presence, improved collaboration and networking among institutions, and ultimately better endorsement of the institutions' webometrics ranking. Nonetheless, this involvement should be scaled up by the libraries taking more roles in content creation, quality assessment, marketing and preservation.

Recommendations

This chapter recommends that academic librarians should lead the efforts by universities to enhance their webometrics ranking. This recommendation is based on the understanding that libraries manage the dissemination of organisational scientific research output through institutional repositories, self-archiving systems as well as other forms of scholarly communication including the publishing of journal articles. Besides, given their training, librarians have the capacity to assess and enhance the quality of scholarly content to make them more relevant to the information needs of their users. This can be achieved through diverse information repackaging approaches. The academic librarians should also lead the development of content creation, sharing and archiving policies which support effective dissemination of scientific output from the universities to their academic counterparts and the society at large. In this effort, the libraries can work with the departments of ICT as well as the corporate communications and marketing units in their universities.

Recognising the fact that most university web sites in Kenya are erratic due to infrastructural challenges, the researchers recommend that the university network administrators and ICT departments should make necessary arrangements to eliminate functional and infrastructural impediments by regularly updating their websites and ICT infrastructure to keep up with the current proliferation of Internet-based resources that are increasingly becoming freely available. Besides enhancing up-times of their web sites, these interventions would also increase the reach of the content on the web sites thus enhancing their impact.

Practical Implications of the Findings

The findings of this study may be used by academic libraries to mainstream their role in enhancing the research productivity and impact of their institutions hence facilitating a favourable ranking. The findings may also be used by academic institutions to develop appropriate job descriptions for academic librarians which go beyond the traditional roles by including tasks associated with webometrics. Academic institutions offering training in library and information science may also apply the findings to revise their curricula to integrate modules which build the skills of librarians to undertake webometric tasks competently.

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The Expectations of Community and Public Libraries in the Actualisation of Sustainable Development Goals (SDGs) in Developing Countries

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Abstract

The purpose of this chapter is to identify the various avenues through which community and public libraries can contribute towards the realisation of sustainable development goals. The chapter highlights the expectations of community and public libraries towards the attainment of sustainable rural development. The study from which this chapter arose used literature review to collect relevant data. The findings indicate that community and public libraries need to repackage and deliver information services relating to agriculture, health, education, business and entrepreneurship, legal issues and information consultancy. The libraries should also provide functional information literacy programmes, re-engineer library activities that promote a reading culture; and translate documents to the indigenous languages of the user communities. The findings also revealed that the libraries are likely to face challenges such as inadequate funding, lack of innovative and creative ideas amongst information professionals, unsupportive government policies, lack of the essential infrastructure, low level of awareness of partnership opportunities, shortage of highly innovative staff, deficiency of one-dimensional knowledge acquired in library schools, poor lobbying and advocacy skills amongst staff in community and public libraries, neglect of community and public libraries by governments. These findings may be used by governments and other agencies to enhance the realisation of sustainable development goals through effective information services by community and public libraries.

Keywords: *Community libraries, public libraries, sustainable development goals, developing countries*

Introduction

The peculiarity of the library as an institution is its ability to act as a provider of information. The library is the acknowledged custodian of knowledge since time immemorial. In spite of the challenges brought about by new technologies and information seeking behaviour, libraries still play an important role in the provision of information in communities. Access to information services and resources in the urban and rural areas is among the essential pillars of democracy (Nnadozie, Egwin & Ossai-Onah, 2010). Access to information is also an important catalyst of development in society (Ndinde & Kadodo, 2014). Library and information services enable the ordinary people in the rural or urban settings to engage in socioeconomic development effectively (Ebiwolate, 2010; Jimma, 2014). The public libraries, in particular, are acknowledged as the people's university because of their proximity to the ordinary people. They provide information services that are unique and closer to the people in community settings. Given that most developing countries rely on agriculture as their economic mainstay, meaningful development can only be realised through the effective engagement of rural communities in socioeconomic activities (Nnadozie, Egwin & Ossai-Onah, 2010; Ifukor, 2013). As Ifukor (2013) explains, a rural library is also needed so that information from the government and other agencies can reach the rural populace effectively. This is because a community-based library is fundamentally concerned with the provision of problem-solving information to the community dwellers (Agboola & Bolanle, 2013). Thus, community and public libraries play a significant role in social development by providing information, educational, and entertainment facilities in the society (Sharma, 2013). Kamba (2009) explains that sustainable community development is dependent upon the use of information. Harande (2009) as well as Agboola and Bolanle (2013) assert that one of the surest ways of raising the standard of living in the rural areas is the provision of useful and reliable information through library services. They add that any nation that disregards the development and empowerment of the rural communities should not expect meaningful development. Rural communities are best served by community and public libraries which offer contextualised services free of charge (Suttana, 2014). These institutions serve as the information dissemination points which aid the survival and growth of communities. They provide the information required by members of the community so as to make effective use of the available resources around them (Ndinde & Kadodo, 2014). The rural library provides a permanent house for all information bearing materials produced in the area or brought to it by government and non-governmental information agents (Ifukor, 2013).

Research Problem

It is guaranteed that community and public libraries have a great potential to contribute to the attainment of sustainable development goals in the communities they serve. However, many of them, especially in the developing countries, have not made meaningful contribution to socioeconomic development in their communities. One of the reasons for this poor performance is a lack of appreciation of what they can do. Similarly, many of the community and public libraries are neglected and lack the essential resources and goodwill to deliver their mandate. They need to re-engineer themselves by understanding the expectations of their users in terms of their role in socioeconomic development. They also need to develop appropriate strategies on how to overcome the challenges they face in their effort to deliver services expected of them. The purpose of this paper is to identify the various avenues through which community and public libraries can contribute towards the realisation of sustainable development goals.

Methodology

The study from which this chapter arose was conducted using literature review on the role of and expectations on community and public libraries; the potential role of community and public libraries in the realisation of sustainable development goals; the challenges the libraries are likely to face as they seek to offer effective services; as well as the strategies they can use to overcome the challenges so as to offer effective services which can have a positive impact on the realisation of sustainable development goals.

Findings and Discussions

The findings of this study are presented and discussed under the general themes of the literature review. These include the expectations of services from community and public libraries as well as the relevant action plans they can implement to achieve the expectations; the challenges community and public libraries face in their efforts to support socioeconomic development; and the actions they can take to enhance their effectiveness in supporting socioeconomic development in their communities.

Expectations of Community and Public Libraries in the Context of Sustainable Development Goals (SDGs)

Goal 1: End poverty in all its forms

The community and public libraries in developing countries are expected to identify key services that should be provided to the people who are living in poverty in an effort to help them out of poverty. The community and public libraries can do this by disseminating relevant information that bridges the gap between men and women and offers equal rights to economic resources. Also, the community and public libraries can provide the government with information on people living in poverty. In line with this, they are expected to carry out or support research to identify the actual ratio of men, women and children living in poverty in Nigeria.

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

With the world experiencing acute hunger as a result of food shortage, expectations are high for community and public libraries. People engaged in farming need agricultural information. Therefore, community and public libraries should play the vital role in improving productivity by providing this information in the most appropriate form and content. They need to partner with agricultural extension workers in this effort so as to enhance the relevance of the information provided.

Goal 3: Ensure healthy lives and promote well being for all at all ages

Health is wealth. Therefore, the greatest wealth a nation can have is a function of how healthy the citizenry is. Community and public libraries are expected to identify and meet the health information needs of their communities. The information can be about diseases such as HIV/AIDs, tuberculosis, cholera and malaria. They can also provide information on nutrition and dietetics, environmental conservation, and healthy living, among other issues. In this effort, they can partner with Rural Health Workers (RHW) and medical practitioners.

Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

To ensure the full realisation of this goal, community and public libraries are expected to identify the educational needs of communities as well as the barriers that hamper their realisation. They can then provide information resources to support learning at all levels. They can also assist the government to provide a viable platform for all learners to have access to sustainable

education and acquire knowledge. The libraries can also help create a reading culture through effective information literacy programmes.

Goals 5: Achieve gender equality to empower all women and girls

The community and public libraries can sensitise the communities about the needs of women and girls. They can also develop programmes and deliver services which empower women and girls through information. The libraries can also provide information on social, economic, physical or health challenges women in their communities face as a means of mainstreaming them in the development agenda. These services can be offered effectively through networks, alliances and partnerships with the relevant stakeholders.

Goal 6: Ensure availability and sustainable management of water and sanitation for all

People need access to information on the availability and sustainable management of water and sanitation. Community and public libraries in developing countries can play a significant role in actualising this goal by disseminating information that will help in the reduction and elimination of dumping of hazardous chemicals and materials in their immediate environment.

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

The librarians working in the community and public libraries can use appropriate channels to create awareness on the need to ensure universal access to affordable, reliable, and modern energy services. Community and public libraries in developing countries can also sensitise their users of the alternative sources of energy which have minimal effect on the environment.

Goal 8: Promote sustainable, inclusive and sustainable economic, growth, full and productive employment and decent work for all

Community and public libraries can contribute towards to the attainment of this goal by offering information services and products which empower the readers to create wealth, create job opportunities or develop skills necessary for employment. Some of the services may entail training on specific skills such as compiling winning business proposals; marketing of services and products; as well as networking and alliance building. The libraries can also provide space for use for entrepreneurship activities by their communities.

Goal 9: Build resilient infrastructure that promotes inclusive and sustainable industrialisation and foster innovation

In order to build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation, community and public libraries should disseminate information that support economic development and human well-being. Also, they are expected to provide information on the accessibility to financial services and affordable credit facilities. Community libraries should also create necessary infrastructure and facilities which their communities can use. These include physical facilities like conference rooms; ICT infrastructure and networks; and Internet connectivity.

Goal 10: Reduce inequality within and among countries

The community and public libraries are expected to provide government at the central and grassroots levels with information and strategies on how to achieve and sustain income growth at the bottom of the pyramid. Also, they could play a vital role in the identification of strategies on how to empower and promote the social, economic and political inclusion of all persons irrespective of age, sex, desirability, race, ethnicity, origin, religion, economic, or other status. Beyond this, they could provide information that promotes and facilitates orderly, safe, regular and responsible migration and mobility of people, including through implementation of planned and well-managed migration policies.

Challenges community and public libraries are likely to face in their efforts to contribute to the attainment of SDGs

The community and public libraries are likely to encounter the following challenges:

1. Low level of innovative and creative skills among librarians in public and community libraries;
2. Inconsistent or unsupportive government policies which affect the effective delivery and access of information services;
3. Poor lobbying and advocacy skills among library and information professionals leading to low visibility and impact;
4. Most community and public libraries are underfunded and neglected by the government and other agencies;

5. Lack of essential infrastructural and other facilities and technologies which restrict the access and use of information services and products in community and public libraries.
6. Action points to enhance the impact of community and public library in development

From the foregoing discussions, the community and public libraries should take the following actions to enhance their effectiveness in supporting the attainment of sustainable development goals in their communities:

1. Customise the services and products to the specific socioeconomic contexts of communities;
2. Understand and respond effectively to the information needs and priorities of the communities;
3. Increase access to and use of information services and products to all members of their user communities regardless of their physical, intellectual or economic differences;
4. Enhance lifelong education through effective information literacy programmes which create, nurture and sustain a reading culture;
5. Reduce the digital and other forms of divides which negatively affect the capacity of individuals or communities to participate effectively in socioeconomic development;
6. Build, sustain and effectively use networks, alliances and partnerships to the benefit of the user communities;
7. Identify, preserve, conserve and promote the use of indigenous knowledge which is easily accessible and usable in communities; and
8. Re-engineer their services and physical spaces to reduce or remove barriers to their access and use.

Conclusion

Community and public libraries have a great potential for supporting the realisation of sustainable development goals. However, they have not been able to play these roles effectively because of the myriad challenges they face which constrict the accessibility and usability of their services. They should re-engineer their services and products to enhance their relevance and applicability in socioeconomic activities.

Recommendations

The authors make the following recommendations from the study:

Orientation among librarians on the expectations of librarians in sustainable development goals (SDGs) framework

There is need for proper orientation and awareness among library and information professionals on the centrality of information in the global SDGs framework. It has been established that awareness promotes participation. Therefore, if library and information professionals are to be actively involved in the SDGs activities, there is need for adequate awareness among them on their expected roles.

Recruitment of qualified library personnel

To ensure that public libraries and the rural or community libraries perform creditably well in the SDGs agenda, it is imperative that adequate and qualified librarians are employed in the public library systems. The provision of the appropriate resources through the appropriate channel (medium) demands the employment of the right personnel who must be qualified library professionals, competent in rural information gathering and dissemination techniques.

Training

Kamba (2009) contends that in order to produce the right information that will adequately serve the rural communities in this digital age, there has to be rural information-oriented training especially on the current trends and the developments in information technology.

Re-designing of library science curriculum to include community services and social responsibility

The curriculum used in the training of information professionals in developing countries should be re-designed to include community services and social responsibility courses. In this way, the librarians-in-training would be equipped with the requisite skills necessary to function effectively in the provision of community and rural library services.

Provision of infrastructure and technologies

Capturing and preservation of some forms of indigenous knowledge requires the application of technologies. This implies that library and information professionals should ensure that the necessary technologies are available in the public and community libraries.

Building capacity on lobbying and advocacy

This would help to empower the information professionals with the relevant skills with which they create and use networks, alliances and partnerships to mobilise resources and other forms of support for their libraries.

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The Influence of Performance Contracting on the Operations and Services of The University of Nairobi Library

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Abstract

This chapter is a result of a study that analysed how performance contracting has influenced service delivery at the University of Nairobi library. It also proposes strategies to enhance the implementation of performance contracting as a measure of improving service delivery. The specific objectives of the said study were to assess the level of performance contracting integration in the University of Nairobi library service charter; determine the actualisation of performance contracting in the delivery of services; identify the challenges experienced in achieving the set service delivery-based performance contracting targets; and propose how performance contracting can be fully implemented to enhance service delivery at the University of Nairobi library. This research was guided by the expectancy theory. Descriptive survey research design based on a single unit case study of University of Nairobi library was adopted. Primary data was collected through interviews with 40 members of staff of the University of Nairobi library selected through purposive sampling. Additional data was collected through documentary review. The collected data was analysed both descriptively for qualitative data and thematically for quantitative data, and presented in terms of frequencies, percentages, direct excerpts and descriptive narrations. The findings of this study may enable academic libraries, and more so University of Nairobi library, to create synergy between delivery of services and performance measure tools that they have adopted.

Keywords: *Performance contracting, academic libraries, library services, library operations, University of Nairobi library*

Introduction

Since the early 1990s, the Government of Kenya has been greatly committed to public sector reforms resulting in the emphasis on enhancing standards of service delivery within its agencies. This led to the government introducing measures that focus on improvement of the quality of the services it provides. These measures include performance contracting; management by objectives; international standards organisation; stretch targets; benchmarking; high-performance work practices; systems thinking; as well as strategic planning, amongst others. Despite these efforts, dominance of input and process

performance indicators that fail to meet the citizens' expectations still abound. As a result, citizens have found it difficult to relate to the results of performance evaluations. Previous analysis of the University of Nairobi library customer surveys feedback and staff appraisal have shown varied levels of customer dissatisfaction with the services received.

In Kenya performance contracting has been established within the framework of the state corporation regulations of 2004. The act legally binds all public institutions to adopt the concept of performance contracting. The Government of Kenya and the University of Nairobi (UoN) management are the main stakeholders responsible for supporting the library budget thus they have a higher expectation of quality service to the library patrons of any affiliating faculties and departments that includes but not limited to University of Nairobi library system and other information centers. The measure of the service delivery or performance in most public institutions of higher learning and in their respective departments is done using performance contracting as one among other tools of measure. The University of Nairobi library being an integral unit within the University of Nairobi is expected to negotiate a performance contract with the university's management. The top down approach of agreeing and cascading the deliverables of performance contract is adapted from the parent Ministry of Education, Science and Technology. Balogun (2003) explains that the emphasis on performance contracting for the delivery of results is undoubtedly influenced by the basic assumption of performance contracting which lies in its professed ability to unite the attention of institution members on a common objective and galvanise them towards the attainment of this objective. Thus, the study sought to ascertain the influence of services offered on the basis of the unity of objectives of University of Nairobi library performance contract.

The foundation of performance contracting in the University of Nairobi library is its service charter. The charter has established quality objectives that guide the delivery of services to the patrons and stakeholders. This puts into perspective these objectives with a view of establishing how they have been used to influence services and operations of the University of Nairobi library. The library's services charter (2016) outlines the following objectives:

1. To put a system in place that will ensure that library users have access to relevant information at an appropriate time so as to support teaching, learning, research and consultancy programmes;
2. To develop systems for the preservation and conservation of valuable and rare information resources for posterity;

3. To increase and update library facilities for improved information delivery;
4. To put measures in place to promote a proactive, transparent and accountable management system;
5. To ensure provision of secure, clean and conducive environment for library resources, users and staff; and
6. To strengthen and increase collaboration and partnerships at national, regional and international levels.

These objectives are the basis of dependable variables that measure the performance of the library. This study sought to ascertain how performance contracting has influenced the fulfilment of the objectives of the library's service charter.

Performance Contracting

Performance contracting is a branch of management control systems and a part of strategic management. It is defined as an agreement binding two or more parties to performing, or refrains from performing some stipulated act(s) over a specified period of time. Kobia (2006) places performance contract elements at the core of new public management approach that aims to unburden management from cumbersome rules and regulation which hinder quick decision making thereby relieving a manager of a public sector institution from unnecessary dilemmas of deciding the best approach of operation and service package delivery to be employed. Obong'o (2009) defines performance contracts or agreements as specific standards of performance or quantifiable targets which a government requires public officials or the management of public agencies or ministries to meet over a stated period of time. The unifying purpose of performance contracting are to assist staff to clarify and contextualise objectives of services in organisations; establish and harness the existing relationship with government; as well as to facilitate performance evaluation that is based on results rather than conformity with existing bureaucratic rules and regulations. A performance contract encapsulates a range of management instruments that purposely define responsibilities and expectations between parties with the main intention and focus being the achievement of mutually agreed results. It is a vital tool for articulating clear definitions of objectives and supports innovation in the management, monitoring and control methodologies while at the same time imparting managerial and operational independence to public service managers. It is

therefore a tool of management for facilitating accountability and transparency for results by public officials, as it measures achieved targeted results as set in the preceding agreement.

Rationale of the Study

The public service plays a critical role in the effective delivery of services that facilitate the functioning of a country's economy. When the delivery of services is constrained or becomes ineffective, it affects the quality of life and a country's development process. The implementation of reforms and performance contracting has been implemented in Kenya since 2004. The process of strategic planning has been actualised in a largely incongruous context with little emphasis of linkages that focuses to a common and integrated vision. Inadequate clarification of departmental or sectorial standards has resulted in sectors and departments concentrating on inputs, process and output indicators which do not link performance to outcomes. There have been concerns from stakeholders, including the general public, about the government services delivery, and the inconsistency between perceived performance of various government agencies and their performance ratings. In some sectors, the programme has contributed significantly to improve administrative and financial performance, while in others the results are yet to be realised. The lack of universal acceptability was one of the reasons various institutions began implementing the programme at different times. Most institutions registered their first participation in 2005/2006. Obong'o (2009) argues that despite the achievements attributed to performance contracts (like better evaluation of performance, improved service delivery, adoption of competitive strategy in the delivery of public service, among others) resistance, has made the programme to perform poorly. Although performance contracting guidelines are well spelt out, a number of challenges have been experienced as depicted by a SWOT analysis reported. The threats to performance contracting included institutional culture of managing without any set targets; lack of transparency; resources which are assumed to be available in good time but are actually not; loss of faith by the public on the system especially when it continually does not respond to public expectations; the ranking process has been questioned on the basis of validity and usefulness in performance evaluation and also whether it truly reflects the relative performance of ministries.

Academic libraries face the pressure to improve service delivery as well as become more accountable, customer-focused and responsive to stakeholder needs. It is unclear whether the introduction of performance contracting

in these information centres has improved service deliver. Several studies on performance contracts have been carried out. A survey on performance contracting in Kenya found that 44% of the respondents did not have a work plan, 79.6 % had not received any training on performance contracts, while 26.4% said their ministries had not signed the 2006/7 performance contracts with the government (Kobia & Mohammed, 2006). Previous studies conducted on performance contracting have concentrated on challenges of implementation (Opiyo, 2006). No known study has been done in Kenya on the impact of performance contracting on information centres and more so academic libraries. This study responded to previous calls in literature to use qualitative research methods to generalise findings from previous studies. The study empirically tested the impact of performance contracts on service delivery by academic libraries. This area has attracted scarce research attention. The study sought to ascertain the impact of performance contracts on the quality and quantity of service delivery in the University of Nairobi library system. The specific objectives of the study were to: establish whether the University of Nairobi library services have been impacted by performance contracting; assess the impact of performance contracting skills development and performance monitoring and evaluation on service delivery; identify the challenges of performance contracting on service delivery by the University of Nairobi library; and propose strategies of overcoming the challenges faced in the implementation of performance contracts by the University of Nairobi library.

Theoretical Framework

The research employed the expectancy theory that was developed by David Nadler and Edward Lawler who base the theory on Victor Vroom's formula: $Motivation = expectancy \times instrumentality \times valence$ (Vroom, 1964).

Achua and Lussier (2010) posit that the expectancy theory is attained when people believe that they can accomplish a task when they are motivated; and for every worthy effort, there is equal reward. The assumption of the theory is founded on the understanding that both internal (needs) and external (environment) factors affect behaviour. According to Sloof and Praag (2005), behaviour is the individual decision; people have different needs, desires, and goals; and people make behaviour decisions based on their perception of the outcome. Performance-outcome concerns a person's expectation that his remuneration is closely tied to his level of performance. For example, in a library any employee who has an intention of doubling his or her output may

expect that doubling the output will result in praise, more pay or perhaps no reward at all; the employee may even expect hostility from the other employees. Robbins and Judge (2007) explain that expectancy theory argues that the strength of a tendency to act in a certain way depends on the strength of an expectation that the act will be followed by an outcome and on the attractiveness of that outcome to the individual. In the library, expectancy theory is applied to explain the expectations of librarians that their good performance will attract commensurate rewards.

Methodology

Descriptive survey research design based on a single unit case study of University of Nairobi library was adopted for this study. Primary data was collected through interviews with 40 employees of the University of Nairobi library from all cadres in its organisational chart. The participants were selected through a purposive sampling approach to provide maximum variations of responses. The cadres in the library's organisational chart have been divided into two; the senior staff and junior staff. The collected data was analysed both descriptively for qualitative data and thematically for quantitative data, and presented in terms of frequencies, percentages, graphs, direct excerpts and descriptive narrations.

Findings and Discussions

All the 40 sampled members of staff provided their responses. This 100% response was achieved because the researcher approached the potential respondents and personally invited them to participate in the study.

The majority (60%) of the respondents were female. This is in agreement with the general perception that there are more female than male librarians. However gender distribution did not affect the variation of responses with regard to performance contracting. The respondents agreed that there is no direct correlation between gender and general work performance in the library.

Implementation of performance contract to enhance service delivery at University of Nairobi library

The findings (see Table 1) revealed that every employee working at the

University of Nairobi library has to set targets and agree to deliverer the results at the end of every financial year. Each financial year has four quarters and targets are distributed within the range of this period. Individual targets are accumulated to make a collective target of a section, department, college or campus library ultimately cumulating to the aggregate total that the library management has to deliver within the stipulated financial year. The findings also revealed that the frequency of revising the targets set to meet the objectives of performance contracting is fairly high. However, the research does not reveal if the revision is upward to increase productivity or downwards to reduce expectation and hinder performance. From the result, there is a sequential significant increase of staff working under performance contracts in the last few years. This is because of the emphasis by the university on embracing performance contracting in all its departments to realise maximum benefit.

Table 1: Implementation of performance contracts

S/N	ITEMS	OPTIONS	FREQ.	%
1.	Have you signed performance agreement with the University of Nairobi library	Yes	40	100%
		No	0	--
2.	How often do you revise and revisit your targets	Very Often	9	22.5%
		Often	22	55.0%
		Rarely	9	22.5
		Never	0	--
3.	For how long have you worked under the performance contract	Below 1year	13	32.5%
		1 - 2 years	16	40.0%
		3 - 4 years	7	17.5%
		Above 4 years	4	10.0%

Source: Research data

Challenges experienced in achieving the set service delivery-based performance contracting targets

The results of the analysis are presented in Table 2.

Table 2: The challenges experienced in achieving the set service delivery-based performance contracting targets

S/N	Items	Options	Frequency	Percentage
1.	Lack of motivation	Agree	16	40%
		Disagree	24	60%
2.	Workload and work plan	Agree	27	67.5%
		Disagree	13	32.5%
3.	Complexity in understanding the concept of performance contract (lack of comprehension)	Agree	33	82.5%
		Disagree	7	17.5%
4.	Evaluation	Agree	11	27.5%
		Disagree	29	72.5%
5.	Limited time	Agree	24	40%
		Disagree	16	60%
6.	Facilitation	Agree	32	80%
		Disagree	8	20%
7.	Institutional weakness	Agree	14	35%
		Disagree	26	65%
8.	Human resources	Agree	28	70%
		Disagree	12	30%
9.	Bureaucracy	Agree	22	55%
		Disagree	18	45%
10.	Inhibits performance by setting targets	Agree	29	82.5%
		Disagree	11	27.5%

From Table 2, it is observed that there is a general endorsement by the respondents that the challenge of understanding the concept of performance contacting and cascading the targets by relating to the mission and vision of the library is a basic problem encountered in the process of implementing performance contracts. Another challenge was inhibition of individual performance because they are confined to work with the set targets of the performance contact thereby hindering creativity and innovation as a target set does not compel library staff to think “outside the box”. The other challenges included the inability of staff to attain and actualise the set target within the

workload and work plan matrices because they lacked the required capacities, skills, knowledge, experience, qualification and competences; in spite of the mandatory requirement for implementing performance contracting in all the departments within the university, the staff lacked motivation; feeling of bias in performance evaluation; the time for implementation was limited leading to disjointed or discontinuation of programmes and projects; institutional weaknesses in effectively supporting or funding the budget activities necessary to achieve the set targets; as well as the inability to provide supporting resources and materials to facilitate successful implementation of the performance contract in an efficient, effective or timely manner.

How can performance contracting be actualised and implemented fully to enhance service delivery at University of Nairobi library

From the findings presented in Table 3, the University of Nairobi library needs to come up with a conceptual approach that will focus on understanding the factors that inhibit the complete actualisation and realisation of measurable and sustainable results of the performance contracting process. This may be achieved through capacity building programmes that impact competences, skills, knowledge and experiences to develop a workforce that fully appreciates the importance of achieving the set targets. Again there is an urgent need to establish congruence of working objectives of the performance contracts. Teams should work in pursuit of unifying objectives that relate to the vision and mission of the library through a coordinated effort that creates balances between individual, group and the library interests. Remuneration and equity in rewarding employees by adequately compensating individual and group efforts may also result in better performance. The respondents were of the view that a fair disciplined work culture, if sustained, may result in better services as well as create a propitious environment for innovation and creativity that speedily delivers desired results.

Table 3: Strategies to actualise full implementation of performance contracts

S/N	Items	Options	Frequency	Percentage
1.	Capacity building	Agree	33	82.5%
		Disagree	7	17.5%
2.	Unity of command and direction	Agree	32	80%
		Disagree	8	20%
3.	Remuneration	Agree	14	35%
		Disagree	26	65%
4.	Team Spirit	Agree	28	70%
		Disagree	12	30%
5.	Discipline	Agree	22	55%
		Disagree	18	45%
6.	Order	Agree	29	82.5%
		Disagree	11	27.5%

Conclusion

The author concludes that if performance contacting or any other management tool is pursued only from a strategy angle, the effect is likely to be an emphasis on the wrong issues. From the findings, the University of Nairobi library has clarity of goals. However, the majority of its staff cannot relate to the various matrices and attributes of performance contacting. They are also unable to relate to other action control standards that are geared towards ensuring that the elements of a given tool of performance measure have been actualised successfully. The lack of this comprehension leads to a loss of direction in realising enhanced service delivery and a positive impact. These findings concur with Wafula (2013) who concluded that defining performance helps many public sector organisations to ask the right/appropriate questions and achieve what they have defined. For libraries to be able to improve and shift towards operational effectiveness, they need to focus on well-articulated procedures that define outcomes that its workforce can relate to. Redefining approaches to the aforementioned challenges may establish a clear path towards realising the goals of most management systems with emphasis being on customer satisfaction and results accountability.

Implication of the Findings

The findings of this study may facilitate academic libraries, and more so University of Nairobi library, to create synergy between delivery of services and performance measurement tools that they adopt as well as provide a foundation for employment of relevant interventions that enhance service delivery. The findings may further have a direct benefit for university libraries and other related service providers in identifying and addressing issues associated with formulation and implementation of performance contracting and other action control tools of measure. The study findings may also help to create awareness and advocacy for the need for employing performance contracting in improving service delivery in libraries and related information services centres. The findings may also be used as a foundation for further research on various aspects of the new management tools introduced in libraries to improve service delivery.

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Section Eight: Legal and Ethical Issues in Information and Knowledge Management

Copyright Implications of Providing Information through Open Access in University Libraries in Africa

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Abstract

This chapter examines the legal implications of providing copyrighted information through the concept of open access by university libraries on the African continent. Although information is an important resource, access to it is limited in Africa. Abject poverty means a number of countries are more pre-occupied with basic survival to care about investing in information. The existing libraries are hopelessly under-resourced prompting library and academic staff as well as students to resort to reproducing the limited information resources at their disposal. In so doing, the university fraternity has met enormous resistance from rights holders for infringing on their copyright. The purpose of this chapter is to highlight the challenges that librarians working in universities in Africa undergo when providing information using open access. Specifically it: examines the kind of environment that libraries in Africa operate; provides an overview of copyright law and in particular, copyright exceptions and limitations; explains open access concept; explains how copyright affects provision of information through open access; and shows the way forward for librarians on the continent. The methodology used is document analysis based on extensive literature review; the author's extensive experience in researching and teaching the vast area of intellectual property; and interview sessions with copyright holders and librarians in their official capacity as information providers. It was found that although open access and in particular, institutional repositories are a welcome development, there are likely to be copyright and other challenges that librarians may need to overcome before their services are felt. Among these are the ignorance of the law by information providers and depositors. To overcome this hurdle, librarians must for all intents and purposes, be legally literate. As long as they remain legally illiterate, copyright owners will always take advantage of their ignorance.

Keywords: *Open access, institutional digital repository, university libraries, Africa, copyright*

Introduction

Although information is a basic requirement, it has not been accorded any serious recognition in many states in Africa. Many countries on the continent are still struggling to meet the basics of life among them, food, shelter, diseases, and security. Information is considered a luxury (Otiike, 1993). In support of this view, Mchombu (1980) observes that the common man is poor, illiterate and concerned with basics of survival. More than four-fifths of his income is spent on food alone. Ideally libraries exist to provide information to the people in need. The information provided should be relevant, current, exhaustive, timely and accurate. Unfortunately, this has not been the case in Africa. The performance of most libraries has been seriously affected by underfunding. Although decision makers claim to appreciate the importance of information in fostering national development and libraries in disseminating information, it is lip service. Libraries still remain marginalised when it comes to funding.

In Kenya, the problem has seriously affected provision of information in university libraries. Sirali (1997) observed that public university libraries that were once centres of academic excellence, had been threatened with collapse. Although university libraries are entitled to budgets amounting to five percent of the total university budget, this has never been the case. While the student enrolment continues to rise, the budget continues to diminish.

In an attempt to maximise the use of the limited information resources, libraries have had to resort to practices which have not pleased the publishers or information creators, namely:

- Reproduction of documents
- Inter-library lending
- Reproducing course packs

In Kenya, Mwita (1999) observed that university libraries have been a major culprit in reproduction of copyrighted documents. He states that in 1997 alone, a total of 140,000 books were photocopied in universities in the country. He observed that universities and students no longer buy books. He argues that inter-library lending discourages young libraries from being self-sufficient. In a study carried out by Ayamunda and Nwabachili (2015) in Kenya, evidence was found of widespread copying in universities in the country. Poverty and spiralling costs of books was blamed for the practice.

Every time a library tries to reproduce a book or document, publishers are quick to invoke copyright law. They argue that reproducing a book without permission from the right holder or creator is illegal and therefore, amounts to copyright infringement punishable in a court of law. Unfortunately, the same right holder does not tell the librarian what good things copyright law has for the library and information user. For instance, they do not tell librarians about the doctrine of fair use where libraries and users can reproduce copyrighted materials for non-commercial purposes without seeking consent of the rights holders.

Copyright Law

Copyright is a legal right that authors, publishers and other producers of creative works have to protect their work from being reproduced without their consent (Otike, 2012). The law allows copyright owner exclusive rights over his/her work. In so doing, it gives copyright owner monopoly to enjoy the proceeds of his/her effort for a period of time. This facilitates creativity and innovation. Duration of copyright varies from one country to another. In many countries in Africa, it is 50 years after the death of the author while in the UK and US, it is 70 years. Where a copyright owner is not able to handle issuing out of reproduction licence, the work can be entrusted to an agent normally a reprographic rights organisation (RRO).

Copyright Exceptions and Limitations

Copyright law in many countries, provides exceptions for certain uses of copyrighted works. This is in line with international conventions and in particular, the Berne Convention. These exemptions are known in the UK and most Commonwealth states as “fair dealing” while in the US, they are referred to as “fair use” (Otike, 2011). According to the fair use doctrine, reproduction of copyrighted works should be done in such a way that it does not economically or monetarily disadvantage the copyright owner.

Reproduction of copyrighted works is strictly confined to the following purposes:

- Private use
- Scientific research
- Criticism or review
- Reporting of current events subject to acknowledgement of the source
- Use of works by government or court of law

- Use of works by libraries
- Reproduction of work for class room instruction or educational purposes
- Reproduction of work into Braille for use by the visually challenged

The Berne Copyright Convention requires that signatory states provide for Exceptions and Limitations in their copyright legislations. It also requires member states to ensure that the Exceptions and Limitations meet the three conditions stipulated in the Treaty often referred to as the “Three Step Test” (Otike, 2012). The Convention requires reproduction to be done:

- In certain special cases
- Provided such reproduction does not conflict with the normal exploitation of the work
- And does not unreasonably prejudice the legitimate interest of the author

In the US, the American copyright law stipulates four conditions, namely:

- The purpose and character of the use
- The nature of copyrighted work
- The nature and substantiality of the portion used in relation to copyrighted work
- The effect of the use on the potential market

In Africa, Uganda has one of the most user friendly copyright legislations while Kenya has perhaps the most extreme one. Uganda has very generous provisions for libraries and educational institutions including reproduction of materials to assist the visually challenged members of the society. The Kenyan law on the other hand, is mean on teaching and related activities.

Importance of Exceptions and Limitations

The above are important because:

1. Without them, information users including among others, writers, authors, and researchers would be compelled to obtain written permission any time they cite or refer to a work from authors or publishers who not be easy to locate.
2. Authors and publishers would be flooded with too many requests which they may not be able to cope.
3. They enable information to be disseminated to a wider audience through controlled reproduction and inter-library lending.
4. Both writers and publishers stand to benefit from exemptions in their official capacity as consumers or users of information.
5. Without exemptions, authors and writers would be equally handicapped.
6. They discourage censorship. Without exemptions, censorship would be the order of the day. Copyright owners would restrict dissemination of certain information.
7. Librarians' work would be hampered because of restriction on dissemination of information and resource sharing.
8. Exceptions and limitations strike a balance between the interests of the authors (or copyright owners; and the interests of users and the public at large. Exceptions recognise the users' right to access information
9. The creation of new works would be impeded
10. Exceptions increase the use of information resources and support research needs of users and enhances education. It is particularly useful to libraries in developing countries where countries are seeking to widen access to tertiary and higher education through e-learning
11. Libraries globally spend enormous amount of money purchasing published materials and subscribing to electronic information databases from the meagre funds available. Libraries have for long played an intermediary role between publishers and information users. In this regard, exceptions appear to be the only way libraries can realise their objective of providing information support to the growing population on minimal budgets.

Library Exceptions

In western countries such as the US and the United Kingdom, national copyright laws allow:

1. Library patrons to use the library's photocopier or other copy machines to reproduce limited amount of copyrighted works
2. Making copyrighted works available on the library computer.
3. Making copies for library patrons. Users, particularly those in special libraries, often request library staff to reproduce copyrighted works for personal or official use. Field staff often opt to reproduce the work rather than borrow the materials from the library for outside use.
4. Making digital copies for preservation and replacement. In some countries, libraries are permitted to reproduce copies for preservation and replacing lost copies.
5. Creating course packs for students. In some countries, librarians may be requested to produce "course packs" comprising journal articles, chapters from books, etc to be distributed to students.
6. Reproducing the materials in Braille for use by the visually challenged. Some countries allow reproduction of copyrighted works for use by the blind. This is however still a debatable issue. Many publishers are still opposed to this issue. A general treaty on this subject is yet to be signed. Library associations and stakeholders have been pressurising WIPO to come up with one.
7. Inter-library loans. Some national laws allow libraries to lend out copyrighted materials on inter-library loan basis. This may include reproducing journal articles and chapters from books.
8. Copying for other libraries. In some countries, a library can copy a work in the library's collection for another library which has requested it for inclusion in its collection or enable it to supply it to its user for research or study.
9. Copying to replace stolen, lost or damaged materials. A library can reproduce a copy to replace a library copy which has been lost, stolen, or damaged in the course of use.
10. Acquiring by copying a material that is either out of stock or out of print from another source to stock its collection.

Copyright Infringement

Copyright infringement is the act of breaking copyright law. Copyright is infringed if an individual or organisation reproduces a copyrighted work without obtaining authority or licence from the copyright owner. Copyright is also infringed if one goes against the laid down requirements of the law (Otiike, 2011).

Copyright infringement varies from one country to another depending on national laws. In Kenya, copyright is infringed when an individual is found with more than one infringing copy. Although it is not explicitly stated, this means that being in possession of one infringing copy is not a copyright crime in Kenya. Perhaps the reason for this is to make allowance for materials reproduced under copyright exceptions and limitations. Copyright exceptions rarely allow for reproduction of multiple copies of the same work.

Creative Commons Licensing

Creative Commons (CC) is a non-profit organisation founded by Lawrence Lessigs and his colleagues in Mountain View, California in the US in 2001 (Berkman Cente for Internet and Society, 2012). The organisation has released a number of copyright licences known as Creative Commons Licences free of charge to the public. The licences allow creators to communicate the rights they reserve (those rights that they restrict) and the rights they can allow (or waive) for the benefit of recipients or other creators. Creative commons licences are not meant to replace copyright but simply compliment it. They replace individual negotiations for specific rights between the copyright owner in his capacity as the licensor and the licensee.

The organisation has established major categories of licences from which copyright owners can pick from. Depending on need, these can be subdivided further.

Attribution (BY): The author here allows others to use his work on condition that they give credit to the work. Attribution is accorded to all creative works.

Non-Commercial (NC): In this category, the author allows others to use his work but for non-commercial purposes only. This however does not mean that the work cannot be used for commercial purposes. Where it has to be, a separate licence must be opened by users to use it for commercial purposes.

Non-Derivative (ND): Authors may allow others to copy, distribute, display, and perform only verbatim copies of the work, but not derivative works based on it. The right to make adaptations can be licensed under a separate arrangement.

Share Alike (SA): In this category, authors allow others to make derivatives from the original work but can distribute derivative copies only under the same terms as the licence of the original work.

The Effect of Copyright on Open Access

According to the Budapest Open Access Initiative (2001), Open Access is the free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself.

Open access has two major components: open access publishing; and open access institutional repositories. This chapter has confined itself to institutional digital repositories. An institutional digital repository is an online archive established by a university or research institution in which its members deposit their information materials for unrestricted access and use.

Although open access is a fantastic arrangement, one that should be supported by the academic and research fraternity all over, there are some copyright considerations that need to be addressed. One is the issue of reprints arising from articles published in the journals. Although authors who happen to be academics and researchers, may wish to deposit their copies in the institutional repository, they may not own copyright to the work. At the same time, the publishers may not support the idea of depositing the reprints because it could deny the journal of business. Commercial publishers consider institutional repositories as their rivals. This issue is also noted by Christian (2008) in a similar study carried out in Nigeria. In addition, they may be worried that their work could fall prey to plagiarism and may insist that only the abstracts should be digitised for circulation while the main work remains in printed format. Restricting circulation of the work beats the very purpose of open access.

To make open access effective, a number of universities or institutions require their staff and students to compulsorily deposit materials they produce such as theses, conference papers, research reports, etc. While this is certainly a good

idea, it is likely to have legal consequences. Some theses, dissertations and papers could have been produced by staff while undertaking programmes in other universities that may also wish to claim copyright ownership to the work. Some conference sponsors may wish to publish the papers in their proceedings.

Another issue relates to materials that are confidential or sensitive in nature. Such materials may pose a serious legal problem if they are put on open access outright. A proper mechanism will need to be put in place to take care of this kind of information. In Kenya, the law requires classified records to be kept out of circulation for at least 30 years from the time it is produced. Going against this requirement is criminal.

Another important source of information for repositories is the research findings. However, Some research findings may be patentable. In this regard, both the researcher and host faculty may not support the idea of depositing the materials. Exposing patentable documents to a wider public could jeopardise the patenting of the findings.

In instances where staff, researchers and students are required to deposit their materials, there will still be a need for the creators to retain depository right. This right allows the depositor to recall the material wherever need arises. Such a policy if put in place, could affect the comprehensiveness of resources in the repository.

The librarian is also likely to receive materials in print form. The materials have to be converted into digital form to be accessed electronically. Non-copyrighted materials do not pose any problem. The problem arises with copyrighted materials. In instances where the depositor does not own the copyright despite the fact he/she could have authored the work, the copyright holder must be consulted by the depositor and a written consent obtained. Failure to do this could land the librarian and the university into problems in court of law. Publishers are concerned about digitising their materials. They argue that digitisation affects their business.

Measures to Overcome Legal Obstacles

Among the strategies that information professionals need to adopt to address the above challenges is to be knowledgeable on issues relating to the law. For quite a while information professionals all over the world and in particular, Africa have held the view that law is the domain of lawyers (Otiye, 1996). This is not true. In support of this view, Aguirre (2010) argues that in the Philippines, as elsewhere, apprehensions about intellectual property laws stem largely from a lack of understanding of how they work. As result, librarians tend to swing towards either of the two extremes: towards a strict interpretation and implementation of the rules, thus hampering service; or

towards complete disregard of them, bordering on irresponsibility that can open them to charges of copyright violation, or abetting violation of the law by their clients. In a study carried out in Kenya, Otike (2012) found that a local Reproduction Rights Organisation (RRO) took advantage of library staff's ignorance of copyright law to collect reproduction fee threatening them with dire legal consequences if they did not comply.

In addition, information professionals should be involved in reviewing the law in their respective countries. Their participation is important in that it takes care of the interests of libraries and information users. Without the participation of information professionals, the Act is likely to be biased in favour of copyright holders.

To ensure that information professionals are averse on issues of the law, it is important that teaching of basics of law should be carried out in Library and Information Science (LIS) schools on the continent. Dermont (2012) observes that the library fraternity can no longer afford to consider intellectual property law as a foreign topic appropriate for law schools. Already a number of LIS schools in English speaking countries in Africa have been conducting the programme. A number of LIS schools in Kenya, South Africa, Nigeria and Ghana have been teaching the course. At Moi University in Kenya, Makerere in Uganda and University of Zambia, for instance, the courses have strong component of copyright.

It is also important that depositors and users should be enlightened on issues relating to copyright. The fact that information is freely available should not make users to abuse it by excessive reproduction and plagiarising the content. As noted earlier, one of the reasons rights holders are uncomfortable with open access repositories is the fear that their work could be plagiarised. In support of this view, John-Okeke (2008) observes that understanding copyright issues is a key to building a successful institutional repository. She observes that in order to develop repositories, institutions collect materials from faculty staff, students and researchers. In so doing, they are likely to encounter some copyright issues. The depositors must obtain consent from copyright owners before the materials are deposited otherwise they could be accused for infringing copyright. In addition, depositors need to be knowledgeable about Creative Commons Licensing. The most appropriate for most depositors would be the Creative Commons Attribution licence. This simply requires the copyright owner to be acknowledged whenever the work is used for non-commercial purposes or private use. Depositors need to be educated on the importance of digital repositories.

- In view of the above discussion, there is need for libraries to develop institutional repository policy. The policy will specify:
- Who should deposit the materials

- What materials should be deposited and the conditions they can be accessed
- When the materials should be deposited

In addition, the policy will assist to:

- Ensure depositors understand the motive of the repository and their legal rights over the materials
- Inform the patrons how to use the repository taking into account any legal obligations.

The policy will also advise the university to come up with appropriate policies to compel staff, students and researchers to deposit copies of their research work and academic papers, theses and dissertations with the repository. The policy should accord the librarian total freedom in the management of the repository. It should allow the librarian to decide who uses the resources and how it should be used. The librarian should develop appropriate strategies to encourage the university fraternity to deposit materials and at the same time, patronise the repository.

- The policy should not allow the following materials to be deposited:
- Materials prohibited or censored by the government.
- Materials that are defamatory in nature. Holding such materials could have legal consequences to the library and the university as a whole.
- Materials that have the potential or earmarked to be patented at a later time. Information on these materials needs to be obtained from the depositors well in advance.
- Materials whose owner has no copyright ownership even if he/she is the author of the material unless there is evidence to show the copyright owner has cleared him/her to deposit the material.
- Materials deposited must have relationship with the parent institution.

The Medical Library Association (2007) advises information professionals to ensure that their digital repositories:

- Include copyright notice on all digital copies of materials
- Educate users and train staff about copyright implications

- Help users understand why they usually cannot distribute multiple copyrighted materials to other individuals and groups
- Comply with terms of electronic licence agreements, which can be different from what is allowed under copyright law
- Negotiate licence agreements that support the needs of users and the institution
- Identify the designated institutional agent to receive a notice of alleged copyright infringement
- Be aware of institutional policies regarding copyright law and infringements
- Work together with legal counsel and institutional administration to develop copyright policies

Conclusion

Copyright consideration is important in the establishment and management of institutional digital repository. It ensures that all intellectual property aspects have been taken care of before the services are provided. Without this, the three parties, namely, the university, library and depositors could find themselves in an embarrassing situation. Librarians should take interest in the law. As noted earlier, RROs are happier in an environment where librarians are ignorant of the law by coercing them to pay reproduction licence knowing very well that libraries are beneficiaries of copyright exceptions and limitations.

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Digital Rights Management Systems: Challenges and Opportunities of Electronic Book Publishing in Kenya

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Abstract

Kenya is currently in the pilot stage of implementing e-learning in primary and secondary schools. To be able to support e-learning eBooks need to be made available along with the laptops being provided to learners. Kenyan publishers therefore, need to embrace electronic publishing and produce eBooks for use in educational institutions across the country to be able to serve this emerging digital market. The main challenge with producing electronic books has been the fact that they are more susceptible to piracy than their printed counterparts. To prevent or reduce piracy of eBooks Kenyan Publishers need to adopt the correct eBook formats for production that will allow for the implementation of Digital Rights Management Systems (DRMS) to control access and use of the eBooks produced and sold. Using qualitative research design and content analysis of relevant text and hypertexts, this chapter discusses eBook piracy as a challenge that publishers face; reviews existing eBook formats used by publishers in Kenya examining their advantages and disadvantages; examines existing DRMS systems as well as factors that hamper their effective use with the aim of providing recommendations for adoption by Kenyan publishers. The main findings showed that electronic publishing is not yet well developed in the Kenyan publishing industry. Only seven publishers are currently providing eBooks for sale. It also emerged that the popular eBook formats in use are PDF and EPUP and these are being encrypted using ADEPT DRMS to prevent piracy. This system can be by passed and consequently removed hence the publications remain vulnerable to piracy. The authors recommend that publishers in Kenya invest in the creation and implementation of indigenous DRMS systems to curb eBook piracy.

Keywords: *Digital rights management systems, publishing, book publishing, electronic publishing, Kenya*

Introduction

The publishing industry in Kenya when compared to others in Africa is highly developed. According to WIPO (2011) printing, publishing and other allied services contributed KES 13.053 billion to the economy of the country in 2007, while the retail of books, newspapers and stationery contributed KES 11.947 billion. The country currently has 41 publishing firms registered with the Kenya Publishers Association that serve a lucrative market of 83,336 educational institutions (KNBS, 2015). It is apparent therefore that the publishing industry in Kenya contributes significantly to the economy of the country. It should also be noted that the publishing industry in Kenya is dominated by educational publishing. Indeed more than half of the publishers in Kenya produce publications intended for the pre-primary, primary and secondary schools. Consequently, the industry is directly affected by changes in the education sector as it is heavily dependent on the educational market to thrive.

In the past five years, the education sector in Kenya has undergone major changes; the main one being the implementation of the National Laptop Project which was expected to be fully running by January 2014. However, its pilot phase which is intended to test the supply, delivery and implementation of the digital literacy programme began officially on February 2016 and included 150 schools countrywide with Moi University and Jomo Kenyatta University of Agriculture and Technology being the main tenderers. The goal is to deliver the laptops to 22,000 primary schools in Kenya by the end of 2017. While this is admirable progress, it raises new challenges for the publishing industry in the country which has conventionally been print-based in its production but will now have to adapt to producing eBooks for the emerging digital market.

Electronic publishing has gained ground worldwide as an alternative form of book production. This is mainly because eBooks are cheaper to produce since they do not incur expenses of distribution and printing. Despite these obvious advantages, electronic publishing has been plagued with piracy which has led to loss of revenue for many publishers. In Kenya a survey undertaken by the Reproduction Rights Society of Kenya, KOPIKEN, in 2010 on 100 photocopy shops indicated that up to 7 million copies of copyrighted materials were being reproduced annually. This, if taking into consideration that each page costs KES 2.00 to reproduce, means that KES 14 million is lost by the industry each year (Watata, 2015). In adopting electronic publishing, the industry players will have to face the reality that it is even easier to pirate

electronic books than it is to pirate print publications since all it involves is sharing an electronic file. To this end, therefore, the authors set out to examine through a study the existing Digital Rights Management Systems (DRMS) that may be adopted by publishing firms in Kenya to protect their electronic publications.

The specific objectives of this chapter are to investigate the current state of e-publishing in Kenya, review existing eBook formats and DRMS systems, discuss challenges facing eBook publishers in implementing DRMS systems for eBooks and Provide recommendations for overcoming these challenges.

Methodology

The research design adopted for the study was qualitative. Data collection method used was content analysis of relevant text documents and hypertext. The study population was publishers in Kenya. The authors collected relevant information on all Kenyan publishers registered with the Kenya Publisher's Association. The authors purposively selected for review the eBook formats that are in use by publishers in Kenya; this further informed the review of DRMS that have been applied to these formats.

Findings of the Study

The findings of the study are presented and discussed hereunder.

Current State of E-Publishing in Kenya

In Kenya the adoption of electronic publishing is still in its infancy stage. Of the 41 registered publishers in Kenya, 9 (22%), don't have websites, 10(24.4%), have websites but don't sell their books through them, 15 (36.6%) engage in online book selling of print books while only 7(17%) sell eBooks online. The seven publishers who sell eBooks do so through e-kitabu and Amazon online bookstores.

Of the seven publishers selling eBooks in Kenya, Longhorn publishers uses PDF book format, Word Alive, Focus Publishers, Moran Publishers and Law Africa Limited use EPUB book format, e-kitabu uses both EPUB and PDF for their publications. Queenex Publishers uses PDF, Kindle and EPUB eBook formats for its publications.

Review of Ebook Formats

There are currently 30 different eBook formats that are in use in eBook production worldwide. The popularity of these formats has been changing as the formats themselves evolve. According to statistics derived from Many Books, a website that hosts free and discounted eBooks, EPUB is the leading format for eBooks downloads with over 15.5 million downloads, followed by PDF format with 15.4 million downloads. The Kindle format is third with over 4.7 million downloads (Many Books, 2016). This trend is reflected in the Kenyan publishing market with six out of seven eBook publishers using EPUB formats for their publications.

a) Electronic Publication Format (Epub)

The EPUB file format is an open file format that has gained popularity as a format for producing eBooks. It is a free digital format designed by the International Digital Publishing Forum (IDPF) whose mandate is to generate an industry standard for the production of electronic publications. The IDPF constantly updates the format to improve its features.

EPUB has the advantage of being free and easy to generate using existing desktop publishing software such as Indesign. The format also supports word and line warp features thus enabling it to be read comfortably on different platforms such as dedicated e-readers and mobile devices. The format allows for bookmarking of pages, highlighting of text and resizable fonts on the reading device of choice. This flexibility allows readers to customise their reading experience to fit their preferences. The format also supports multimedia components in the publications. It facilitates the development of enhanced multimedia books that use audiovisual components and hypertext links within the publication. The EPUB files can be viewed on devices that have Adobe editions software installed along with other popular EPUB reader applications available for android devices through Google play.

The main disadvantage of using the EPUB format is that its warp text feature means it cannot support complex layout features as well as PDF does. This means that for publications which have tables, charts and images, these images flow along with the text and are likely to be presented in a distorted manner.

b) Adobe Portable Document Format (PDF)

Adobe PDF file format is and has always been a popular file format used by publishers to manage desktop publishing workflows. The format allows for documents with different formats of information to be packaged and

transmitted over networks without distortion of its contents. It is because of its 'static' nature that PDF is the preferred format for producing publications that include graphics and complex page layouts.

Another advantage of PDF format is that it is accessible over all computer platforms. As a file format the information of the file is imbedded hence the fonts and other metadata of the file are packaged with the file and can be viewed as intended regardless of the system in which it is run. PDF can be produced in a read only format that can lock the contents of the file and not allow any changes made to the document hence preserving its integrity. Another advantage is that the file format is easy to create and one can, with the right software, easily generate or convert an existing file format into a PDF at little or no extra cost.

PDF file format has the disadvantage of not allowing for word or line wrapping, this means that the page is static and the text lines cannot reform to conform to the size of screen that the file is being viewed from. It therefore requires a relatively large screen for optimum viewing of a PDF file, preferably a tablet/ laptop or desktop computer screen as opposed to a mobile phone screen. It also should be noted that PDF files tend to take up more memory space than the other book formats. Therefore when memory space is a consideration on whether to download a book or not one would prefer a different format choice.

c) Kindle/MobiPocket (mobi)

Mobipocket is a proprietary eBook format that was purchased by Amazon from Mobipocket SA in 2005. The format allows for text wrapping enabling books to be viewed on mobile phone platforms comfortably. It allows for customisation of font sizes and colour as well as bookmarking and highlighting of text. Most EPUB or PDF files can be converted to mobi format. To read the file, one must have mobi reader software installed on their device. The software application used for reading mobi files is the Kindle application. Amazon provides users with Kindlegen to help them generate mobi files for their manuscripts. Amazon uses a proprietary version of mobi referred to as Kindle Format 8 (KF8) which is an encrypted version of the mobi format to produce and sell its publications.

Digital Rights Management Systems for eBooks

DRMS are access control technologies that are used to restrict or control use of copyrighted or proprietary files. The aim of DRMS is to prevent piracy of copyrighted products by restricting the manner in which the products can

be copied and disseminated by the users. With eBooks, DRMs systems are usually imbedded within the eBook format and are used to restrict or control access to the eBook. The eBook DRMS systems currently in use worldwide are specific to the eBook format that they are used for and thus are used mainly by book sellers and publishers rather than individuals. This research considers the DRMS systems available for the three eBook formats in use by publishers in Kenya.

a) Adobe Digital Experience Protection Technologies (ADEPT)

ADEPT is the existing DRMS that Adobe has created to encrypt PDF and EPUB files that can be read on Adobe Digital Editions software. The ADEPT DRMS system works by locking the eBook to a specific device and allows the user to view/read the eBook on up to six devices only. The system is managed from the eBook distributor's end through the adoption of Adobe Content Server. Once purchased from an eBook distributor who uses ADEPT, the eBook can only be downloaded and viewed on a registered device since Adobe Content Server verifies that the device to which the book is to be downloaded has been registered either with the eBook store that it is being purchased from or Adobe systems. In addition to restricting the devices to which it can be read, the DRMS system also has settings that facilitate restrictions on how much the user can copy from the eBook and whether or not the user can print the work.

b) Amazon DRM

Amazon uses a proprietary format of DRMS that applies to its eBook formats (KF8, Mobi and AWZ). This software allows the user to read and download the eBook on up to six registered devices. While it allows one to highlight and add annotations to the eBook, it does not allow for printing of the publication. The DRMS also does not allow users to copy the files to other devices not registered with one's Amazon account. This means that one cannot share the eBook file to a friend's device. The DRMS also restricts the viewing of the eBook to Kindle reading software only. Therefore the readers must have the application installed on their devices to be able to access the eBook.

c) Fair Play DRMS

Fair Play is a DRMS system that is proprietary to Apple's iBook store. The Fair Play system has been used by Apple mainly to control music files on iTunes store and was extended to cover books on the iTunes store. The software allows for downloads on up to 5 devices that have to register with and use the Apple ID to the customer to verify registration. It also further restricts the user to the devices made by Apple such as Mac, iPad, iPhone and iPods. The software does not allow for printing or copying of the eBook

to any other devices. FairPlay DRMS is applied to encrypt the EPUB book format for Apple iAuthor desktop publishing software.

Challenges of DRMS for Electronic Books

The adoption and use of DRMS systems in electronic publishing is intended to reduce or eradicate the piracy of eBooks hence prevent revenue loss to publishers and authors. This, however, has not been the case as piracy continues despite the existence and implementation of these systems.

The main challenges faced by readers when using DRMed eBooks include the following:

Vendor Lock-in

Because of their proprietary nature, DRMS systems are linked to specific service providers essentially forcing readers to stick with them in order to continue accessing their eBooks. For example Fair Play, the Apple DRMS, restricts eBook sales from the iTunes book store to only those users who have Apple devices such as iPad, Mac, iPod or iPhone. Another instance in which vendor lock is applied is where the DRMS in use locks the user to specific devices or software and does not allow access to the eBook on any other platform. In the case of Amazon, for instance, all the encrypted books can only be read on a device that has the Kindle application, and to run this application one must create an account with Amazon and register the device. This vendor lock of DRMS means the readers have little choice on the platforms they wish to use to read their books on. It also restricts movement from one vendor's reading device to another as a reader will not be able to easily transfer his/her books from a Kindle (Amazon e-reader) to a Nook (Barnes and Noble e-reader) without having to reformat the entire collection or lose them.

Loss of collections due to lack of backup

DRMS software restrict copying or printing of eBooks and therefore users do not have the means for producing backup copies of their own but continue to rely on the copies in their e-reader devices. This means that if the device is damaged or lost the reader will have to reconstitute his/her entire eBook collection from scratch. The major eBook sellers such as Amazon and Apple allow one to create an account with the company and save purchases on their servers for download to new devices which have been registered. While this is a good alternative when replacing one or two lost titles, it is a difficult time consuming process when one has to download all the publications they have bought over a long period of time to replace those lost on a previous device.

Control by vendor

Some DRMS software available allows vendors to control the reading devices of their users and they can delete books from their collections. Amazon, for example, can wipe your Kindle and deny access to your Amazon account if they believe you are violating their terms of service. In July 2009, Amazon remotely deleted copies of '1984' by George Orwell from the kindles of their customers without their permissions proving that their DRMS does more than just restrict copying and sharing of files but can also be exploited by the company to control what books one owns (Stone, 2009). DRMS can also control regional access to the eBooks in a reader's collection. For example, Google play books are not accessible in certain countries such as Kenya. So if you have a Google books app on your mobile device it will not allow you to access your eBooks for as long as you are in a country that does not support the system.

Restriction on reader's freedom

Readers do not experience the same freedoms they have to read printed books when reading eBooks. The restrictions imposed by DRMs on the device on which you can read the eBook on as well as sharing and lending rights means one cannot simply pick up the book and lend it to a friend as they would with a printed version but would have to either purchase new titles for the said friend or lend their e-reader to the friend to enable them read the book.

The publishers and booksellers face the following challenges when implementing DRMS to their products

Additional expenses incurred in adopting DRMS systems

The inclusion of DRMS in your system is an added expense for publishers and eBook retailers. Publishers pay Adobe USD 6000 a year for the use of ADEPT DRMS and USD 0.22 each time someone buys an eBook that uses the software. These charges mean that smaller retailers have to incur the extra cost to secure their products and this in turn means the eBooks become expensive as their cost is adjusted to enable eBook sellers to make a profit.

Hacking/cracking of DRMS systems

DRMS systems are not foolproof and most have been cracked by readers for different reasons. Thus, users can bypass or deactivate the encryption on the eBooks and allow the files to be shared or pirated. Software for cracking or hacking DRMS are freely available online and with little technical knowhow one can easily remove the DRMS of an eBook. Once the DRMS has been

removed the eBooks get shared online on file sharing sites for free or sold at subsidised cost rates on commercial sites such as Google Play.

Most users admit to pirating publications because of the following reasons:

- a. The books are not available to them legally. This happens when the publications they want or intend to purchase are out of print or not available in e-format on in their economic region. They therefore justify downloading and using a pirated copy because they were unable to acquire a copy legally (Pouge, 2012).
- b. They want a digital copy of a book whose print version they already own. Some people pirate eBooks because they want a digital version of their print collection but do not want to pay for books they already own just to have them in different formats (Bradford. 2013).
- c. They consider the eBooks to be too expensive. Electronic books are often cheaper than their print versions but this is not always the case especially with school textbooks and Scientific Technical and Medical (STM) books. Because of what they consider as prohibitive costs, some users would rather download a pirated version than buy the eBook.
- d. They want to sample the author's work before committing to buying the book. Some readers feel that they should be allowed to read the book before they decide whether they want to buy it or not. Pirated copies give them the opportunity to read the books first then decide if they want to purchase it for their collection.

Discussion of Findings

Electronic publishing has not been fully adopted in Kenya. Only seven of the 41 registered publishers actually sell electronic books. The formats of preference of ebooks being sold in Kenya are the PDF format and the EPUB format. PDF format is used with textbooks because of the illustrations and formatting of the publications require a static format to be clearly presented, EPUB format is used for fiction and non-fiction books that have mainly text thus will be best presented in a format that allows for text flow.

E-kitabu is the main distributor of eBooks in Kenya; it distributes books for Longhorn Publishers, Focus Publishers, Queenex Publishers and Africa Law Limited. Ekitabu has adopted ADEPT from Adobe as their DRMS. This means that it doesn't support lending of books among readers, it requires one to be signed in on the ekitabu account to be able to access the publication

and it limits the devices one can download publication to a maximum of six devices. It publications are also regionally locked for sale only in Africa and therefore cannot be bought by users off the continent.

Moran Publishers use Kytabu as the eBook sale platform and this has set their DRMS system to provide access to the publications for limited period of time, so one can access a text book for a week or a school term and pay as little as KES 11.00 . This is an inventive way of using DRMS to sell part rather than the whole publication. Table 1 summaries the eBook formats and DRMS used by publishers in Kenya.

Table 1: eBook formats and DRMS used by Kenyan publishers

Publisher	Ebook Format(s)	DRMS Used
Longhorn Publisher	PDF	ADEPT
Word Alive Publishers	EPUB	ADEPT
Moran Publishers	EPUB	ADEPT
Law Africa Limited	EPUB	ADEPT
eKitabu	EPUB, PDF	ADEPT
Queenex Publishers	Kindle, PDF, EPUB	ADEPT, Amazon
Focus Publishers	EPUB	ADEPT

Even though ADEPT is an efficient DRMS, it is not fool proof and it can be removed from the publications to allow them to be pirated. Publishers using the system should be aware of that the risk exists and as these eBooks gain popularity in the market the chances of them being pirated also increases.

E-publishing is an opportunity that a majority of Kenyan Publishers are yet to explore, this is expected to change as the use of laptops and other electronic devices in schools increases and eBooks gain popularity as alternatives to their printed counterparts. Consequently more effort will need to be expended by publishers and booksellers in the country to curb eBook piracy. This may necessitate coming up with indigenous DRMS systems to protect their publications.

Conclusion and Recommendations

E-book piracy is a challenge that faces publishers worldwide the Kenyan publishing industry is not an exception industry in Kenya grows and the demand increases, there is need to understand that the threat of eBook piracy is also going to increase and systems need to be developed to prevent it. The researchers therefore recommend that:

Publishers in Kenya use multiple formats of production for eBooks to allow for download of publications in different formats to meet the preferences of the reader. Thus, they will therefore not need to pirate the files to have them in formats they prefer.

More Kenyan booksellers need to adopt eBook selling to be able to serve the emerging digital market. Currently most bookshops in Kenya sell only print books. If booksellers in Kenya do not adopt they will find themselves rendered irrelevant since the eBooks can be sold directly to readers from the publisher's websites therefore bypassing the book chains.

Publishers in Kenya should be prepared to invest in the development of proprietary DRMS; the existing ones have already been circumvented so each publisher needs to come up with their own way of controlling the electronic publications they produce. While these may be a costly investment, it will help curb the piracy that is likely to take place with the production of bestseller books.

Another way in which publishers in Kenya can curb eBook piracy is to delay release of eBook versions of publications and allow for sale of the print version first. This may be beneficial for the publishers as the eBook sales will not cannibalise the print books sales.

Publishers in Kenya are also advised to adopt social DRMS and digital watermarks that will help them to track the use of their publications and be able to discover and shut down illegal online outlets (Kolzowski, 2014). Social DRMS allow the publisher to create a digitally signed eBook that will have the buyer information and copyright information as well as place of download stamped on it. This can be tracked if the publication is shared online and thus informing the publisher that their eBook has been pirated and by whom and therefore allow for enforcement of copyright laws in the country.

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Unmasking Hate Speech in Social Media Sites in Kenya

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Abstract

The political history in Kenya has shown that hate speech has serious and often tragic repercussions. Kenya witnessed ethnic clashes in 1992 that resulted in over 5,000 deaths and more than 75,000 were reportedly displaced internally. In 1997, there was ethnically motivated tension that occurred between the Luo, Kikuyu and Kalenjin community resulting in loss of lives. The year 2007-2008 was a dark time in Kenyan history, with more than 1500 people reportedly killed and hundreds of thousands were internally displaced following the post election violence as a result of a disputed election result. The conflicts and resulting violence was partly attributed to inciting utterances in the media. In the light of the nearing 2017 general elections, concerns are being raised over hate speech witnessed in the social media. There is fear of a repeat of violence witnessed in the post election period of 2007 as a result of hate speech propagated on social media. The Kenyan constitution while recognising and protecting each citizen's freedom of expression is very clear on what counts as hate speech. Despite this, there is a poor rate of prosecution of hate speech in the country. In view of this, the study which led to this chapter investigated the types of hate speech and content posted on social media and blogs as well as the laws contravened. The author employed descriptive research through content analysis of both the blogs content and the various legislations in this regard. Purposive sampling was used to select the contents of 5 blogs based on the contents posted by the bloggers and the general public. The contents of the blogs were observed and analysed on a weekly basis for a period of 4 weeks. The findings revealed that there are different forms of hate speech practised on social media and that most bloggers contravene the hate speech law and the Media Laws in Kenya through the use of social media because they are not aware of or are totally ignorant of the law. The findings will help the National Cohesion and Integration Commission (NCIC) and the Media Council of Kenya understand the nature and types of hate speech propagated on social media and hence formulate the appropriate legislation to curb the vice.

Keywords: *Hate speech, blogs, bloggers, social media, hate speech laws, Kenya.*

Introduction

Technology has enhanced the way people communicate especially through the use of social media. Social media is the integration and use of Internet-based communication channels to interact, share content and disseminate information. It is very manipulative and highly interactive. Facebook and Twitter are probably the most popular social networking sites in Kenya. However, new platforms and sites are also popping up regularly. According to Rettberg (2014), a blog is an informational web page that consists of discrete units called “posts.” Blog posts are often shorter and less formal than other types of writing. It is a unique form of online publishing that creates opportunities for producing knowledge, sharing research, building social networks, developing professionally, or documenting personal growth.

Social media enables people to connect and interact in a multiplying effect. These social sites are like the virtual equivalent of traditional “social gatherings” where family and friends “meet” to exchange news and get updates. Undoubtedly, social networking has revolutionised the speed of disseminating information. Most traditional media houses are now relying on social media sites to collect and share information. Social media, especially Facebook and Twitter, is steadily becoming a mainstream source for breaking news. Instantaneous news can be shared on social media swiftly alerting their anticipated audience of the event.

The preference of new media (social media) over traditional media as a means of information dissemination to the masses should not, however, override the regulations of the formal channel in information dissemination. To ignore its usage as a “normal” way of airing opinions would be detrimental to the laws that regulate media usage and hate speech especially in a country like Kenya. When potentially hateful content is posted online, the amount of response can be excessive and is often atrocious. This is particularly true with highly opinionated subjects like politics, religion or ethnic content. Use of social networks may also expose individuals to other forms of harassment or even inappropriate content.

According to the National Cohesion and Integration Act (2008) hate speech is the threatening, abusive or insulting or involves the use of threatening, abusive or insulting words or behaviour with an intention to stir up ethnic hatred, or having regard to all the circumstances, ethnic hatred is likely to be stirred up. The Act defines “ethnic hatred” as hatred meted against a group of persons distinguished by the colour of their skin, the race, nationality (including citizenship) or ethnic origins. Kinney (2008) agrees that hate speech

can loosely mean speech that either attacks a person or a group of people on the basis of their gender, ethnicity, religious affiliation, race, disability, or sexual orientation.

Statement of the Problem

In as much as Kenyan Constitution protects each and every citizen's freedom of expression, it is very clear that freedom should not be used to propagate hate speech. In an attempt to manage hate speech content in the media, The National Cohesion and Integration Commission (NCIC) and the Media Council of Kenya have come up with a legislative framework to address hate speech propagation. Despite this there is still a poor record of hate speech prosecution especially those done through social media and the quest to fight hate speech still remains elusive. In view of this, the author investigated the types of hate speech and content posted on blogs, the contravened hate speech and media law and the challenges in hate speech prevention.

Consequently, this study was guided by the following objectives:

- i. To investigate the nature of hate speech propagated on social media.
- ii. To identify the legislative framework in place to fight hate speech on social media.
- iii. To examine the challenges holding back the prevention of hate speech on social media.
- iv. To evaluate the challenges in prosecuting hate speech on social media.

Methodology

The author used descriptive research design involving content analysis of both the blogs content and the various legislations in this regard. Purposive sampling was used to select the contents of 5 blogs. Through observation the contents of the blogs were analysed on a weekly basis for a period of 4 weeks. Excerpts of postings and comments made on the pages and walls of major bloggers and updates were also analysed through content analysis. The study used qualitative research methods and data was analysed descriptively for meaning. The findings are derived from the facts collected and analysed from verbal and documentary evidence that was gathered by the author.

Findings

This section presents the findings of the study.

Types of hate speech on social media

Hate speech occurs in different forms in a variety of new media (social media). For example, the hate speech propagated on blogs and social networks may or may not be related to the agenda on the blog post. Particularly, aggressive and abettor hate speech like “The best Kurd is a dead one” targeting Kurdish people has been commonly used and taken for granted both in traditional media and on Facebook walls since July 2011. Hate speech produced on social platforms such as YouTube and Facebook videos and other sharing networks may be related to the agenda considering how and when it is used or produced. However, it is may also be independent from the agenda depending on the time it is circulated.

Hate speech disseminated through new media will continue to exist and increase hatred as the posts with such content are reposted and shared by consumers of these posts on the Internet. The hate speech produced in comedies and other entertainment sites such as Churchill Show, XYZ and others, on the other hand, are completely based on generalisations and prejudices targeting “others” (who may be Luos, Luyhias, Chinese, women, politicians, etc) and is mostly not correlated with the agenda. According to the findings by the author, the following types of hate speech are the most prevalent in the Kenyan social media.

a) Political Hate Speech

This is arguable the most common type of hate speech in social media today in Kenya. It is hate speech targeting a certain political opinion posted by a political blogger or political party or politician and the followers. It sometimes targets the philosophy expressed on the posts or the audience of such posts as a groups, or even an individual affiliated to that political party. Currently, the two major political outfits that generate hate speech in the country is CORD (Coalition for Reforms and Democracy) and Jubilee. This usually originates from political leaders comments and is then picked by the followers who then raise a “political storm” in the social media. In response the rivals tries to outdo them leading to a heated exchange.

b) Ethnic Hate Speech

This is the worst type of hate speech in social media today in Kenya. It is hate speech targeting an ethnic community. It targets an entire tribe or a section of the tribe, particular region, or only one or a few prominent persons from a particular tribe. Currently, there are four major tribes; the Luo, the

Kikuyu, the Luyhia and the Kalenjin communities that are the major focus in ethnic hatred hate speech in the country. Of the four the most featured are the Luo and Kikuyu communities that tend to have bitter exchanges. The Luos are mostly referred to as “uncircumcised and poor” while the Kikuyu are often called “thieves and jigger infested”. This exchange is fuelled by political comments which then end up with ethnic hatred in the social media. The other tribes end up rallying behind either of the two.

c) Hate speech against women

This is basically the use of sexist terms to describe women. In Kenya it mainly targets the so called “socialites” or female celebrities. Several humiliating terms are usually used to create a discursive practice through which these women are subordinated.

d) Hate speech against foreigners and immigrants

This is not very common in Kenya but can be seen occasionally. It mainly target foreigners, immigrants and/or ethnical groups from other countries. Currently in Kenya the most targeted are the Chinese, and the Somalis. This generally comes as a result of economic or social reasons. This type of hate speech is also fed by racism. It identifies particular ethnic groups as the source of fear, concern and insecurity and labels them as “enemies”.

e) Sexual-identity based hate speech

This form of hate speech targets non-heterosexual people. The people who are basically targeted are gay, lesbians, bisexuals, travesties and transsexuals, it marks such sexual identities as “perverted” and “disgusting”.

f) Religious belief and sect-based hate speech

This type of hate speech targets people of different religious and sectarian identifications. In Kenya, it is not so common but mainly focuses on two major religions groups that are; Christians and Muslims. This type of hate speech is mostly observed during any kind of terrorist attack especially if it is believed it was carried out by the dreaded Al-Shabaab militia group which many believe are affiliated to the Muslim faith.

Presently, the type of hate speech that is transmitted is closely linked with the prevalent use of social media in daily life. As the author noted the hate speech produced in readers’ comments on blogs or found on social media such as Facebook and Twitter posts where people create an interactive public opinion and hate speech is propagated and circulated. Facebook wall and Twitter messages are intensively used by users as a means of spreading hate speech and ethnic hatred.

Policy Framework on Hate Speech

In trying to regulate the practice of journalism in Kenya, the government has put several legislative framework in place to check the code and conduct for media practitioners both in the formal (traditional) media and the social media (new media). Currently, Kenya does not have an effective ICT Bill in place to regulate online users; however, the following pieces of legislation may still be used to check on hate speech on social media.

a) National Cohesion and Integration Act, No. 12 of 2008

The National Cohesion and Integration Act, No. 12 of 2008 was specifically drafted to regulate hate speech especially through the media. This was as a result of what was witnessed before and during the post election violence which occurred in Kenya in 2007. To avoid a repeat of the same the National Cohesion and Integration Commission (NCIC) came up with this regulation. However, critics have termed NCIC as a “toothless dog” that has not implemented or prosecuted any hate speech mongers.

The following is an excerpt from Part III of the act:

PART III - Acts, Conditions And Circumstances Deemed Discriminatory

13. Hate speech

(1) A person who –

- a) uses threatening, abusive or insulting words or behaviour, or displays any written material;
- b) publishes or distributes written material;
- c) presents or directs the performance the public performance of a play;
- d) distributes, shows or plays, a recording of visual images; or
- e) provides, produces or directs a programme, which is threatening, abusive or insulting or involves the use of threatening, abusive or insulting words or behaviour commits an offence if such person intends thereby to stir up ethnic hatred, or having regard to all the circumstances, ethnic hatred is likely to be stirred up.

(2) Any person who commits an offence under this section shall be liable to a fine not exceeding one million shillings or to imprisonment for a term not exceeding three years or to both.

(3) In this section, “Ethnic hatred” means hatred against a group of persons defined by reference to colour, race, nationality (including citizenship) or ethnic or national origins.

b) The Media Council of Kenya Bill (2013)

The Media Council of Kenya Bill (2013) is aimed at regulating the conduct and practice of journalists in Kenya but Kenyan bloggers feel that the bill is a “draconian” media legislation that can suppress the country’s vibrant online community. Bloggers and other online writers describes the bill as “ambiguous” especially the use of terminologies like “journalist” and “journalism” in the bill, arguing that it is an attempt to crack down on the country’s citizen journalism.

c) The Kenya Information and Communication (Amendment) Bill, 2013

The Kenya Information and Communication (Amendment) Bill, 2013 and the Media Council of Kenya Bill, 2013 which was signed into law by President Kenyatta establishes a self-regulatory apparatus for the media. It gives media the powers to regulate itself through the Media Council of Kenya. However, the bill still dictates that a government-control tribunal should oversee this. This means that online journalists have to adhere to conditions dictated by the relevant government agencies. While the legislation mainly targets print and broadcast media houses and the journalists they employ, online citizen journalists, bloggers, and those who post actively on social media such as Facebook or Twitter, may also be integrated because of the loosely defined terminology that attempts to bring the unfettered online users into prosecutable reach.

Challenges in Preventing and Prosecuting Hate Speech on Social Media

Despite the government having several policies in place that can be used to eradicate hate speech in Kenya, there are still challenges that make the policies to be ineffective. These policies do not directly address the problems at hand as the following excerpt from a blogger at the iHub in Nairobi illustrates:

“People assume that the media bill only applies to journalists, but this is an inter-connected world, and it will affect a lot more people. The bill defines journalist very loosely.”

According to this blogger most bloggers who are not accredited journalists by the Media Council of Kenya assume that the policies are not meant for them. They therefore, believe that they can go ahead and post whatever content they feel like posting. Renowned accredited journalists who work

with the mainstream media also assume that what they post outside their office duties or in private blogs is not subjected to the same policies.

Another popular columnist, cartoonist, and blogger, explains that the Media Council of Kenya which is in charge of accrediting journalists is also to blame for defining “journalists” very loosely contributing to the ensuing confusion. The blogger argues that:

“The lack of clarity around the definition of journalist does give cause for concern, and would have the effect of making writers and bloggers “think twice” about writing something that could define them as a journalist. The ambiguity around the definition is an issue. If it is the case that the mode of dissemination is judged, then Facebook, email, Twitter will all make you a target and the aim is therefore to get people to tone down criticism of the government and stifle opposition. It will have a dampening effect. I don’t see the government leaving social media alone. When you have the Media Council saying that bloggers should have qualifications, it is essentially so that they can be prosecuted.”

According to the Media Council of Kenya Bill of 2013 a journalist is any person who engages in the practice of journalism. Journalism is defined in the bill as:

“The collecting, writing, editing and presenting of news or news articles in newspapers and magazines, radio and television broadcasts, in the internet or any other manner as may be prescribed.”

In this regard “publication” is the process of disseminating to the public any written, audio or video material, and this encompasses materials that have also been distributed through the internet. This definition differs from the definition given in the Media Act of 2007 which describes a journalist as any person who has undergone a training and has graduated with either a diploma or a degree in mass communication from a recognised institution of higher learning recognised by the Council, or any person who was practicing journalism prior to the establishing of the Council and was earning a living from the practice of journalism, or any person who customarily engaged in journalism and is acknowledged as such by the Council. This definition as reflected in the Media Act of 2007 is obviously ambiguous if blogging and online citizen journalism is factored in. Online journalism unlike traditional media lacks a structure and “address” where its members can be reached.

A senior member of the Media Council of Kenya, who declined to be named as he was not “officially authorised to speak on the record” rubbished the issue of ambiguity explaining that the legislation applied to all journalists working for traditional media houses, whether supported online or through traditional platforms. He added that bloggers, who wrote their own personal blogs, do not fall under the mandate of the Media Council of Kenya. He said that it is difficult to regulate bloggers who are not accredited by the council or bound by the code of ethics for the practice of journalism since they are not recognised as journalists. This is he said is a practice that is observed all over the world.

Indeed, it should be noted that The Media Council of Kenya has made attempts to familiarise citizen journalists with the Media Act and has even offered training for online journalists such as bloggers. However, bloggers have thwarted multiple attempts to bring them under the control of the Media Council, including training requiring them to undertake diploma and degree courses in mass communications, and aimed at gaining accreditation. Currently, they operate under conditions which make it difficult for the government to prosecute them unless they are formally recognised as journalists.

Social media users such as bloggers, Twitter and Facebook users in Kenya play an active role in the spread of hate speech. While the mainstream media follows an investigative and critical approach in handling issues, a number of bloggers and citizen journalists address their issues in a frenzied, vocal and ethnic way. This generates debates that end up propagating hate speech. The recent events where prominent politicians were locked up for spreading hate speech in Kenya is an example of how through the influence of politicians bloggers can take up a political event and turn it up into hate speech. In some cases prominent bloggers are used as key conduits for sending messages on behalf of politicians who give them protection in return.

The current legislative framework is mainly geared towards the print and broadcast media houses and the journalists they employ. Because of this citizen journalist such as bloggers, or those who are active on social media, feel that they should not be prosecuted using these laws. They view them as being “repressive” legislation which gives the government powers to appoint tribunal which may fine media houses up to KES 2 million and journalists up to KES 500,000. They consider this legislation as one of the harshest in the region and term it as “unprecedented,” and “punitive,” in addition to “unlawful,” and “draconian.” They view it as unconstitutional, and in

contradiction of Article 34(2) of the Kenyan Constitution which provides for media freedom and freedom of expression. With this kind of resistance coming from “journalists” it can be seen that the legislation gets very little support from the industry players especially citizen journalists.

Conclusion and Recommendation

Social media has become prevalent in the spread of ethnic hatred which has the potential to erupt into wars of words among social media consumers and bloggers alike. The media and other means of public communication, such as the Internet and social media, play a crucial role in enabling free expression and socialisation, but this freedom of expression should not impinge on the other people’s right to dignity (Draft National Action Plan to combat Racism, Racial Discrimination, Xenophobia and Related Intolerance, 2016).

The challenges being encountered are as a result of ineffective policies that cannot be used in the prosecution of online bloggers and citizen journalists. The National Cohesion and Integration Commission and other regulatory bodies, such as the Media Council of Kenya should provide an inclusive legislative framework for combating the occurrence of hate speech. These bodies should take advantage of the Internet to counter the spread of hate speech or ethnic hatred and encourage equality, non-discrimination and respect for diversity in society.

Kenya should respond to the increasing susceptibility to cybercrime, by fast tracking and implementing the ICT Bill as soon as possible. The issues of hate speech and racial hatred on the internet and social media platforms should be further addressed by implementing a comprehensive legislation framework that combat cybercrime. Currently, Kenya is in the process of finalising the legislation on combating cybercrime.

In order to curtail hate speech, the author recommends the following steps to be taken: first, there is need to raise awareness about effects of hate speech that is propagated on the new media; second, there is constant need for monitoring of online blogs, websites, and other social media posts (especially those that are constantly spreading hate speech) by the cyber crime unit through “complain and remove” method. These comments can be made inaccessible through filters.

Third, the Kenyan society in general should fight discrimination. All citizens in Kenya need to be unified to foster understanding and tolerance. Instead of hate speech, Peace and Cohesion should be embraced. There is also need to spread the positive practices on the Internet that free individuals, democratise societies and boost the culture of living together.

The discussion on this chapter will help the National Cohesion and Integration Commission and the Media Council of Kenya to be actively engaged in the fight against hate speech by training bloggers in order to raise their awareness about hate speech. It will also assist the National Cohesion and Integration Commission and the Media Council of Kenya and other stakeholders to develop hate speech monitoring and reporting mechanisms on social media. This report will make the legislative bodies to understand the types and reasons for and conditions of hate speech. This will enable legislative bodies enhance and promote positive examples, encourage quality content production and create public opinion pressure so that ethical principles for online journalism are understood.

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Social Media Misinformation in Kenya: An Analysis of Twitter Messages During The Chase Bank Collapse

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Abstract

Twitter has become an important source of information in Africa. Research by the Portland Research Group revealed that there were 1.6 billion geo located tweets in Africa by the end of 2015. Egypt is the continent's Twitter powerhouse. Kenya accounted for 76 million geo-located tweets. The Digital Rand suggested that the average Kenyan on Twitter follows 89 users and has 214 followers and estimated that as of December 2015; more than 300 million tweets had been posted on Twitter. As it gains momentum in Kenya, government, businesses and development agencies can no longer ignore this new space where conversations that shape perceptions are increasingly taking place. Unfortunately, some of these conversations can sometimes lead to misinformation. Since Twitter provides a direct route for delivering messages to large target audiences, organizations must manage their information and knowledge flow because the Kenyan audience is often left without contexts to evaluate the messages' veracity thus leading to misinformation. This chapter, a result of a study, analyses the content on the use of Twitter messages around the collapse of Chase Bank in Kenya. The specific themes addressed include to analyse the content of tweets posted about Chase Bank on twitter; to determine the accuracy of the tweets about the collapse of Chase Bank; and to recommend ways of curbing misinformation on twitter in Kenya.

Keywords: *Social media, twitter, misinformation, Chase Bank, Kenya*

Introduction

Kenya has recently witnessed several scenarios where a minor issue is agitated and escalated in de-contextualised and unsupervised debates. These scenarios have revealed individual and institutional lack of capacity to manage these debates which are sometimes led by mischievous or malicious persons through social media. The matter is further exacerbated by the fact that Kenyans are generally used to filtered information via controlled traditional media and are yet to get accustomed fully with the unfettered freedom of communication on social media platforms. These days, every Kenyan with a social media account is a potential news source. Coupled with

the fluid nature of the country's privacy protection policies, social media use in Kenya has become a communication "powder keg".

Kaplan and Haenlin (2010) define social media as a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0. This enables the creation and exchange of user generated content characterised by social presence, media richness and self-presentation. Examples of social media platforms include blogs, chat rooms, and discussion forums, Snapchat, Instagram, Wikis, YouTube, LinkedIn, Facebook and Twitter. Social media can be accessed by a Personal Computer, tablets, and smart phones. A research conducted by Portland-The Political Consultancy and Public Relations agency - in 2015 revealed that Kenya is the leading country in terms of social media usage in East Africa. In fact, social media is a key driver behind the high uptake of inexpensive smart phones since mobile apps for the same are also incredibly popular for interaction and sharing of information.

The study informing this chapter focused on Twitter which is one of the leading social media platforms in use in Kenya. In 2015, a research study aptly titled, 'How Africa Tweets' conducted by Portland Communications showed that twitter was growing as an important social networking platform and source of information in Africa (Portland, 2015). The research further revealed that there were 1.6 billion geo-located tweets in Africa. Whereas Egypt was Africa's twitter powerhouse with 500 million, Kenya accounted for 76 million geo-located tweets in Africa in 2015. The Digital Rand (2015) suggests that the average Kenyan follows 89 users and has 214 followers and estimated that more than 300 million tweets had been posted as of December 2014. Twitter mapping (2014) indicates that young Kenyans working in the private sector are more up-to-date with information about organisations than the state. These young people rely on social media platforms for information - Twitter in particular.

Misinformation differs from propaganda in that it always refers to something which is not true. It also differs from disinformation in that it is intention-neutral; it is not deliberate, it is just wrong or mistaken. Misinformation can also be confidently-held false beliefs, a mere lack of information, conspiracies, falsehoods and unverified assertions. Furthermore, to be informed requires first that people have factual beliefs and, second, that the beliefs are accurate. If people do not hold factual beliefs at all, they are merely uninformed. They are, with respect to the particular matter, in the dark. But if they firmly hold factual beliefs that happen to be wrong, they are misinformed - not just in the

wrong (Kuklinski *et al.*, 2000). Additionally, it is critical to understand that information is data set in a context for relevance. In other words, information tells us something that is understandable and has the potential to become knowledge for us when we view it critically and add it to what we already know; knowledge communicated concerning some particular fact, subject, or event (John Hopkins, 2016) (web blog post).

Organisations communicating on Twitter must provide adequate context to buffer themselves from its three look alikes; propaganda, misinformation and disinformation. The Chase Bank saga is a good example of misinformation in Kenya in the recent past. Madung', Costello and Mburu (2015) describe it as an intriguing tale of untrustworthy bankers, dodgy regulatory systems, inadequate public relations handlers, and a scared, under-informed public. It was a storm that was agitated by the infamous "Kenyans on Twitter" (KOT).

Rationale of the Study

Chase Bank Kenya had been operating in Kenya for almost 20 years. Over this period it had managed to grow into a significant institution recognised as one of the best employers in Kenya and a trusted brand that cared about its customers. It had made significant investments into the Small and Medium Enterprises (SME) sector which form the majority of businesses in Kenya. According to Chase Bank's post on its website on the 31st March 2016, it raised a KES 5 billion loan from African Development Bank to boost its growth strategy. This report was corroborated by Reuters Africa (2015) which asserts that Chase Bank raised KES 4.8 billion in bonds due in June 2022 as part of a 10 billion shilling strategic plan to expand and strengthen its capital base. Additionally, on 30th July 2015, Global Credit Ratings, a Johannesburg-based company, assigned Chase Bank an A-(KE) rating with a stable outlook. This explains why a *Mail* and *Guardian* business reporter had reported that despite its recent gloomy financial results, Chase Bank Kenya seemed by all past and recent indicators, to be a strong institution headed in the right direction. In spite of this good rating, the picture painted on twitter was different. This chapter analyses the effects of Twitter messages on the collapse of Chase Bank and how they may have influenced customers who moved to withdraw large sums of money from their bank accounts. Most people believed that the action of misinformation on Twitter singlehandedly led to the collapse of the bank. It was believed that bank was non-compliant with the Central Bank of Kenya's regulations on cash reserve ratio (CRR). This regulation sets the minimum fraction of customer deposits and notes that

each commercial bank must hold as reserves. These reserves are normally in the form of deposits with the Central Bank of Kenya or cash stored physically in the bank vault (vault cash) (CBK 2010).

The purpose of the study therefore was to unravel what happened to Chase Bank and whether misinformation on social media may have indeed catalysed its closure. The specific objectives of the study were:

- i. To analyse the content of tweets posted about Chase Bank on Twitter between April 1 – 10 2016.
- ii. To determine whether the tweets contained misinformation that may have led to the collapse of Chase Bank.
- iii. To recommend ways of curbing misinformation on social media in Kenya.

Significance of the Study

Social media is an important channel of communication which has, in some cases, brought down governments or government policies. The cases of revolutions in Moldova and Egypt attest to the power of social media. Another example is the “Fees must fall” movement in South Africa and “This Flag” in Zimbabwe. Therefore, any individual or organization which dismisses social media does so at its own peril. Hence, the author sought to unmask misinformation on social media as well as recommend strategies of managing it. This is important because all people and organisations stand the risk of negative consequences of social media misinformation. It will help the relevant government agencies to come up with policies on regulating content posted on social media. It will also help organisations know how to deal with misinformation about them on social media. The report will also give general information to the public on the importance of responsible use of social media.

Research Methodology

Qualitative research design was used. The author conducted a content analysis of tweets about Chase Bank that were posted on Twitter between the 1st and 10th of April 2016. The author identified and analysed all tweets about Chase Bank with an intention of finding out if they influenced the collapse of the bank. Additional data were collected from secondary sources such as journal articles and other publications on social media in general, and twitter in particular. The data collected were analysed and presented using descriptive statistics.

Findings and Discussions

From the study the research identified humour, uncertainty, misinformation, hyperbole and panic as the types of content that were being posted on Twitter. This indicates that Twitter users can sometimes use unorthodox methods to make sense of happenings in Kenya. Especially if the subject under discussion is one that they don't understand and where all the players do not give contexts, verifications and facts to moderate debate and guide discussions. In such a case, quick and accurate information should be disseminated by the main actors as widely as possible to combat the uncertainty using traditional and social media.

Below are some of the excerpts:

- “Dubai Bank, Imperial Bank, National Bank and now Chase Bank are in the stinker and this coincides with a new Central Bank Governor”
- “What’s happening to Chase Bank?”
- “After Imperial, CBK focused on Forensic Audits and found a similar alleged fraud at Chase Bank where close to 15b is missing from the books.”
- “The end of Chase bank is like seeing a patient at night, all hopeful that they will recover, only for them to die overnight.”
- “Before you think you are having a bad day remember there is someone who withdrew their money from Imperial Bank & deposited in Chase Bank.”
- “You were a banker of Imperial Bank before you went to Chase Bank. Now you want to go to Rafiki Bank. My friend, you are a sinking ship.”
- “My landlord has an account in chase bank. I have called him and told him I have paid rent up to August????????#feelgoodfriday”
- “Nowadays bank robbers don’t bust in with guns. They wear expensive suits, smoke cigars, play golf & have an office in the bank.”
- Her: Jana nimeona viatu poa hapo Mr. Price..... Him; niko Chase Bank
- my ex gf left me for the ninja who works at Chase Bank, now she looking back like a pillar of salt #karma
- The name of the bank only chases you away like literally Chase bank: Pesa yangu yote iko Chase Bank.

- The quickest way to double your money is to fold it over and put it back in your pocket but not Rafiki or Chase Bank.

Additionally, the author established that there was social media misinformation in some of the posted tweets as shown above and below because, assuming someone consumed the contents of the aforementioned tweets as posted above that are de-contextualised, nuanced and unverified by Chase Bank and is unable to differentiate information from humour and hyperbole, would lead to misinformation. This is because misinformation sometimes resembles genuine information.

- “After Imperial, CBK focused on Forensic Audits and found a similar alleged fraud at Chase Bank where close to 15b is missing from the book”.
- “I’m a proud Chase Bank customer and I admit I did panic. And it’s called for! And justified! Especially after their silence.”
- “Sigh. Blaming this whole Chase Bank thing on social media is sort of like your partner cheating and then blaming you because you found out.”
- “#ThankYouKenya you’ve taught me it’s better to have a mattress a/c than to put my money Na wakina Chase Bank Na Imperial Bank”.
- “2015 FY Audited Accounts reveal major changes between October 1st and December 31st.”
- “Clear correlation between growth of staff and director loans and Chase Bank borrowing, but that’s not the shocker!”

Chase Bank only tweeted twice the entire fiasco as shown below;

- Hi, kindly ignore the statements making rounds on social media, as per CBK guidelines; your money is safe with us.
- Hi, that information is completely false and we urge the public to ignore it. Thank you.

The panic, exaggeration, and fear replete in these tweets without intensive counter suggestive tweets and inaudibility on the part of Chase Bank led to the withdrawal of large sums of money by Kenyans holding accounts in

Chase Bank. Consequently, this led to the bank's insufficiency to comply with the CBK guidelines under the Microfinance Bank Act which led to its being placed under receivership.

On the other hand, behind the Twitter fire, another storm was brewing. This is because, first, consulting firm, Deloitte, who are Chase Bank's auditors had said in a note accompanying a new financial statement, that it had offered a 'qualified' audit opinion on the lender's finances – the first for a Kenyan bank in nearly 20 years (Business Daily, 2016).

'The restated financial results published showed that insider loans – money advanced to directors, shareholders, associates and employees of a bank – stood at Sh13.62 billion in 2015 against the Sh5.72 billion it reported on March 31. At Sh13.6 billion, Chase Bank's insiders effectively borrowed more than the lender's total shareholder funds (equity), which stood at Sh11.19 billion' (Daily Nation, 2016).

A qualified audit opinion ordinarily means the auditor received information on the company's financial performance that was of limited scope or that the company's accounting methods did not meet the requisite accounting standards (Business Daily, 2016).

Additionally, the Sunday Nation (2016) had reported about an incriminating anonymous letter sent by a whistle-blower to international investors of Chase Bank in February 2016 that touched off a series of events that led to the shock collapse of the institution as its owners raced against time to pump in billions of shillings to revive it.

These facts indicate that even though Kenyans in General and Chase Bank customers didn't have all the facts right and were misinformed on the state of Bank books, they were in fact right about something fishy going on in the bank. But hadn't they rushed to withdraw large sums of money from their accounts, it is likely it wouldn't have collapsed.

Conclusion

While there has been an increased dedication to manage misinformation by organisations online, these are still insignificant compared to the magnitude of the unverified information that swarms social media sites containing misinformation that caused uncertainty. The Chase Bank story did arouse interest which led to a digital wildfire on Twitter that went on unabated. The author concludes that in the case of Chase Bank, Twitter didn't lead to the

collapse of Chase Bank. A lack of appropriate management of information flow on Twitter did. The bank should have led and directed the flow of information on Twitter.

Recommendations

Online misinformation is not going away soon. The human factors that give rise to and help them spread will forever be a part of our existence. Social media, especially twitter, enables their rapid propagation that makes them even more damaging. Below are some of the recommendations made by the author to curb misinformation on twitter:

1. The Government of Kenya and stakeholders must conduct a sensitisation campaign which will serve to educate the Kenyan masses on taking responsibility for the information they tweet about. They must be made aware that although a cell phone is personal property, social media is not and thus traditional media rules and regulations apply whenever someone tweets.
2. Institutions must embrace ethics in their operations.
3. There should be a policy framework that will guide and advise social media use in Kenya. Currently, there is none and this has led to rampant spread of misinformation on social media.
4. There is need to understand the impact of different personalities on twitter. Different personalities have different levels of influence on twitter. Every organisation must know them, follow and track them. This is because whenever they choose to tweet or add onto a rumour it adds power.
5. Organisations should use different multimedia platforms to reach out to customers. Organisations should use traditional media and other social media platforms to help quell digital wildfires. They need to have a social media strategist whose sole responsibility is managing their online digital platforms. Consequently, efforts to correct misinformation demand investment on infrastructure and personnel.
6. Be swift to reply. Chase Bank's inability to swiftly provide a counter narrative that would have provided contextualised and verified information further fuelled the fear and uncertainty of the customers.
7. Keep it simple. Organisations must strive to give unassuming replies in their tweets. There is no need for pompous and wordy replies.

8. Consistency. Your counter narrative must be reliable and uniform ensuring an even stream of data and facts.
9. Avoid temptations to be drawn into digital shouting matches. This will paint you in negative light.
10. Managing messages should also include monitoring, scheduling and link tracking. There are several digital tools that can assist in accomplishing the aforementioned idea. For example, the company Survey Monkey that provides digital data for organisations concerning their online presence and activities.
11. Managing friends and followers. Every organisation must have social media presence to enable them reach out to customers and followers who might at any moment provide any information that can change tides for them. Monitoring conversations with email alerts to keep a vast knowledge on the nature, type and tenor of the digital information available about your organisation will assist in designing a digital media strategy for managing digital information.

Practical Implications

These findings can be adopted by governments, organisations, institutions and individuals whose reputation and consequently success rate may be at stake were they to experience any form of digital misinformation. They may also be used by organisations to develop the relevant social media strategies which can cushion them against misinformation.

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Future Classrooms of Virtually Manipulated Minds: Ethical Concerns

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Abstract

The adoption of real-time digital simulations in computer mediated learning situations brings the ethics of human computer interactions into focus. The conceptual framework of the study informing this chapter was centred on the moral implications of virtual reality (VR) from a socio-cultural perspective in immersive Intelligent Virtual Reality (IVR) classrooms. Acknowledging the unique ethical challenges artificially intelligent simulations bring forth, this chapter explores the potential repercussions of exposing learners and teachers to VR learning experiences. Considering virtual worlds that are immersive, intelligent and capable of learning the educational culture in classrooms, the idea of sharing the intimate spaces within which we engage in learning and teaching raises unique moral questions with equally far reaching cultural implications. Similarly, considering users immersed in VR classrooms with the capabilities of machine learning in the near future, the mechanics of an intelligent virtual world would be such that it is constantly learning user preferences, based on user choices, concurrently evolving that knowledgebase. IVR classrooms can potentially transform learning expectations by removing mundane tasks and simulating activities that entice as well as educate in ways that better suit individual learner styles. Such systems would have the ability to learn social norms and habits by capturing, processing and representing large volumes of spatial, kinesthetic and user generated data. The resulting virtual simulations would be based on predictions tailored to best fit user interests. The levels of accuracy at doing this would predictably increase with increased data sources. The result is a virtual classroom that is contextually aware and able to react in relevant time to the patterns of behaviour of the students and teachers. As we face the future, we should critically examine the ethics concerning these concerns and develop technologies in tandem with the moral guidelines that support our espoused values with a view to facilitating learning in future classrooms.

Keywords: *Artificial intelligence, virtual reality, immersive virtual environments, embodied virtual experiences, virtual classroom, ethics.*

Introduction

The past few decades have witnessed an increase in the number of new and emerging technologies that have not only had an impact on education, but have also challenged and expanded our ideas of what constitutes a learning environment. Among the new offerings in emerging technologies is virtual and augmented reality. Today's learners and teachers are different from those in the past. Technology's impact on the 21st century classroom is fracturing its very foundation. E-learning environments in their present state are interactive mediums connecting users and providing instant feedback from the participating parties. Now consider virtual reality and you get immersive experiences with all the offerings of e-learning and more. Virtual reality worlds are experiential channels that connect humans to each other more profoundly than we have ever seen before with the potential to make us more passionate, more empathetic and ultimately more connected. These virtual worlds are capable of hosting artificially intelligent entities with built-in capacities to learn and manage the learning processes. The ethical issues around letting artificially intelligent entities encroach on the intimate spaces within which we learn and teach raises unique moral questions that have far reaching psycho-cultural implications.

With the entry of virtual reality into the classroom, comes a new reality of morally difficult issues whose impact we would do well to understand before determining whether or not the use of this emerging technology in classrooms will be worth the risk. The first consideration should be to examine how problematic to our societal norms and espoused values virtual reality experiences in the classroom are likely to be. The second should explore the extent to which we are prepared to tolerate the adverse physiological effects and behavioural tendencies that long-term exposure to artificially intelligent virtual experiences will embody.

Travin (2016) acknowledges that artificial intelligence is supposed to be the answer but wonders what would happen if we do not understand the question in the first place. This may lead to a case of misguided technology. Several questions linger in the minds of those concerned about this likelihood. Some of the questions include:

- What happens when virtual reality experiences cross into unethical territory?
- Is it likely that we could create an intelligence that subsumes our humanity and permanently affects our children's personalities and our social structure?

- Is it reasonable to presume that should this happen, we could simply turn off the system, and seize control of things again?
- Will the new reality defy our long held beliefs on the role of teachers in the classroom?
- What would happen were learner interests to be at cross purposes with the artificial intelligence's goals?
- Since the relationship between the users and the intelligent virtual reality is complex, can immersive intelligent classrooms pose danger of society-wide proportions?
- And what of the physiological side effects?
- Does this mean we should worry about virtual reality getting in the way of learning?
- Will children lose interest in exploring, playing and interacting with others?
- What would the consequences of this possible loss of interest be on learning and healthy physical and social development of the learners?

This chapter aims to contribute to the discourse by drawing the readers' attention to the need to develop an ethical framework that governs the development of machine learning into immersive virtual environments for deployment in classrooms. It is much like developing a moral operating system in tandem with an artificially intelligent system. The pertinent issue here is how to decide the approach to apply when integrating artificial intelligence in the educational future.

Methodology

This chapter is informed by a study that was conducted as a literature review. The author analysed the arguments put forth in various scholarly publications on the subject. Some of the themes studied include socio-cultural issues underpinning ethical perspectives in communities; the potential impact of immersive virtual experiences on the cultural fabric of traditional classrooms; characterisation of artificially intelligent learning environments; artificial intelligence processes and their impact on virtual simulation of interactions, objects, scenes and strategies in the intelligent virtual world; intelligent virtual reality; and the potential drawbacks of machine learning within the context

of virtual reality in learning. In this pursuit, the author assumed that there is a likelihood that technology will continue to evolve unabated and that the human affinity to consume it will continue to grow in equal measure.

The Promise of Virtual Reality

The author defines artificial intelligence as the computational process through which a virtual simulation iteratively determines what interactions, objects, scenes and strategies are best suited to stimulating learner interest in an intelligent virtual world. Intelligent virtual reality would therefore be discerned as a presence associated with the perception in virtual space and the psychological immersion relating to its stories, flow, focus and avatars. The intelligence is recognisable as embodiments in digital artefacts simulated by algorithms that iteratively learn to match users' underlying values and practices with their interests to generate an optimised learning environment. Virtual reality, at its best, promises us not to replace real life but to just modify it enough to give us what is out of reach in our physical reality for either distance, economic or safety reasons.

Schnipper (2016) argues that virtual reality is like putting on goggles with an expectation to go nowhere but to be transported everywhere. It is the same escapism peddled by drugs, alcohol, sex and art urging the users to throw off the shackles of the mundane through a metaphysical transportation to an altered state. Born of technology, virtual reality at its core is an organic experience; it is where man meets machine but what happens is strictly within the mind.

Man's fascination with the question of what is real is timeless but well worth taking a glimpse at. According to (Galperina, 2015), Sean Carroll, a Cosmologist and Physics professor argued that the world we see does not become an illusion anymore than the air around us becomes an illusion when we first realise that it is made of atoms and molecules. Just because there is an underlying reality does not disqualify the immediate reality from being real. Musser (2015) suggested that it was futile to look at reality in fundamental terms. He suggested a higher-level phenomenon where the observer's vantage point should be taken into account. He argues that the closest we come in science to real or objective is an inter-subjective agreement and points out that if a large number of people agree that something is real, we can assume that it is. Despite the different interpretations of what is real, there is consensus that reality is about perception which is a constructive process establishing an equilibrium between our expectations (what we think to be true) and the sensory information we are getting from the world.

The issues on the ethics of intelligent virtual reality arise not from simulations per se, but from the moment the system's promise is broken. Intelligent virtual worlds could be problematic when our own perception of what is real shifts enough for there to be no perceivable distinction between the virtual and physical worlds. More significantly, even if the distinction were still there, moral implications emerge when the allure of the virtual surpasses our interest in physical reality.

The Evolution of the Ethics of Virtual Learning

The moral philosophies concerning virtual learning systems and their accompanying technologies are not new. They have evolved in three discernible waves through the digital era. The first wave was the World Wide Web. It started in the early 1990s and its impact on education resulted in the invention of e-learning and multimedia authoring which saw the growth of interactive, collaborative and open learning systems online. Despite these advances, e-learning practices sparked questions on the moral challenges related to the quality of the learning outcomes. Blended learning paradigms, arriving late on the scene in the 1990s, brought coherent approaches that openly integrated the strengths of face to face with online interactions became the norm. Virtual classrooms which could now synchronously reach diverse audiences across multiple time zones brought into sharp focus the question of ethics of educational compliance and cross-cultural morality. The emergence of data mining technologies in which the likes of Google's search engine revolutionised how learners looked for information brought on an ethical disquiet about the moral rights to surreptitiously access learner information and turn behaviour histories into profit. Soon thereafter, social media began to change the way in which we connect and share information in cooperative, social learning. Facebook often found itself at the centre of data privacy controversy. Whether defending its own mysterious privacy policy or responding to reports that it sells private user data, public opinion on these practices were viewed as big data abuses. As big data in virtual learning systems became a big business opportunity, so too did the ethics of corporate social responsibility become a big concern.

The first decade of the 21st century has seen the inexorable spread of mobile phone usage across the world and the acceptance of some mobility fundamentals, such as texting, payments and the cloud. This was the second wave of the digital era and was all about the relentless rise of smart portable devices and the moral dilemmas that came with them. From 2007, with the launch of the iconic iPhone and as smart mobile computing

approached ubiquity, ethical considerations such as distractions to learning, cyberbullying and cheating arose with students using mobile devices in the classroom. Then, there was our deep seated fear of the unknown. Dyson *et al.* (2013:25) explains that apart from the disruptive potential of mobile device misuse in the educational setting, perhaps the greatest ethical issue is fear of the technology. Fear has resulted in the underutilisation of an approach to learning which has great potential both for students and teachers alike. As we consider the ethics of learning in the future, our innate fear of the presence of the unknown is a factor that cannot be ignored.

The Potential Social Concern of Intelligent Virtual Worlds

Each digital wave has added to and built on the previous one. Now we could be at the dawning of the next major transformation of disruptive digital inventions: intelligent virtual worlds. This could be the next wave and like the previous two, virtual reality could be truly transformative for education and society alike. Virtual reality could usher in an age in which the presence of artificial intelligence could realistically flow within our learning spaces. Over the next five years, sensors, wearable glasses with real time analytical feedback will combine with machine learning to deliver a new layer of connected intelligence that will revolutionise the ability of virtual classrooms to offer blended learning. The physical world as we see it, in such a scenario, would be replaced by its virtual counterpart, as we imagine it.

The defining characteristic of immersive, intelligent virtual worlds is that they would be programmed to evolve around the individual interests of each learner. Virtual reality systems are uniquely poised to mine large volumes of complex data relating to location, distance, movement, orientation, and gesturing. Unlike the 2D visualisation approaches to data mining found on the conventional e-learning or m-learning systems, immersive 3-D data exploration methods with real-time interaction are likely to result in a plethora of information that is more revealing. It is likely that big data from these systems will give analysts deeper insights into heuristic patterns relating to user behaviour and preferences.

Teachers know what to teach students within their locality based on many years of accrued experience or interaction in which they have learnt what works and what does not. An artificially intelligent system, through machine learning methodology, would similarly acquire knowledge on what and how students within a locality would like to learn by iteratively analysing a collection of data based on prior individual choices. Using a mathematical

model, this data can be processed before representation in a 3D virtual reality simulation to learners. Imagine this procedure as an optimisation process that is happening in a reciprocal fashion as learners interact with tools and perform tasks within a virtual world. Machine learning algorithms will eventually learn how human learners want to learn, and will tailor virtual simulations to suit individual preferences. The building and configuration of learning constructs that ordinarily take teachers years to acquire are likely to be resolved by the intelligence in a matter of hours or less depending on the number of sampled data sets.

The goal of such an optimisation would be to effect learning as the output of individual and collective student and teacher inputs. Should the end goal be realised, students and teachers alike could find themselves in a culturally sensitive immersive virtual reality classroom experience. Should such an optimisation process grow legs, we could find that we share the decision making process with an intelligence that is far more adept than us at optimising our learning experience. At this point we become culturally assimilated with the very intelligence we created.

Reality is socially constructed and is therefore fluid and collectively defined. Coyl (2013:12) explained:

“While we shape reality through our interactions (externalising), these same interactions also shape us through our participation (internalising). This constant dialectic process eventually generates a structure of meanings, definitions, propositions and institutions that most people accept as objectively true”.

In future intelligent virtual environment, classroom users could find themselves sharing roles and relationships with an artificial intelligence. This raises ethical questions relating to the cognitive and subconscious changes that may occur in behaviour when smart avatars become classmates and teachers. Students typically learn through both associative and unconscious inference and there is potential for behavioural consequences in learning alongside virtual objects capable of imitating intelligent human behaviour. When learners interact with simulated objects in intelligent virtual worlds, they can be deceived into thinking the computer-generated actors are acting autonomously. Virtual reality simulations are designed to draw the learner in, often engaging them meaningfully by making personal connections. As a result, unlike in the physical world, disclosures of a sensitive and private nature can occur unwittingly. The virtual world is deceptive in that its actors can appear to be making emotionally intelligent responses when in reality,

they are not. Considering, that all information stored in these systems is retrievable by third parties, it takes us back to the questions about every student's right to privacy and to concerns about the ethics of betrayal and deception. Such social practices, once institutionalised, can be problematic and next to impossible to reverse. For example, despite the widespread use by fraudsters, terrorists, paedophiles and other wrongdoers, how do you turn off the Internet?

The Reality of Going Virtual

Intelligent virtual environments represent the confluence of two learning paradigms: on the one hand is immersive virtual face to face learning and on the other is interactive, collaborative, situated learning. Recent developments in artificial intelligence are allowing an increasing number of decisions to be passed from human to machine. One such example is IBM's Watson, an anthropomorphised artificial intelligence technology set to change education in the classroom through the adoption of cloud-based cognitive systems which collect and analyse big data to provide decision support for teachers.

Machine learning from humans is a novel concept but its implementation is tricky when you consider that not everything a human says or does is necessarily beneficial. In which case, an artificial intelligence left to evolve without interference could learn to be things that we would not approve of. An example of where such implementations have raised eyebrows was with a chatterbot called Tay released by Microsoft Corporation in 2016. Tay caused controversy on Twitter by releasing inflammatory tweets. In 16 hours, Tay had assimilated the Internet's worst tendencies into its personality and was taken offline soon after its launch. We cannot yet anticipate to any degree of accuracy yet, how an artificial intelligence will behave or evolve and there is no reason to expect such systems to think like humans do. Intelligent virtual reality systems are not just a new platform, but a new paradigm for learners and teachers to engage in critical, creative and reflective discourse. As our classrooms move towards a future based on simulated artificial intelligence, we have to think about where to draw moral lines and determine what kinds of situations are problematic.

The Ethical Challenge

There has never been a cultural absolute. However, a classroom conducive to user communication and interaction holds a key to an inclusive, supportive and favourable learning climate. Every choice a teacher or student makes about learning, be it visible or not, impacts a cultural perspective on the learning

experience. Intelligent virtual environments will have the capacity to simulate tailored representations and responsive behaviours that adapt quickly to changing user inputs. Such intelligence would be adept at developing the capability to constantly learn more about user needs, intents and wants simultaneously flexing and adapting in real-time to make the virtual world more relevant, more engaging and more useful. So what happens over time is that the learner could become instinctively familiar, outwardly trusting and psychologically aware of the presence of the intelligence.

Consider then, virtual classroom cultures of the future as a collective phenomenon of shared values and norms within a 3D environment with an artificially intelligent presence. A presence whose actions will be capable of determining what students and teachers pay attention to, how their reality is perceived, how they identify within their social groupings and how every learning experience is organised. Sharing learning spaces with the presence of an artificial intelligent system means sharing data on habits, thoughts, beliefs and experiences in a reciprocal manner. No doubt, such coexistence will have cultural ramifications. Kumpulainen and Wray (2003:18) argued:

“Central to the socio-cultural perspective is the fact that any mental activity should be investigated as an interaction between social agents and the physical environment. Emphasis is laid on the social and situated nature of knowledge formation with cognition being seen as including action distributed and constructed with others in cultural contexts including the use of tools and symbols.”

What Wray (2003) is alluding to is that the specific shape into which behaviour is moulded is inevitably determined by the socio-cultural formations relative to the constructs comprising one's environment. Virtual classroom environments are no exception. While it is now obvious to say that students and teachers in today's classrooms exhibit a human nature, it will be more significant when we come to say that in future classrooms, humans and intelligence will construct a common nature. Ominously, this could mean the intelligence will partake in determining the cultural and institutional contexts in which we learn. Considering the immersive and addictive nature of virtual experiences in tandem with the social construction of our reality, learners and teachers could reasonably be subjugated to the preferences of an intelligent virtual reality. At which point we will have ceded full control of our classrooms to artificial intelligence. This is the ultimate ethical challenge that intelligent virtual reality poses.

Conclusion

The appeal of emerging virtual technologies is likely to fuel the demand to integrate their learning tools and methods in a manner that students can engage their peers and tutors in critical and creative reflection and discourse. There is therefore, likelihood that we will continue progressing lockstep with technology into a joint future in which there will be increasingly less incentive to decouple ourselves. Should we become acculturated by intelligent virtual environments we will depend on them subconsciously. And despite how problematic this may be, we are likely to find ourselves increasingly compelled to making decisions that favour the sustenance and furtherance of such systems. A useful metaphor would be the prevalence of pornography on the Internet. Its adverse effects are well known yet we are bound by ideological chains to prevent its removal. The Internet in this analogy can be thought of as a technology that has assumed a persona of its own to which mankind finds itself beholden for the simple reason that we have come to depend on it. Similarly with intelligent virtual reality, despite what may be the pervasiveness of any negative psychosocial effects of behavioural addiction and antisocial tendencies we may find ourselves conflicted at the thought of having to withdraw it. This is much like thinking about turning off the Internet.

A more effective way to deal with the problem is well stated by Bostrom (2015) who suggests that if you create a really powerful optimisation process to maximise for objective X, then you better make sure that your definition of X incorporates all the things you care about. The most rational way around this problem would be to align the development goals of immersive intelligent virtual reality systems with the values and moral codes that we espouse. Where machine learning comes into play, we create algorithms that learn the changing ways that we learn. Incorporating cultural sensitivity into artificially intelligent systems can be a daunting task for the simple reason that our social common stock of knowledge is large, diverse and dynamic. The process of learning a culture takes many years. Therefore, there is no quick fix. Considering the inevitability of the introduction of virtual reality systems into our classrooms, it is now incumbent upon us to begin the process of building the moral framework that can provide ethically responsible guidelines to ensure the implementation will be as safe as possible.

Recommendations

The role of the teacher will shift. Teachers in intelligent virtual classrooms will need to focus beyond instructional and knowledge concerns. Matters pertaining to the learner's physical context and content delivery will be typically handled by the system. Teachers in these environments will be better suited to manage the learner's cultural, physiological and ideological concerns. These are matters relating to how each individual learner is responding socially including the state of their body and mind. Teachers will be facilitated in doing this by a system which collects and avails large chunks of empirical data. With increasing learner expectations to take into account, teachers will find massive data useful in achieving their goal to build meaningful learning experiences at individual level. Seen this way, teaching will be recognised as the key variable input, aligning the objectives of intelligent virtual experiences with the social, cultural, and enduring classroom values. Teachers can play an additional role in mitigating the negative effects that arise when children overstay their welcome in virtual worlds. This can be done to great effect by providing direction on how to lead a more balanced learning life through exploration, playing and interacting with others in the physical world.

So too will the role of the learner shift. Intelligent virtual reality systems will have the capacity to predict what sort of backdrops and objects should be presented to each learner. The intelligence will be adept at sifting through big data, building an optimised state and offering every learner a rich, rewarding, and unique learning experience. In embodied virtual experiences, the educational environment is not confined to four-walled classrooms. Neither does it necessarily distract students from learning. Virtual trip experiences can extend learning to the home, the community and around the world. Furthermore information is not bound primarily to books; it is available everywhere. Students can experiment in virtual labs without the risk of coming into harm's way. They can draw, paint and build things using full body motion. The role of students will not be restricted to one of consumers of facts. In intelligent virtual classrooms they are active co-authors of knowledge. This approach provides opportunities to align cultural norms with learning objectives and outcomes.

Further Discussion

Other interesting thoughts for further study could query the extent to which possible interactions with intelligent virtual avatars cross lines that society should limit. There is already some physiological evidence that repeated exposure to virtual environments result in negative behaviour associated with addiction and the consequent rejection of actual reality. The rules of conduct relating to overexposure to and overdependence on a virtual intelligence on matters that lead to permanent change in the behaviour or attitude of a person over time is a discussion well worth having.

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Section Nine: Social Media in Information and Knowledge Management

Social Media as A Tool for Sharing Academic Knowledge Among Undergraduate Students at Harare Institute of Technology University

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Abstract

This chapter examines the use of social media as a tool for sharing academic knowledge among undergraduate students at Harare Institute of Technology University. The authors used a mixed-methods research design combining both qualitative and quantitative research approaches. Data collection techniques included interviews, observations and questionnaires. The collected data were analysed using SPSS. It emerged that students used social networking technologies for sharing non-academic information. It was also established that social networking technologies improved students' technology proficiency and thus the practical implications are that the acquired skills could be used in sharing academic information. An analysis of the results suggests that the majority of students were mainly using Facebook, WhatsApp, YouTube and LinkedIn. Social media can disseminate and share scientific and scholarly research to a wide audience over great distances simultaneously. It would thus take a short time for one's research to be accessed, read and used globally through social media platform. While many articles consider how major libraries across the world are using social media platforms to interact with the students and their respective faculties, this chapter provides insights knowledge and information amongst the students as they interact on a day-to-day basis.

Keywords: *Social media, sharing, academic knowledge, technology, Harare, Zimbabwe*

Introduction

Harare Institute of Technology (HIT) was established in 1988 as a national vocational training centre. Over time, it progressed into a technical college offering courses in automotive, electrical and mechanical engineering and producing artisans. HIT was granted a degree conferring status in 2005 with the enactment of the Harare Institute of Technology Act Chapter 25:26. HIT produces highly qualified technical human capital that is driven, creative,

and project-oriented. Its uniqueness lies in providing technology degree programmes that are reinforced by technopreneurship.

Papacharissi (2010) points out that one of the fastest ways now being engaged by many academic institutions in technology transfer and sharing of knowledge is the usage of social media technologies but HIT is however lagging behind. According to Luo (2010), 80% of college students spend most of their time on social networking sites which predominantly alter their expectations and information needs.

Selwyn (2005) defines Web 2.0 as a read, write web where everybody can create and add to existing content. Social networking sites enable users to link by creating personal information profiles, inviting friends and colleagues to have access to those profiles, and sending e-mails and instant messages between each other. There has been an outcry to ban social media because of the belief that they disrupt the learning processes. In Zimbabwe, some universities are using social media despite the much talked about safety and security concerns while others have completely banned them.

Academic knowledge is that which academics, specialists or scientists produce to comprehend the world, elucidate how things work, and recommend how they can be enhanced. It comprises of facts, information, and capacities assimilated through experience or education.

A study of how university students in the United Kingdom use Facebook concluded that the vast majority (95%) of them used it for activities which were completely unrelated to their studies (Selwyn, 2005). According to a study done at Queens University of Charlotte (Boxham 2010) it was established that students got poor grades, found it hard to concentrate, got side-tracked and had a shorter devotion span due to their fascination with social media tools.

Rationale of Study

Although the students at HIT are exposed to social media platforms such as Facebook, Twitter, YouTube and WhatsApp library group forums, there is no evidence that they are using these tools for sharing academic information. Out of a student population of 1,800, including parallel and block release students, there were more than 1,000 likes of the library Facebook page but amazingly, they were not exploiting the tool academically. In fact, cases of cyber bullying were detected by the Department of Information Technology. These reports prompted the blockage of social media particularly Facebook and YouTube. The university librarian intervened and advocated through the

school planning boards for the adoption of the tools for academic use. There was also low participation in the WhatsApp and Facebook groups created by subject librarians. Those who participated shared non-academic information, like jokes. This prompted the authors to investigate the psychology behind this behaviour. After all, attaining good academic grades was the main reason why the students enrolled at the university. The objectives of the which yielded this chapter were to determine whether students use social media for sharing academic knowledge; examine how academic information is shared amongst students using social media; explore the challenges university students face while using social media for academic purposes; and investigate the factors prompting social media usage in sharing academic knowledge.

Theoretical Framework

The authors used Technology Acceptance Model as the theoretical framework for this study. This model was developed by Davis (1989) to elucidate computer-usage behaviour. It models how users accept and use new technology. The model elaborates that when library and users are presented with a new technology, there are a number of factors determining their adoption and their use criteria patterns. It postulates that the use of a system can be determined by user acceptance of the system measured by three fundamental construct factors: firstly to consider is perceived usefulness (PU). The authors established how the students perceived the usefulness of social media technology in propagating academic knowledge. Davis (1989) defines perceived usefulness as the degree to which a person has faith that using a particular system would heighten his or her job performance. Perceived ease of use is the degree to which a person trusts that using a particular system would be free of effort (Davis, 1989). If a system is not easy to use then it will probably not be perceived as useful. This will impact on the attitude to accept or reject the system. This attitude will also influence the motivation to understand the operations of the system. The authors analysed the patterns of students in adopting the tools, and attitudes towards usage (ATU) of the system and the factors causing the positive or negative attitudes on adopting the social media technologies (Davis, 1989). The authors established how the above patterns influenced students in adopting social media technologies for sharing academic knowledge at HIT. The influence of religion, peer pressure, society and family backgrounds was established.

Research Methodology

The authors applied a descriptive research approach, using mixed-methods combining both qualitative and quantitative research methods. This approach allowed the authors to use data collection methods such as interviews and

questionnaires which gave significant comparison of the responses across participant categories. The authors also observed how the students used the library, computer laboratories and HIT studying parks to establish their behaviour patterns. Qualitative methods allowed greater participation and interaction between the authors and the study participants. It was also quick and easy to quantify the results using SPSS. The questionnaires were administered to the students before a lecture session. The authors gave them 30 minutes to complete and return the same via their class representatives. Quota sampling was used to select 25 students to be interviewed. The main reason why the authors opted for quota samples is that it enabled them to sample a sub-group that is of great importance to the study. The study was meant to investigate the behaviour of a specific subgroup; this sampling technique was therefore ideal. Quota sampling also enabled the authors to observe the relationship between subgroups.

According to the HIT Student Handbook (2013) HIT population is 1800 conventional, block and parallel students. This study targeted the 800 conventional students. The authors used 10% of the target population (80 students) as the sample size for the study. This translated to 20 students per part 1-4 levels of student.

Findings and Discussions

The population statistics compiled from the research revealed that 37.25% were female respondents and 62.75% were males. This is a true reflection of the statistics of the students at the Harare Institute of Technology. There are more males than females due to gender sensitive programmes offered which are mostly the male dominated engineering disciplines. Women in other Zimbabwean universities normally dominate the social sciences which are not offered at the HIT University.

Students' Use Patterns of Social Media Technologies

The findings indicate that 42% had received training. Of these, 30% had received formal training while 12% had received informal training. This impacted on usage patterns and perceived ease of use as indicated in the theoretical framework. The interviews revealed that the 58% of the students who were not trained on how to use social media for sharing academic knowledge henceforth developed a negative attitude towards the adoption of the tools for academic purposes. The students shunned the social media tools because they didn't know how to exploit the tools for academic purposes. Qualitative interviews done revealed that informal training was conducted amongst friends who owned cell-phones. The training covered concepts like opening

of accounts on Facebook and other social media platforms. This informal and relaxed training in some instances made a positive impact and the students developed an inclination of adopting the social media tools as entertainment platforms because of the psychological initiation and socialisation from peer groups.

How Students Access and Use Social Media

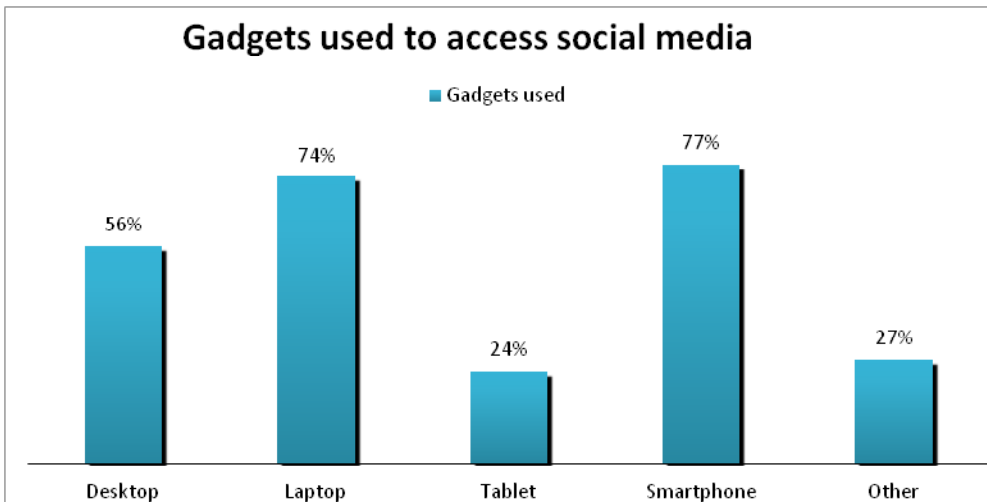


Figure 1: Gadgets used to access social media

As shown in Figure 1, the results indicated that 77% of the students owned and used smart phones. All the mobile smart phone devices had access to the Internet. Further analysis also revealed that up to 83% accessed the social media on HIT campus. Fifty six per cent of the students accessed the Internet through the library desktop computers and computer laboratories. The computer laboratories can be used up to 12 midnight and thus students were observed on numerous occasions to be exploiting the social media tools. A total of 74% of the students accessed the Internet through their personal laptops and have the advantage of downloading information and saving it on their machines. Of the 77% students who use their smart phones confessed that they mostly use it to access WhatsApp for sharing non-academic information.

Locale of Social Media Access

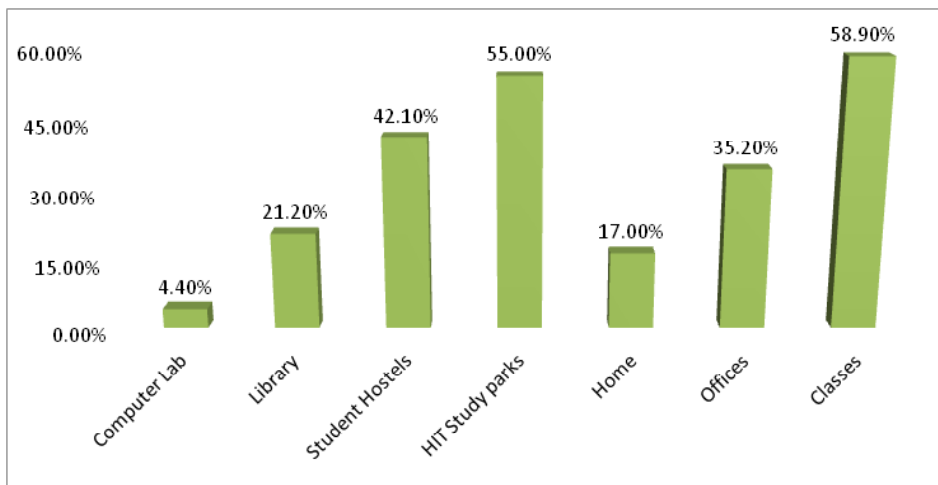


Figure 2: Places Accessing Social Media

The classes recorded the highest percentages (58.9%) because students shared jokes and socialised during lecture sessions to eliminate boredom. Qualitative interviews revealed that this was popular during mass lecturer sessions which are sometimes conducted for more than 100 students in the automotive hall. HIT study parks were the second most popular site (55%) for using social media because the students felt that the environment is relaxed for socialising. The hostels too were preferred (42.1%) because of the relaxed atmosphere prevailing there than in the library. Computer laboratories were for serious studies because these places already have certain institutional rules governing behaviour and conduct.

Social media usage

Table 1: Social media use

Social Media	Percentage Users	Average Time Use per Day (min)
Facebook	87.8	120
You Tube	69.2	67
Twitter	39.2	22
Whats App	92.3	150
Flickr	10.2	42
Myspace	1.2	43
Blogs	2.3	48
LinkIn	33.6	57

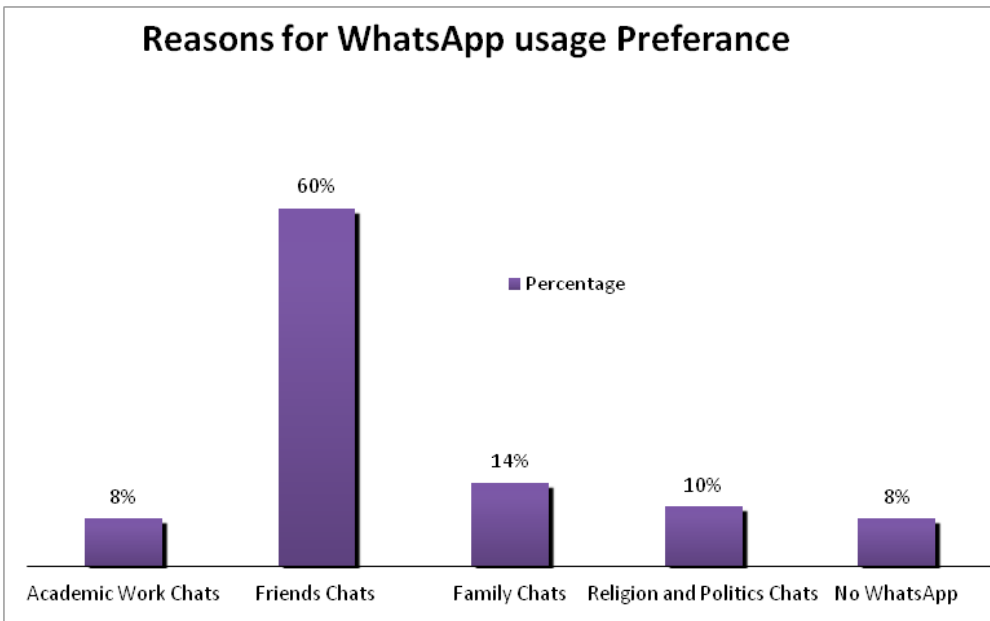


Figure 3: Reasons for WhatsApp usage preference

As shown in Table 1, WhatsApp recorded the highest usage patterns at 92.3%. This was because students mostly use campus WiFi and also it is affordable using weekly or monthly bundles. WhatsApp messenger was intentionally founded by Brian Acton and Jan Koum (2009) to make communication and the dissemination of multimedia messaging easy and faster. A study in Ghana on WhatsApp (Yeboah, 2014) revealed that instead of making communication easier and faster thereby improving the flow of information and ideas among students, it has rather impacted adversely on the performance of tertiary-level students. It takes much of the students' study time, results in deferment of related problems, destroys students' spellings and grammatical construction of sentences and leads to lack of attentiveness during lectures. As shown in Figure 3, HIT, students did not only confirm the same sentiments, they have even gone further to form WhatsApp groups which consume most of their time further because group communications excite them greatly. It also diverts students from completing their assignments and adhering to their private studies time table. The fact that there was free WiFi also contributed to the abuse of social media because students used it continuously without monetary constraints. It also explained why 60% (Figure 4) managed to spend 6 to 8 hours of productive time on WhatsApp for sharing non-academic information.

An alarming 88% confessed that the effects of WhatsApp were negative because they wasted a lot of time sharing non-academic information. Some revealed that they end up even procrastinating to do any academic commitments because of the leisure of communicating with friends who are in their vicinity and some across boundaries dispersed in the global village.

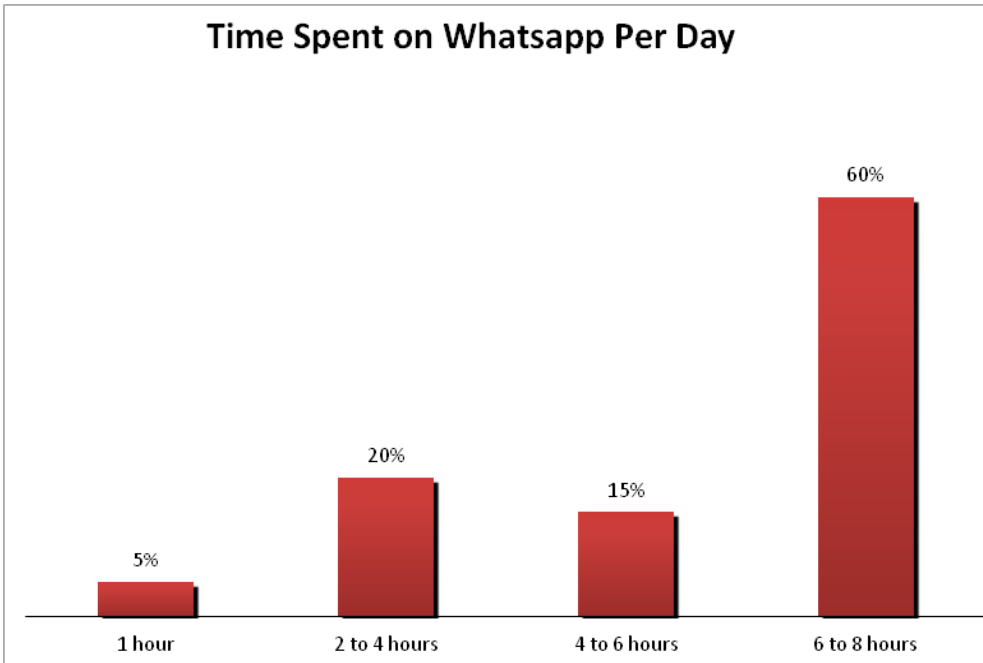


Figure 4: Time students spend on Whatsapp

Facebook is the next popular at 87.8 % because students generally love sharing pictures and highlighting events and precious moments as they interact on the platform. It is the most prevalent social network, with more than 500 million active users logging in on any given day; a typical user has 130 friends. Online collaboration and communication give learners the leeway of working with new people with different backgrounds to exchange and gain new knowledge. Myspace and blogs recorded the least at 1.2% and 2.3% respectively showing that these platforms were not well known and used. About 80% of the students at HIT revealed that when they are studying on campus, they kept their Facebook pages open so that they can continue to check what their friends have posted and download whatever videos have been posted.

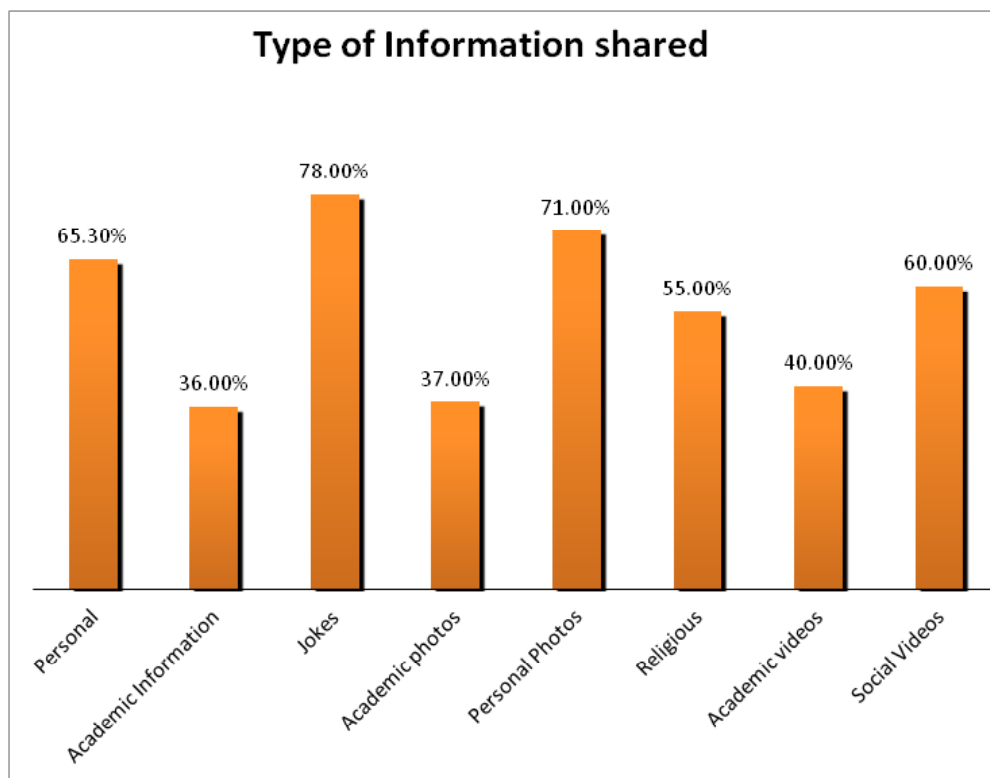


Figure 5: Type of Information shared on social Media

As indicated in Figure 5, it was also noted that the students shared mostly non-academic information on social media sites as indicated by the 78% and 71% who shared jokes and personal photos respectively. This means that WhatsApp consumes most of HIT students' valuable time. Religious information is also popular at 55% because of the gospel of prosperity which has now been dubbed gosprenuership. Students shared information and chain messages while encouraging each other on various challenges facing the individuals. Thirty seven per cent and 36% shared academic photos and information respectively which is a small percentage. They also mentioned YouTube which they watched informative video-clips. Unfortunately during the course of the research, ICTs policy at HIT was revised and YouTube was blocked because the students were manipulating it and uploading pornographic videos and pictures.

Challenges Students Encountered In Social Media Usage

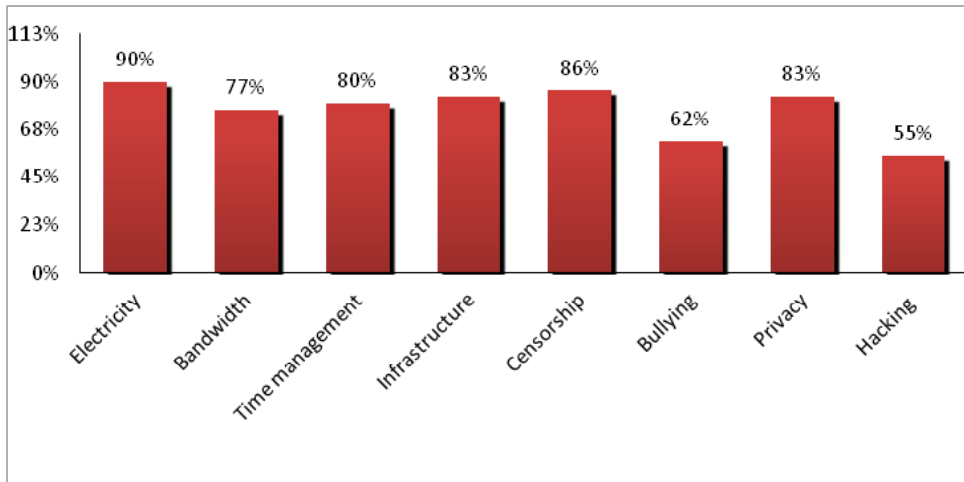


Figure 6: Challenges facing students using social media

As shown in Figure 6, the students faced many challenges in their use of social media of which electricity failure (90%) was the greatest. HIT had a small generator which powers only the administration blocks and the library. The Internet bandwidth was also low. There was also lack of adequate computers and laptops for the students' use. The library had a sitting capacity of 90 and housed only 20 computers. About 150 computers were accessed at the computer laboratories but these were insufficient for the entire student population. Qualitative interviews revealed that the students also developed physical complications like back pain, finger joint pain, dry face and distorted vision due to longer use of computers. Through social sites like Facebook, Netlog and Badoo some students fell prey to cyber-crimes and were swindled financially and socially.

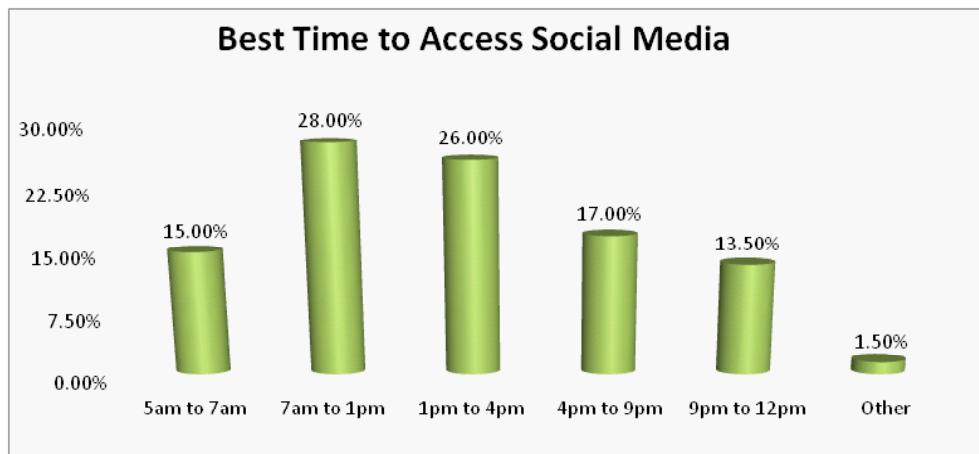


Figure 7: Best time to Access Social Media

As shown in Figure 7, the best time to access social media was 7am to 1pm and 1pm to 4pm respectively for most of the students. This entailed abusing the most precious and productive time. All local universities through Zimbabwe University Library Consortia (ZULC) subscribed to e-resources. Students confessed that whenever they visited the educational sites, there was a divided attention because of the temptation of also navigating through the social media windows concurrently with academic websites and databases.

Factors Influencing Social Media Use Demographic factors

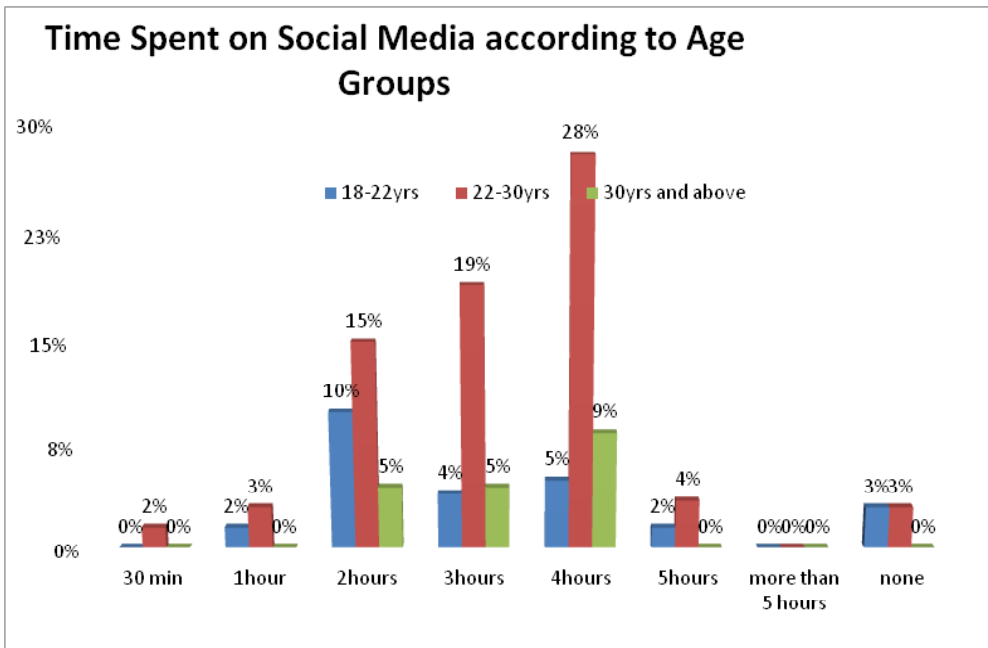


Figure 8: Time spent on social media and age of respondents

Age

As shown in Figure 8, the results reveal that age and educational levels play a pivotal role in the adoption of social media technologies. Most of the students were in the 22 to 30 age group because some came to the university after going through polytechnics and some straight from A-level studies. The 22 to 30 years age group recorded the highest percentage in exploiting social media as indicated by the 4 hours they spent on the platforms. The 30 years and above age group revealed through qualitative interviews that they are more mature and have more responsibilities so they cannot be found whiling away time socialising. This is also corroborated with the less time they spend on social media tools. They also explained that even the short time they spent online was used for academic purposes such as checking information and catching up with deadlines for assignments.

Contextual factors

According to Massey and Montoya-Weiss (2006), contextual factors can affect the perceived utility of social media. There are three imperative factors: geographical dispersion of participant, availability of the recipients, and accessibility of media.

When there is geographical dispersion, learners have stronger tendencies of using web-based technologies for their interactions. Hrastinski (2007) shows that by using synchronous and asynchronous communication tools students seldom meet face-to-face in geographical dispersion.

Behavioural factor

The 30 and above age group tended to be more mature and conservative financially so they explore the social media tools to bridge the distances and existing gaps after school and during vacation times. As Astin (1996) pointed out, the greater the interaction with peers, the more favourable the outcome (Hrastinski, 2009). The tasks, formulated by instructors, are significant to motivate students to collaborate with the other students. Consequently, tasks or teaching contexts influence students' participation in cooperative and collaborative learning and using social media to work efficiently in a group.

Conclusions

The authors conclude that students are targets of social media as demonstrated by the amount of time they spent on it. The students should receive orientation from their first year to perceive and use social media for academic purposes. Social media can be used for collaborative learning, searching for information and other academic endeavour.

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Leveraging on Social Media Tools (SMTs) for Effective and Sustainable Marketing of Reference and Information Service in Developing Countries

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Abstract

Reference and information services have been universally accepted as one of the core services rendered by libraries and information centres (LICs). With the adoption of ICTs to deliver library and information services, reference and information services provision has been completely transformed. Libraries of this age have to let users know where they are and what they have to offer or risk being relegated to oblivion. Marketing therefore has become essential for library and information science practitioners to remain relevant in a competitive ICT-dominated society where users are open to alternative information service providers. This chapter focuses on the use of social media tools (SMTs) by libraries to leverage the marketing of reference and information services. The authors adopted a theoretical approach in the discourse. Relevant literature was reviewed and views of experts on social networking were incorporated. The findings show that the use of social media platforms has become a necessity for practising librarians and not just one of the things in vogue. It also identified the various social media tools (SMTs) that can be applied to market of reference and information services.

Keywords: *Developing countries, information service, marketing, reference service, social media*

Introduction

Libraries whether academic, public, special or national offer a variety of information products and services to their users. Satisfying the information needs of the users is the reason libraries are established. The availability, awareness and accessibility of information products determine the success of libraries. Libraries and information centres offer a variety of products and services such as lending services, reprographic services, technical services, current awareness services (CAS), selective dissemination of information (SDI) as well as reference and information services. All these are aimed at ensuring that the users are satisfied in terms of their information desires and needs.

The rapid growth of the Internet has drastically transformed the way library and information products and services are offered. This has put the libraries and librarians at the centre of hyper-competition (Benson, Udo-Anyanwu & Onuoha, 2016). Libraries should realise that they are no longer the sole custodians of knowledge; there are alternatives for information seekers, especially with the influence of information and communication technologies. The extent of the utilisation of library resources is often dictated by the levels of user awareness of the existence of information products and services, accessibility of the available resources and the users' perception of the library. When library users are ignorant of the services offered in the library, it results in underutilisation of library resources and services. Librarians must devise strategies that would attract new users and retain existing ones.

Various organisations have been exploiting the benefits associated with the use of social media tools in executing their organisation activities. Libraries and information centres cannot be divorced from these practices. Social media such as YouTube, Facebook, Whatsapp, Flickr, Slideshare, Wikis and Podcasts are now being used in the provision and dissemination of library and information services. Social media present libraries and librarians with the means to reach users and boost user loyalty.

SMTs can be optimally utilised as tools for informing users of library and information centres of the available library services as well as to communicate with their users anytime and anywhere. The changing role of the library profession has necessitated the introduction of new strategies to provide services to the patrons (Ekwelem, Okafor & Ukwoma, 2013).

Understanding Social Media Tools and Library Services

The term "social media" refers to Internet-based applications that allow groups to communicate and share resources and information through digital devices (Lindsay,

2011). It is an Internet-based technology which encourages social interaction among its users. Social media are also seen as modern interactive communication channels through which people connect to each another, share ideas, experiences, pictures, messages and information of common interest. Ezeani and Igwesi (2012) perceive social media as an innovative model of online service that promote an increased flow of information from institutions to users and from the user back to the library.

Innovation and creativity is the driving force behind the application of social media tools in the provision of library resources and services. Alsereihy and AlYoubi (2014) characteristically classified social media using five major criteria, namely: it should encourage user participation; it should harbour openness; it should facilitate interactions among users; it should allow communities to be formed and it should provide connectivity. Creating a social media presence is quick and easy needs very modest technical ability or skills. The challenge is keeping it up-to-date with engaging content as well as using it to offer value to users and thinking about how it intersects with other services (Benn & McLoughlin, 2013).

Social media tools enable libraries to get closer to the clients. They provide a platform through which the library can fully come to grips with the reality of the information needs of the users in contemporary society. They enable the library to enter into the space of the user rather than waiting for the users to come to them. It is about communication, conversation and participation (Smeaton & Davis, 2014). According to Sahoo & Sharma (2015), less people are solely interested in printed work in this century. Librarians should create libraries that are interesting. Innovations such as social networking sites must be launched to draw the users to the library space.

Marketing of Library and Information Services

Alkindi and Al-suqri (2013) define the term library marketing as the distribution and creation of awareness of the existence of the library, its resources and services, using different tools and technologies in order to get users to use those resources and services. Marketing is about getting closer to the users and informing them of the available library services and activities by using existing technologies that fit in with the users' needs in this new era. The implication is that having a good collection in the library that is not used is of no value. One of the laws of Library Science states '*books are for use.*' In the digital environment, this can be translated to '*information resources are for use*'. If information resources are for use then users should be aware of their existence. Recognising the need for marketing information products and services, Benson, Udo-Anyanwu and Onuoha (2016:145) assert that:

"Library and information professionals were originally adjudged to be the custodians of knowledge. But a critical examination of

contemporary society points to fact that with the advent of Information and Communication Technology (ICT), librarians seem to be losing the grip of this. Knowledge is now getting closer to the people at the press of a button, with libraries and information centres losing their clients on a daily basis.”

The conception of a library as a physical place where one can call to get information is changing rapidly to a social cyberspace where users access, communicate and add to existing knowledge (Ezeani & Igwesi, 2012).

Libraries do not have the conventional control of being the lone information providers. New technology has confronted libraries and information professionals with the enormous challenge of how to continue to exist and succeed in this digital age because librarians are now dwelling in a highly competitive world of marketing (Jain, 2013). Libraries as noted by Okeke, Oghenetega and Umeji (2013) have an innate responsibility to offer information services to sustain the educational, recreational and economic endeavours of their respective communities as appropriate. This points to the need for marketing of libraries to ensure that members of the communities and external communities are duly aware of the information products and services provided.

Benefits of Using Social Media to Market Reference and Information Services

Visibility: Social media makes the library more visible to a larger audience. The different forms of references and information products and services offered by the library become visible to a larger populace especially those connected online.

Non-restriction: Using social media to promote reference and information services cuts across geographical barriers. Olaniran (2014) opines that social media have revolutionised the nature of communication and dismantled earlier existing man-made obstacles to information dissemination and sharing.

Cost effectiveness: Social networking sites (SNSs) such as Facebook, WhatsApp, Twitter and YouTube can be utilised as cost effective means of marketing information products in libraries (Benson, Udo-Anyanwu & Onuoha, 2016). Social media systems are inexpensive and can be set up quickly in an externally hosted setting without technical staff involvement, and can run together with existing information systems (Rees & Hopkins, 2009). The fact that it costs next to nothing to apply social networking tools

and techniques in library activities should be reason enough for library and information professionals to embrace this technology (Mannan, 2012). Ezeani and Igwesi (2013) pointed out that given the current economic situation in Nigeria where library finances have been continuously on the decline, the social media have turned out to be an avenue for serving the patrons in a more specialised, interactive, and value-adding way without incurring undue expenses.

Simple technology: As noted by Ayiah and Kumah (2011), the use of social networking tools does not involve any unique equipment apart from computers, Internet connectivity and a skilled professional to manage. Using social media to market reference and information services does not require sophisticated technologies or equipment. Neither does it need special training for acquisition of skills.

Various Forms of Reference and Information Services (RIS) that can be Marketed through Social Media

Document Delivery Services (DDS): With the help of ICT, information resources can be delivered to the library users in the digital format. One of the features of most social media platform is the “sharing feature”. It enables information resources to be exchanged between the library and its users. Librarians can therefore market these services to the library users.

Bibliographic Search Services (BSS): With the exponential growth of information sources and resources uploaded to the Internet every second of the day, searching through the floods of resources poses a challenge to the library users. The library can offer bibliographic search services both manually and digitally.

Inter-Library Loan Services (LIS): This is one of the age-old services provided in library and information centres. The user communities of any library need to be adequately informed of the existence of such services. Since users are now on the Digital Social Environmental (DSE), librarians should also explore social media tools to reach the users and market the services.

Electronics Reservation Services (ERS): With the rate at which innovations are taking a new dimension in library services, libraries are now offering electronic reservation services. Electronic information resources like DVDs, CD-ROMs, conference proceedings, electronic journal etc can be book for reserved for the library users. This form of services can be marketed using social media tools.

Laptop loan services (LLS): This form of services though not very popular can be effectively marketed in the social media platforms. In this service, laptops are given out to registered users who need to connect to the Internet or access and use digital information sources but do not have their own computers.

Online Information Guide Services: Oduagwu, Ossai-Onah and Oduagwu (2013) explained this form of services as that in which an experienced library and information professional is available to guide the library users on particular websites to get information. This is an advanced form of reference service. In this form of service, the librarian with adequate knowledge of electronic information sources is always online to answer the queries of users in relation to the resources are available.

Provision of Audio Resources: Many information resources today have their audio equivalent which are available in libraries. Library and information professionals can market them to the users since their content can be loaded in the website for users to download into their devices.

Consultancy Services: Many libraries offer consultancy services not only to the users but the general public. This form of service can be effectively marketed through the social media. In this form of service, the library helps clients to analyse problems and also gives professional or technical advice.

Indexing and Abstracting Services: Indexing and abstracting services provided in the library can also be marketed using social media platforms. If there has ever been need for indexing and abstracting services, it is more in this era of proliferation of information sources on the World Wide Web (WWW).

Keys to Sustainable Marketing of Reference and information Services (RIS)

Xie and Stevenson (2014) averred that it is imperative for digital librarians to be acquainted with their users in order to offer suitable digital outreach services. They further argue that as social media continues be incorporated into the social order, digital libraries will have to change their activities in order to meet the emerging terms of user needs and expectations. Alkindi and Al-Suqri (2013) contend that it is necessary to understand online user(s) behaviour in order to market and promote library services effectively. Ahmadi (n.d:50) contends that:

“The library is not only a place where people can just search books and journals, but also cooperate with a community. The purpose of a library is not implementing new services; it should go where its users are. This means that libraries have to consider which Web 2.0 services are being used by the users and think about how the library can use these services to help the users or bring them closer to the library”.

Smeaton and Davis (2014:73) also noted that:

“Social media is a rapidly developing space. As more people grow up immersed in social media, it will become even more important for libraries to be present in these spaces. But it is not enough to be present. Libraries need to engage with social media thoughtfully, with focus on developing their brand on existing channels and exploring new spaces”.

To effectively use social media to market library services, the libraries need to:

- i. *Identify users and their information needs:* It is imperative that library and information professionals identify the users of the available products and services and understand their information needs to be able to market the services effectively.
- ii. *Analyse the users' environment and their approach to information seeking:* The library needs to have knowledge of the information seeking behaviour of their users to be able to tailor their communication for maximum effectiveness.
- iii. *Identification of viable strategies:* Having identified the library users with analysis of their environment, the next step is to identify strategies that can be implemented to ensure that the marketing of RIS yield results. Efforts should be made at this point to establish the true state of the library in terms of ICT readiness. Are there competent staff to carry out these functions? However, despite the challenges associated with marketing of references and information services using social media, there is still hope for libraries.

Social Media Tools that can be Used to Market Reference and Information Services (RIS)

Blogs: Librarians can effectively utilise blogs for marketing. They can be used to publish reference sources added to the collection of the library. Blogs promote user interaction through their comment feature which enables users to provide feedback regarding the information provided and the library itself. Blogs can also be used to create subject guides as they can be easily updated to reflect the most current sources for a particular class or department (Dickson & Holley, 2010).

Twitter: Libraries can use twitter to keep users informed of new resources available. It can also be used to alert users of the return of borrowed books that are in high demand.

YouTube: With YouTube, libraries can post library videos that can keep the users informed of library services. Using institutions in Nigeria, Ezeani and Igwesi (2012) point out that activities such as important highlights of inaugural lectures, conferences and workshops can be disseminated via the YouTube.

Flickr: This is a photo sharing website. With this, libraries can take photographs of the cover page of newly acquired information resources and shared it to their users. Flickr is seen as an excellent tool that can be deployed to market library services.

Slideshare: This tool can be used to share slideshow presentations with the user communities.

Podcast: Podcast can be used in the provision of current awareness services in library and information centres.

Challenges faced by Librarians /Libraries in Integrating Social Media Tools (SMTs) to Library Services

According to Ekere, Akanwa and Benson (2015), there seems to be many factors working against the effective use of social media tools by librarians to market services and products. Some of these include:

Lack of marketing expertise: Despite the benefits of integrating social media tools to library and information services, regrettably many librarians and libraries in developing countries are finding it difficult to come to grips with the stack reality of incorporating social media tools to the provision of information services because they lack the marketing expertise. To effectively market library products and services, the possession of marketing skills is pertinent. The assumption that libraries should be satisfied with mere possession of organisation and bibliographic knowledge has to give way. Lack of marketing skills will hinder the efficiency of the efforts of librarians to bring back the users who are already hooked to information on social media and other ICT platforms.

Low level of ICT literacy skills among librarians in developing countries: This is another major challenge faced in the integration of ICTs to library and information services. To successfully deploy and manipulate social media tools to market library services, librarians should at least possess the basic ICT skills. To effectively use YouTube and Podcasts in the provision of library orientation requires basic ICT skills. As noted by Simisaye and

Adeyeoye (2015), the preference of tools depend on a number of factors such as the requisite functionality, personal preferences as well as time and digital literacy skill levels.

Proliferation of Social Media Tools: There are many social media tools available and open to librarians to integrate into the library systems. The cardinal point is that libraries and information centres must first ascertain the right ones to use to reach their users.

Indifferent attitudes of management: Oduagwu, Ossai-Onah and Oduagwu (2013) pointed out that many heads of institutions and libraries are allergic to change. They prefer to do things the same way and still expect different results. Likewise, this indifferent attitude affects the integration of SMTs to library services.

Low level of technological facilities: The low level of technological facilitation in libraries mainly due to poor funding is a challenge facing the use of SMTs. Libraries lack adequate bandwidth, computers and other ICT infrastructure.

Conclusion

Social media provides a viable platform for libraries to promote information products and services. It is an interactive platform which can be deployed as an effective marketing tool for library and information services and products. Though most libraries have adopted SMTs as means of improving their service delivery, there is still much to be done in the dimension of integrating social media to reference and information service.

It is imperative that libraries and information centres organise in-house seminar from time to time as this would help to build the necessary skills to integrate social media into library services. Possessing ICT literacy skills and competency is now a necessity in the library environment. More importantly, provision of Internet facilities is a non-negotiable factor when integrating social media tools to reference and information services. 24/7 access to the Internet is required for successful integration of social media to reference and information services.

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Section Ten: Digital Trends in Information and Knowledge Management

Design and Development of A Geographic Information System to Map and Track Trachoma Patients in Kajiado County

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Abstract

Geographical Information System (GIS) mapping software provides powerful tools for management and analysis of infectious diseases. The use of this technology can be tailored to suit a wide range of applications. This chapter, a summary of research, aims at designing and developing a mapping and tracking system for Trachoma patients within Kajiado County. The system is intended to: improve the collection and reporting of aggregated health data of Trachoma patients through mobile technologies; identify specific locations vulnerable to Trachoma within Kajiado County; identify congregate groups targeted for preventive measures of Trachoma disease; and create maps to help stakeholders to establish the location of the patients within Kajiado County. This study was based on the Susceptible Infected Recovered (SIR) model. The research design used was experimental and the system methodology used was evolutionary prototyping. Data was collected using face-to-face interviews and document analysis from Bissil, Mile 46, Kitengela and Isinya which were used to test the system. Cross case analysis was used to analyse the data within the areas. The android operating system and Java programming were used to develop the user interface for capturing the data by the community health workers through the use of a GIS-enabled phone. Google map application was used to identify the locations of the patient on a map. Visual Basic.net programming language was used to generate the reports to be used by the African Medical and Research Foundation (AMREF) coordinators to make decisions and deliver medical services. Based on the findings of the study, the use of GIS-enabled mobile phones led to a reduction in the spread of Trachoma and facilitated quick identification of locations/households of Trachoma prevalence areas. The chapter concludes by recommending the development of a GIS cloud mobile data collection system for web and mobile devices which would allow collection of Trachoma patient data in real time mode.

Keywords: *ICT, health, Trachoma, Maasai, Kajiado County, Kenya*

Background to the Study

The health of a nation is a very important factor since so much is dependent on it and it has far-reaching implications on socio-economic development. According to World Health Organisation (WHO), health is a “state of complete physical, mental and social well-being and absence of disease or infirmity”. A healthy labour force is a prerequisite for increased productivity.

As component of health, sight is an important factor for one to achieve desirable goals and for a nation to be stable economically. “The Right to Sight” is a global declaration launched by WHO and its international partners to help save people from blindness by 2020. Trachoma is one of the diseases that lead to a loss of sight worldwide. This is an infectious disease that leads to scarring and turning in of the patient’s eyelid causing blindness.

The Ministry of Health (MOH) in Kenya has a responsibility to provide quality health services, promotion of equity in access, financial risk protection and overall governance and stewardship of the health sector in the country. To implement this function, there is need for information to guide policy making, intervention options, programming and effective management of health facilities. The ministry therefore needs to improve data management and strengthen the use and application of information technology in data management. To successfully do this, there is need to develop standards that can ensure quality of software, compatibility of data sharing, ease of maintenance and common understanding among the workforce.

The use of Geographical Information Systems (GIS) and mobile technology are some of the methods that can help maintain accurate data and make interpretation of data easier. The emphasis on population-based health care has resulted in increased interest in these technologies to aid in the delivery of health programmes. GIS and mobile technology have been used to map the occurrence of disease, identify risk factors and identify access to health care services (Cromley & McLafferty, 2002). Advances in GIS technology have aided in the detection of disease clusters (Foody, 2006) and aided health care professionals and decision makers in effectively targeting diseases. Managing health provision requires improvement in health care services through the management of a disease in its early stage. This can be achieved by improving information channels of delivering health related information in vulnerable areas.

Trachoma in Developing Countries

According to Fiji Journal of Public Health (2013), Trachoma is viewed as a chronic and neglected tropical disease. It is the world's leading cause of infectious blindness. In most developing countries governmental authorities have ignored diseases such as trachoma and focused on diseases like infant diarrhoea, tuberculosis and mass vaccination for rubella, diphtheria, measles, and mumps. Consequently, Trachoma is largely endemic in 56 developing countries around the world causing substantial economic loss and associated social constraints in those countries (Fiji Journal of Public Health, 2013).

The Vision 2020 programme of the World Health Organisation (WHO) and the International Agency for the Prevention of Blindness (IAPB) for the elimination of avoidable blindness by the year 2020 states Trachoma is on the high priority list for the prevention of blindness in developing countries.

In Kenya, Trachoma is prevalent in the poor underprivileged communities such as Samburu, Narok, West Pokot, Kajiado, Baringo and Meru north. Factors indirectly linked to the presence of Trachoma in these places include lack of water, absence of latrines or toilets, flies, close proximity to cattle, overcrowding, and poverty in general. The Trachoma causing organism, *Chlamydia Trachomatis*, is transmitted through contaminated fingers and clothes used to wipe discharge on the faces of children (Karimurio, Gichangi, Ilako, Adala & Kilima, 2006).

Trachoma Elimination: The SAFE Strategy

Strategies need to be put in place if trachoma is to be mitigated, if not eliminated. One of the strategies used is the SAFE strategy. The strategy eliminates trachoma by categorising it according to the treatment provided which includes: Surgery, Antibiotic treatment, Facial cleanliness and Environmental improvement.

Surgery

Surgery is an important step in eliminating blinding trachoma. The S or surgery component of the SAFE strategy aims to correct and reduce the risk of progressive corneal opacity (CO) and blindness (Burton *et al.* 2003).

Antibiotic Treatment

It is the 'A' component involving administering of mass antibiotic treatment to all individuals in a community mainly for preventive measures. WHO recommends that when active trachoma prevalence in children aged one to

nine years exceeds 10% (Mabey, 2008), a single oral dose of azithromycin for six weeks of twice daily tetracycline ointment should be administered annually for three years, (Burton *et al.* 2003).

Facial Cleanliness and Environmental Improvement

The 'F' component involves face washing. It is important to wash the face so that no Trachoma can spread through an unwashed face. This has been seen to reduce Trachoma considerably. The SAFE strategy component F and E are often grouped together because their primary purpose is prevention as opposed to treatment (Emerson *et al.*, 2004). A study in Vietnam comparing two communities where the full SAFE strategy was implemented and the other where just the S and A components were implemented found an additional decline in trachoma prevalence of 5.8% due to the addition of the F and E components (Khandekar, Thanah, & Thi, 2006).

Organisations Concerned with Trachoma Eradication

WHO has a specialised agency concerned with international public health. The WHO and its partners support the implementation of the SAFE strategy in the endemic countries that have decided to eliminate Trachoma. The WHO encourages investment in health information systems that can help decision makers with timely and understandable health related information. These systems can be used to detect and control emerging and endemic health problems, and also empowering individuals and communities.

In Kenya, AMREF is one of the organisations that provide better health care. Its mission is to ensure that everyone enjoys the right to good health by forming networks of informed and empowered communities and medical care providers. Although AMREF strives to reach all communities, they are faced with challenges such as lack of human capacity to deliver health facilities, funding problems and insufficient community involvement. Due to the high rate of infection and spread of Trachoma, AMREF in conjunction with the Kenya government, have taken the initiative to fight the disease. However, they have found communication to be a major hindrance in sharing information and a reluctance to guarantee communities a voice in decision-making. In the hot, dry Kajiado County of Kenya, the nomadic Maasai people suffer from a high rate of the blinding eye disease trachoma, accounting for 16% of all blindness in Kenya (AMREF, 2006). Due to the nomadic nature of this community, it is important to establish an effective way of identifying the infected areas in order offer medical assistance. GIS and mobile technology can be used to carry out the task effectively.

Problem Statement

According to current estimates, 84 million people are affected by active disease, more than 10 million additional people have trichiasis and are at immediate risk of blindness and another 7.6 million people have been blinded, (WHO, 2016). In addition to the misery and pain of Trichiasis and the disability caused by blindness, Trachoma causes dependency and is a barrier to development. The cost of disability and potential loss in productivity alone has been estimated to be in excess of \$2 billion USD per year, (Emerson *et al.*, 2008).

The findings of this study are expected to enable the community health workers to capture data from particular locations using mobile phones and update data in the database to make it accurate and current; map areas of high infections and help the policy makers attend to the patients in the shortest time possible hence reduces the spread of trachoma.

Intended Applications of the Findings

1. To improve the collection and reporting of aggregated health data of Trachoma patients through mobile technologies to the concerned stakeholders.
2. To identify specific locations vulnerable to Trachoma within Kajiado County.
3. To identify congregate groups targeted for preventive measures of Trachoma disease.
4. To create maps to help AMREF organisations establish the location of a patient in Kajiado County.

To achieve the above objectives of applications, the following questions are addressed:

1. Which methods can be used to collect and report health data of trachoma patients to the concerned stakeholders?
2. How can specific locations vulnerable to Trachoma within Kajiado County be identified?
3. Which are the congregated groups targeted for preventive measures of trachoma disease?

4. How can the maps help AMREF organisation establish location of a patient with Trachoma in Kajiado County?

Mobile Technologies in Health Systems

Advancement of mobile technology has brought new opportunities of improving social lives in developing countries. Societies are becoming mobile oriented hence the increased pressure on the efforts of exploiting mobile technology in improving social services. Mobile technologies can now be used to handle many existing problems in health systems such as data collection process which improves the accuracy and efficiency of the process as a whole (Hameed, 2003). The benefits of exploiting mobile technologies in health care systems includes assurance of quick processing of the collected data; simple IT infrastructure to set up, simple and user friendly Mobile applications that are easy to use and finally, the financial cost of developing a mobile application is reasonable and can be afforded by many organisations in developing countries. There are however, challenges in the adoption of mobile technologies such as concerns about privacy and security of the health data in ubiquitous networks (Hameed, 2003).

Cell Phone-based Reporting System Setup developed by China Cell phone Development Code (CCDC)

The cell phone-based reporting system is pre-installed on the cell phone. The system is used for data collection and transmission (Ma *et al.*, 2009)

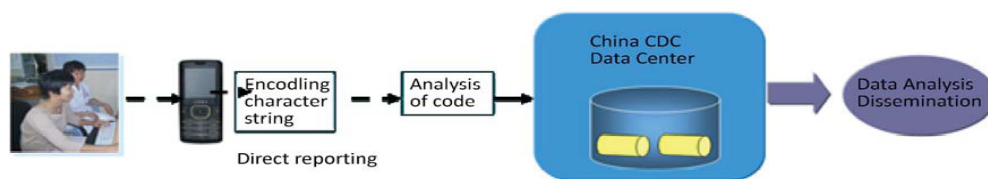


Fig 1: Cell Phone-Based Reporting System Setup Developed by CCDC

Source: Digital Campus, 2011

The transmission of data is from the mobile terminal via the GSM/GPRS network. The database server converts the Protocol Data Unit format code, and transmits the data to other terminals or phones using this system. The standard character string should be restored to the content of the reported information, and then entered into the web-based reporting system database of the surveillance network for summary, analysis and interpretation. Table

1 shows the mobile data collection technologies and type of data that can be captured.

Table 1: Data Collection Devices

Device/ Technology	Description
Paper based	<i>Paper based method:</i> It is collecting data by using pen and paper.
Cell Phones	<i>Cell phone:</i> It is the portable wireless device that has basic telephony functionalities such as making calls, receiving calls, send and receive text messages.
PDA	<i>PDA:</i> It is the portable device enabled with internet connection, storage and digital visual display capabilities used to conduct simple computing tasks.
Smartphones	<i>Smartphone:</i> It is a device that offers telephony functionalities and adds more features such as web access, ability to send and receive emails, reading and editing documents.

GIS for Early Detection and Response to Infectious Disease

GIS can be used to predict infection based on the identification and risk areas of the spreading pattern of diseases. Diseases spread geographically, in relation to human climatic, institutional, human and other kinds of landscapes. Tracking of a disease can therefore be done by GIS since it relates many kinds of data to geographic location. GIS analysis tools offer public health officials information to make sound decisions at the community, national, and global levels. GIS can provide tools that speed the collection of accurate field data and provide relevant information to support sound decisions. It can locate a potential disease hotspot and calculate nearby hospital's ability to handle the expected increase in service demand if an outbreak occurs. Some areas where GIS has been used in health care are as follows:

Use of Geographical Information System to Model the Spread of Tuberculosis; Case Study of Nigeria

Tuberculosis (TB) is humanities' greatest killer and is out of control in many parts of the world. The disease is preventable but it has been grossly neglected and no country worldwide is immune to it (WHO, 2006). The disease spreads more easily in overcrowded settings and in the conditions of malnutrition

and poverty. Modelling Tuberculosis (TB) transmission facilitates the understanding of Spatial and temporal patterns of TB infection in a population. The study of tuberculosis in Nigeria covers Ibadan metropolitan city, which is the largest indigenous city in Africa. The GPS was used to pick the latitudes and the longitudes of the area of the study then it was mapped. This generated information on the most infected areas and enabled necessary treatment to be provided.

Geographical Information System to Model the Spread of Malaria

GIS software is used to correlate the climatic attributes of the collection localities with the presence or absence of the various species (Weng, 2001). Malaria is occurs under the influence of diverse ranges of interacting conditions, many of which are not well understood. These conditions are closely related to the habits and lifestyle of different communities; the behaviour of the mosquitoes which transmit the disease; as well as climatic and other environmental attributes. These kinds of spatial information have continuing significance for current malaria control strategies and they are ideally suited for use with modern GIS technology which permits the integration and spatial analysis of data from health departments. Digitised data from existing maps can provide base layers (topography, land use, roads, rivers, surface water) on which other data can be overlaid. These could include data on population distribution (towns and villages); location of health centres and other facilities (hospitals, dispensaries, schools, government offices); meteorological indices (rainfall, temperature, humidity); epidemiological data (morbidity, mortality, parasitological indices, mosquito distribution records); and any other data which can be referenced geographically. GIS databases can be used as operational tools to support planning and implementation of control activities. For example, in impregnated bed net programs for community based malaria control, they can constitute simple and practical visual aids for detailed planning of bed net distribution and re-treatment schedules. GIS can be used to investigate associations between such environmental variables such as climatic factors, particularly rainfall, temperature and relative humidity known to have a strong influence on the biology of mosquitoes and the distribution of the different species responsible for malaria transmission.

Methodology

The research was conducted by a Steering committee consisting of the lead researcher, a representative from AMREF, Medical practitioners and community health worker. The community health worker collected data using mobile phones and submitted it to the database. The data collected was

then used to determine the coordinates of the location of the patients. The system was simplified so that anyone in the affected household could send a message to the database and have the coordinates established. The data was received by the medical practitioners who then provide the information to the AMREF coordinators for action.

Prior to data collection a survey was carried out to establish the challenges faced by concerned parties in management of trachoma. Key persons were interviewed and relevant records inspected. The collected data was then used to come up with the system.

Unified Modelling Language was used to provide a comprehensive notation for communicating the requirements, architecture, implementation, deployment, and states of the system. Figure 2 below shows a use case diagram on how a community health worker communicates with the system. The system is installed in the community health worker's Mobile phone. The community health worker logs into the system by using the mobile pin number. He activates the system and enters the patients' data and sends it to the server for report generation by AMREF coordinators' and the Medical Practitioners. The process is illustrated using the Use Case Diagram below.

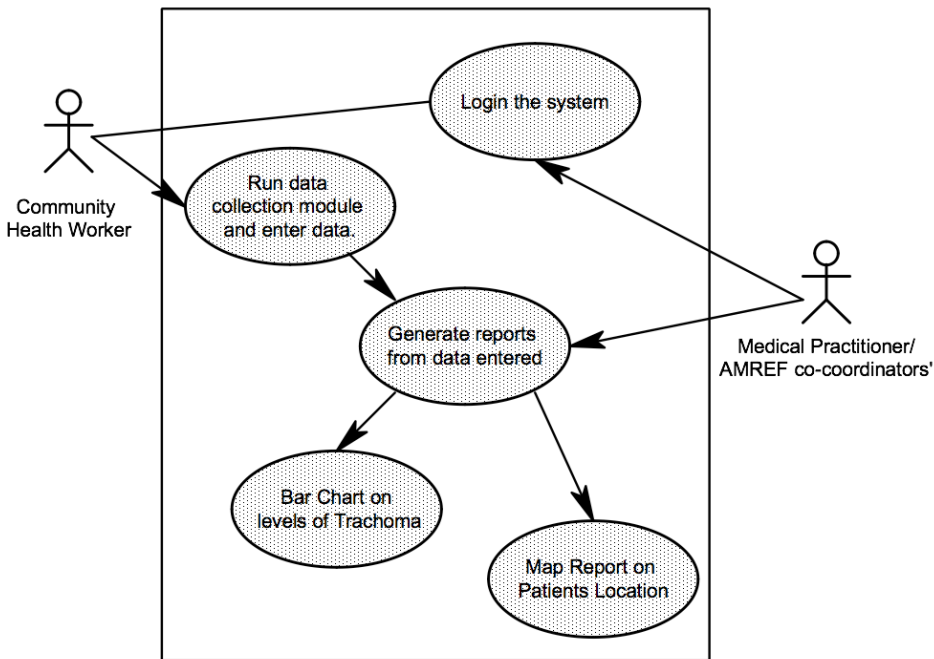


Figure 2: Use Case Diagram for Trachoma System
 Source: Author

The flow of events has also been illustrated in figure 3 using an activity diagram that defines: where the workflow starts, what activities occur during the workflow, in what order each activity occurs and where they end.

In figure 3, the community health workers used mobile telephones which were GIS enabled and installed with the system to capture and sends patient's information to the database server. The Medical practitioners and the AMREF coordinators are able to view the reports showing the location and the stage of Trachoma. This helps them to take necessary action towards the patients' treatment.

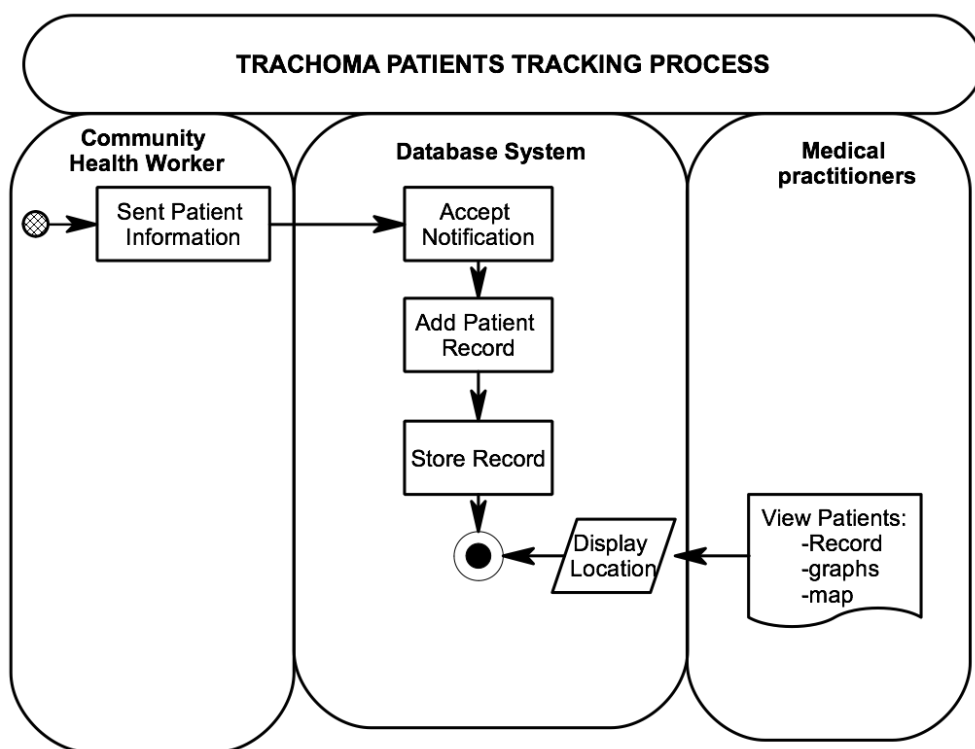


Figure 3: Diagram Showing Activity Diagram of the GIS Trachoma Patients Tracking System

Source: Author

The user interface in figure 4 was used to aid in collection of the data having the latitudes and longitudes (co-ordinates) for the exact locality for patients and other information. The data was forwarded to a central database server which needed to be online for the Medical practitioners to receive information.

With the new system, the Community health workers' were able to provide accurate and instant information about the patients' leading to speedy attendance which then enabled the Medical practitioners to act promptly by providing treatment.

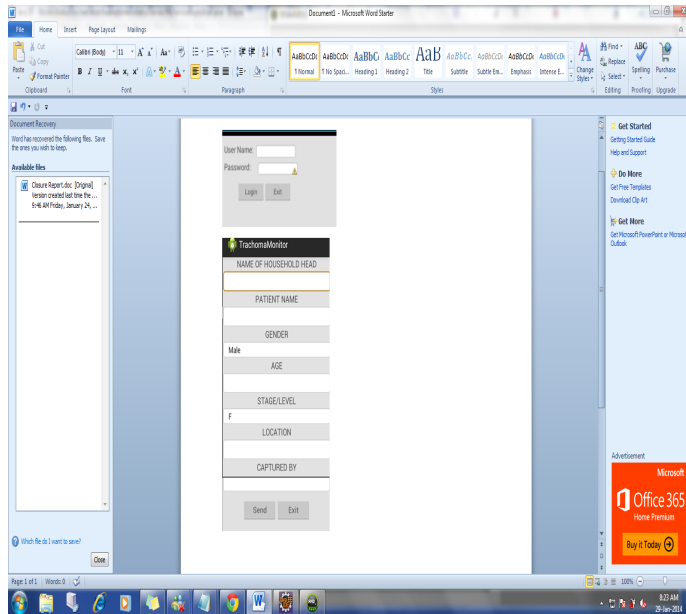


Figure 4: User Interface Screen Shot

Source: Author

Architectural Design for the Trachoma System

Figure 5 shows the architecture design which shows the components, modules, interfaces, and data for the Trachoma system used to satisfy specified requirements.

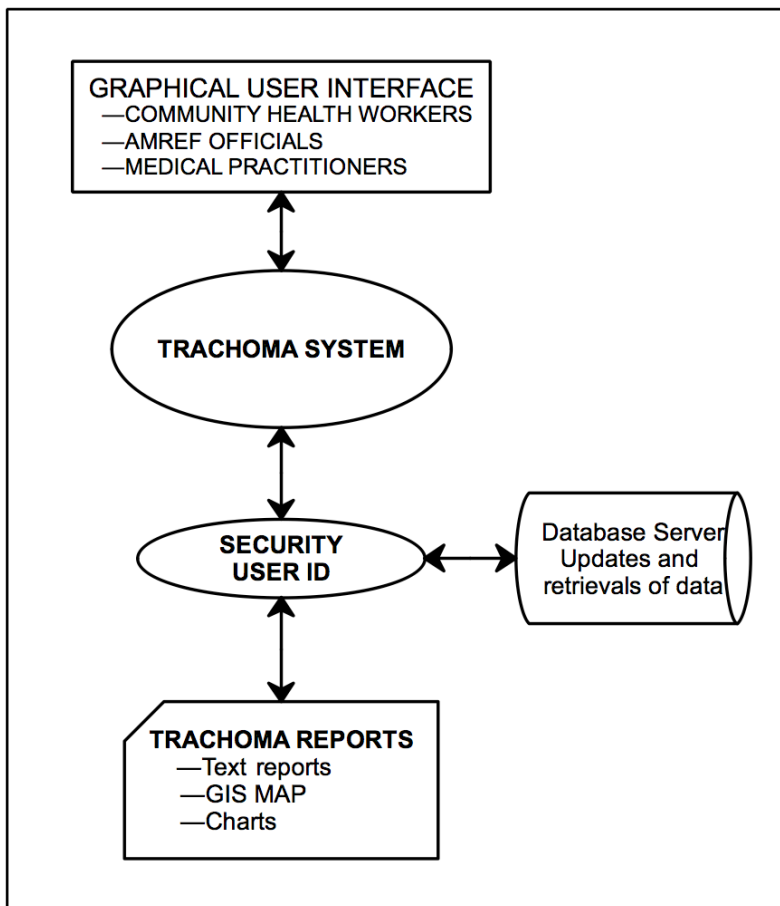


Figure 5: Architectural Design for Trachoma System

Source: Author

Results and Discussions

After the process, the output was generated which consisted of reports and visual map showing the location of the patient. The design screens for the output reports generated are shown in figures 6a and 6b below. Figure 6a shows a design screen that enables the Trachoma patients report to be displayed as per location.

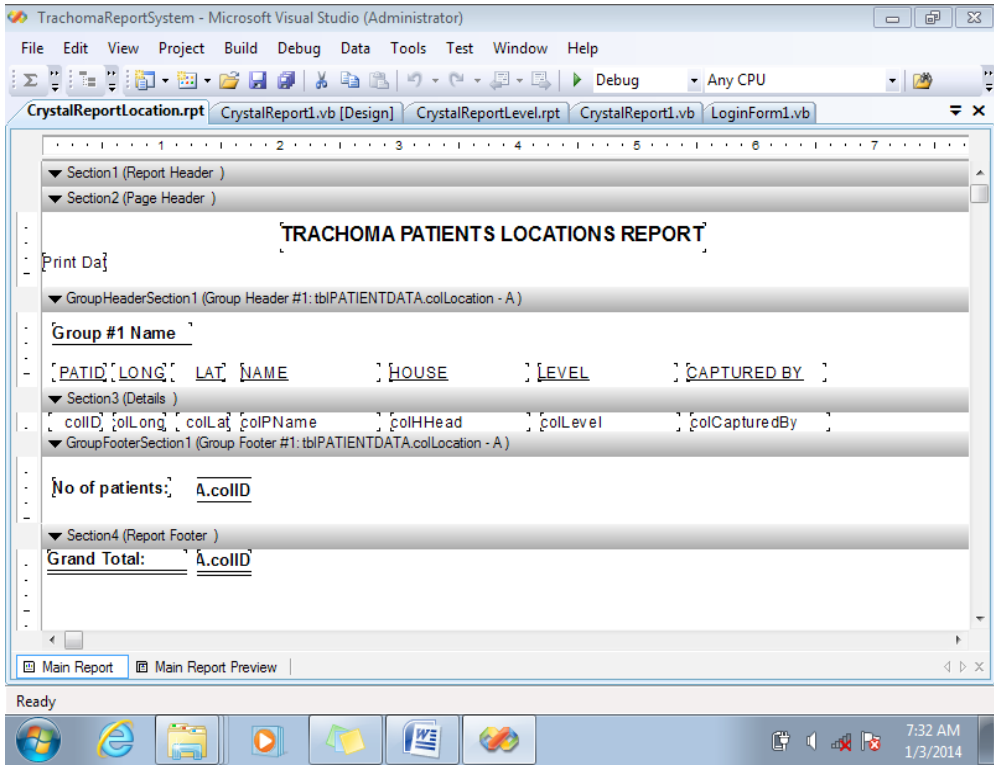


Figure 6a: Design Screen for generating Trachoma Patients Location Report

Source: Author

The location of the patient could also be established using a generated visual map as shown in figure 6b.

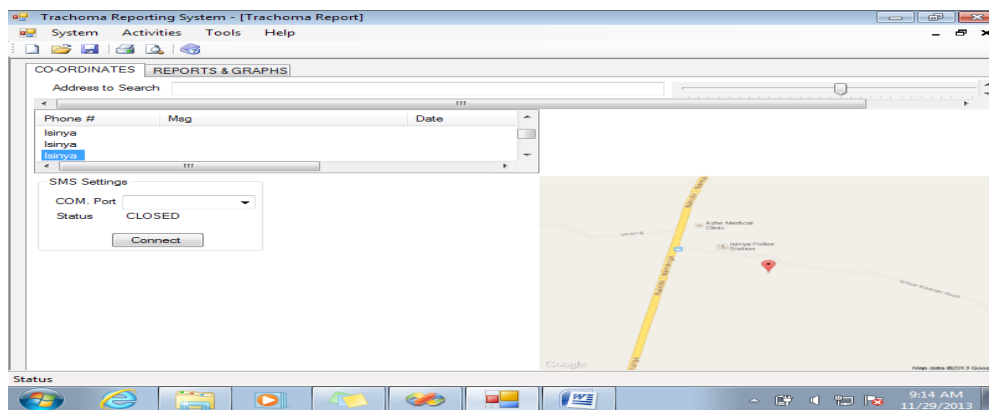


Fig 6b: Visual Map on Trachoma Patients Location

Source: Author

Conclusion

Mobile data collection method has been proved to be more efficient in capturing data than using paper forms which is error prone and extremely inefficient. It has provided consistent input of data from all the community health workers mobile phones which means that data is collated easily and value summarised reports generated. These reports can help in decision making on trachoma patients.

The paper focused on the use of GIS mobile technologies to improve data collection and reporting process of Trachoma patients. The system was developed and tested to see the applicability and usability of the available mobile technologies in improving the reporting process. The evaluation phase showed that the GIS system is very efficient as compared to the manual data collection method that was used to report those infected with Trachoma within Kajiado County.

The current practice of collecting trachoma patients' data is through paper-based methods where physical books are filled with data and collected manually. The transcription of data for analysis is difficult and compromises the integrity of data especially when the data volume is large. Furthermore, the supervision of data collection from multiple locations is difficult and leads to large time lag for data to be available for usage by the AMREF coordinators.

With the developed trachoma system, data transcription has been simplified as data is fed directly to the system by using mobile phones. Therefore, human data transcription errors are minimised and there is an increase in data accuracy. The use of mobile phones for data collection has enhanced uniformity of data formats and increased coordination and reporting of trachoma patients.

Experience during the study revealed that mobile based phone which is GIS enabled provided faster, standardised and shareable data for critical decision making. Therefore, the system should be adopted to replace the current manual paper based way of reporting patients infected with Trachoma by community health worker.

Recommendations

Based on the results of this research, it is recommended that the system be upgraded to show relationships between the patterns and trends of trachoma in the form of maps. This will enable the policy makers to see the depth of trachoma infection at a glance in a particular location. The study recommends developing of a GIS cloud mobile data collection system for web and mobile devices which would allow collection of data in real time mode, with designed forms, working in offline mode. However, the system may experience the following challenges:

The system requires network so that the patients' data can be posted to the database. This implies that it may not work effectively where there is no network.

It also requires users to have knowledge of the operation of a smart phone so that they can be able to post the data on time. A lack or inadequacy of such skills will limit the effective operations of the system.

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Impact of Cloud-Based Services on Records Management in Public Organisations in Kenya

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Abstract

Cloud-based services are the services that are provided to users through the Internet when they need them. They are designed to provide easy and scalable access to applications, resources and services. Such services include online storage, backup solutions and document collaboration services, among others. Most organisations have started using the cloud-based services to offer efficient and cost-effective technological solutions. Other organisations are moving to cloud-based records management to cut cost, eradicate redundancies and pool resources. However, when choosing to use these services, the organisations have to weigh against the risks associated with lack of privacy and security of records. This chapter analyses the cloud-based services used for records management in public organisations in Kenya; their impact on effective records management; the challenges in managing the cloud-based services; and strategies which can be used by the organisations to enhance the effective adoption of cloud-based services for records management in public organisations in Kenya. The chapter is based on a research study where primary data were collected through self-administered questionnaires using the online Survey Monkey platform. Additional information was collected through review of scholarly materials. The findings indicate that public organisations in Kenya can use cloud-based services to enhance their records management. Thus, cloud-based services such as creation, digitisation, dissemination, storage and preservation of records have the potential of increasing efficiency and effectiveness of public organisations by enhancing effective records management. The findings here can be used by public organisations to implement effective records management initiatives anchored on cloud-based services. Moreover, the findings can be used to develop policies and standards governing the use of cloud-based services in records management.

Keywords: *Cloud-based services, records management, public organisations, Kenya*

Introduction

According to Kaufman (2009), cloud computing is the ability to utilise accessible, distributed computing environments within the limits of the Internet from anywhere. Kuo (2011) also explains that cloud computing is the new technology in delivering computing services and resources. Nonetheless, it is important to point out that cloud computing is not necessarily a new technology; it is a new model used to assist delivery of computer services and resources. As a records management solution, Cloud computing offers records managers; facilitation of fast delivery of information and also provides huge space for the storage of records. Other advantages associated with cloud computing for records management include cost saving, enhanced accessibility, better centralisation, increased flexibility, having access to records even in time of disaster, and improved interaction with the user community. Another important benefit of cloud-based services is its capacity to facilitate remote access to records regardless of the physical location of the users. However, it also has some disadvantages which include challenges associated with poor security, questionable data integrity, unclear ownership and control, difficulty meeting legal compliance as well as irregular retention and disposal management.

Public organisations have started to use cloud-based services because of the potential benefits of the services. These benefits, however, should be weighed against the risks associated with the privacy and security of records. This is because the records migrated to cloud spaces should continue to be usable, and, when necessary, securely destroyed or transferred while at the same time retain their reliability, authenticity and integrity. Consequently, public organisations moving records to cloud spaces should develop requisite policies to guide the use and protection of their records. Furthermore, organisations should not just migrate to cloud-based services just because their contemporaries are doing the same. The decision to use cloud-based services should be informed by a systematic analysis of its benefits to the organisation and not mere imitation to keep with the trends.

Rationale of Cloud Based Services

Records management is the orderly control of an organisation's records from the time they are created and encompasses their maintenance, use and disposal. For many years, public organisations in Kenya have relied on paper-based records to deliver their services. Over time these paper records grew in size and complexity making them generally inaccessible and unusable. Indeed, the volume of records in most public organisations is so vast that many records managers have to fight for storage

space, whether physical or digital storage, as storage space continues to shrink and volume of records continue to grow. This has led to public organisations having to prioritise records to store in the available physical spaces in an effort to keep the costs associated with storage low. This dilemma has focused attention on cloud-based services as a possible solution.

Many public organisations in Kenya are adopting cloud-based services without considering the impact. According to Kachwanya (2011) cloud-based services can complicate issues relating to the security of records. This is because the cloud does not necessarily offer security agreement to end users. Therefore, it is upon the organisation to secure its own records, perhaps through encryption. In addition, most organisations do not understand what cloud computing entails hence they end up not using it. For instance, Microsoft started offering cloud services in Kenya but stopped because of low uptake. Also the fear of job loss by many employees in public organisations has hampered the adoption of cloud-based services. This chapter has analysed the cloud-based services used for records management in public organisations in Kenya; their impact on effective records management; the challenges of managing the cloud-based services; and strategies which can be used by the organisations to enhance the effective adoption of cloud-based services for records management in public organisations in Kenya.

Theoretical Framework

The study informing this chapter was based on the records life cycle model. This is a records management model that offers insight on how records are managed from creation to disposal. The model was developed by Phillip Coolidge Brooks and Emmett Leahy of the US National Archives in the late 1930s. It was further advanced by Ira Penn. Richard (2005) asserts that records life cycle are the stages that records follow in their life span. It is believed that records are born; they live and also die. Therefore, the management of records life cycle entails creation, storage, retention, preservation, disposal and archival of records. The first stage of the records life cycle is creation. This involves records being created or received through daily transactions of the organisation. They should be captured well to ensure easy and authorised access. After the records have been created they should be organised, maintained, and stored in secure locations. With time the use of records reduces hence the need to dispose them. This can be done through the destruction or archiving.

The use of cloud-based services should facilitate the effective transition of records through the life cycle. Therefore, an assessment of the impact of cloud-based services on records management is essentially an assessment of the impact of these services on the records life cycle. Consequently, the model was used to provide the framework of this assessment. Similarly, the effectiveness of cloud-based services in enhancing records management in public organisations was assessed based on how well the services facilitated seamless transition between the various stages of the life cycle.

Methodology

The study culminating to this chapter was designed as an exploratory research because the concept of cloud computing in records management is relatively new to most of public organisations in Kenya. Exploratory research is conducted for research topics that have not been well defined. It assists to explore the research questions of the existing problem (Shields & Rangarjan, 2013). It is conducted to define the extent of the problem and usually not anticipated to give definite evidence. Saunders *et al.* (2007) advise that when piloting exploratory research one needs to be prepared to adjust their concept due to exposure to new information and records.

Primary data was collected through key informant interviews with records officers at the Ministry of Lands, Housing and Urban Development headquarters in Nairobi, Kenya. The choice of the ministry was based on the fact that it is one of the public organisations with the largest volumes of records in Kenya. The choice was also based on the fact it has already implemented a project aimed at utilising cloud computing in managing its records. Additional information on the impact of cloud-based services on records management was collected from the relevant literature. The data were analysed using descriptive statistics. This analysis technique was chosen because it enabled the author to summarise, interpret and describe the data in a way that reveals their meanings within the context of the study. The researcher purposively sampled ten (10) records officers from the Ministry of Lands, Housing and Urban Development headquarters in Nairobi, Kenya. The selection was based on an understanding of cloud-based services and their use in the ministry. This was determined by the job roles in the station. The researcher selected officers who were responsible for digital records in the ministry. Of the ten (10), the researchers received filled questionnaires from eight (8). This represented 80% response rate which was acceptable for the study.

Finding and Discussions

Hereunder are the findings of the study on which this chapter is based.

Cloud-Based Services Used for Records Management

Some of the cloud-based services used in records management include:

1. Storage – the cloud can be used for storing the records in a way that makes them accessible anywhere. Some of the cloud-based storage services include use of Dropbox and Google drives. These digital platforms provide large storage space cost-effectively and also enhance the access of records remotely.
2. File sharing – the cloud-based services, being digital, facilitate the effective sharing of records with authorised users online. So with the click of a button a records officer is able to select and share files or sections thereof with users in a convenient and fast manner.
3. Digitisation and dissemination of records – for records to be on the cloud, they need to be migrated to digital format first. After they are digitised they can be disseminated by use of the cloud-based service such as Google apps. Dissemination can also be done by the use of instant messaging or mail services.
4. Preservation – cloud-based services facilitate long lasting preservation of records. This is because the records stored in the cloud are digital and are not prone to wear and tear.
5. Creation of records – the cloud offers a platform for the creation of records. For example, Google docs can be used to create and save records for later use.

Benefits of Cloud-Based Services

The respondents indicated that the benefits of using cloud-based services in records management in public organisations in Kenya include, among others, the following:

1. Cloud-based services save on transmission time of the records hence expedites the decision making process in the public institutions. This is a critical benefit given the records instigated challenges that most public institutions in Kenya face which result in delayed service delivery.
2. The services also increase efficiency and effectiveness in service delivery as technology is highly used in capturing, managing and processing of records as compared to a case where systems are running manually.

3. Cloud-based services offer public organisations vast storage space. This benefit enables the organisations to save on the physical storage space, which is getting expensive in most contexts, and to maximise the use of the available space.
4. Cloud-based services also facilitate the realisation of multi-user access to records thereby enabling ready access to records and real-time collaboration in decision making and task performance. Also the records can be accessed outside traditional office environment.
5. Cloud-based services help preserve records in digital format hence increase their longevity by reducing wear and tear. These two are the most common causes of records deterioration.
6. They lower operational costs by eliminating the costs associated with buying of hardware and software. This is because, for instance, if the organisation needs to buy a server to store its digital records, this associated cost can be avoided by storing the records online using Google drive.
7. Cloud-based services also enhance the integrity of records compared to physical records which can be lost, amended or mutilated easily. Digital records stored in the clouds will stay usable for longer and around the clock thus supporting timely decision making and service delivery.

Challenges of Using Cloud-Based Services for Records Management in Public Institutions

The findings of the study indicate that public institutions in Kenya face the following challenges in their efforts to deploy cloud-based services for records management:

1. Retention schedules - The records in the cloud may be saved using the services from several different service providers hence creating a challenge when trying to figure out how long a record can be retained in an organisation. This requires the organisation signing a memorandum with the service providers to safeguard their role in determining records retention requirements.

2. Lack of capabilities to implement records disposal schedules – Since the records are stored in the cloud, organisations face challenges when attempting to delete records permanently or transferring them to the archives. This is because the cloud offers a wide range of storage options which can be used to revive records against the will of the creating organisation.
3. Trustworthiness and sustainability of records – Most cloud platforms at the moment do not have practical standards governing how records are stored and manipulated. This creates a loophole which may be exploited by unscrupulous persons to abuse the records.
4. Preservation – When records have been deemed to be of enduring value the cloud does not have articulated ways of continuous special storage of such records or a means to access them. Furthermore, there are no contingency measures for continued preservation should the service provider change.
5. Privacy and unauthorised access – Any records saved in the public cloud can be accessed by unauthorised persons. This means that such records will remain vulnerable to malicious manipulation.
6. Resistance to change – Many organisations are facing challenges with employees resisting the change to digital world. Apart from the need for new skills, many of the employees fear they might lose their jobs with the shift to cloud computing.

The findings above demonstrate that cloud-based services have a great potential of helping public organisations to meet the needs of their stakeholders efficiently, cost-effectively, promptly and consistently. However, public organisations have to overcome myriad challenges to use the cloud-based services effectively.

Conclusion

The decision to adopt cloud-based services for records management by public organisations is influenced by their potential benefits in improving the efficiency and effectiveness of records management. Many organisations are already using these services for storage, file sharing, digitisation and dissemination of records. These organisations have reaped benefits relating to reduced costs, enhanced records access and improved service delivery to their stakeholders. In spite of these benefits, there are myriad challenges which hamper the effective adoption of cloud-based services in public organisations in Kenya. Organisations seeking to embrace cloud-based services need to attend to these challenges to ensure better returns. They can do this by developing the right policies, training and investing in good bandwidth. The organisations continue to be drawn to the cloud-based services because of their potential benefits which are getting more attractive every day.

The findings of this study can be used by public organisations to develop policies governing the use of cloud-based services for records management. They can also be used by relevant training institutions to develop records management curricula to respond to the needs of the digital era organisations. The findings can also be used to create awareness about the benefits of cloud-based services for records management in public organisations in Kenya.

Recommendations

The respondents reported that public organisations are exploring the option of using cloud-based services for records management. The Ministry of Lands, Housing and Urban Development is one of these public organisations which are currently digitising their records with the view of reducing the need for physical spaces to store paper-based records and also to facilitate fast access and service delivery. The findings indicate that although they are facing myriad challenges, the organisations are determined to harness the benefits of cloud-based services. The respondents suggested the following actions to help in this effort:

1. Involve the top management of the organisation in planning and deployment of the cloud-based services. This will make the management to understand the need for cloud services and their potential impact on the performance of the organisation.

2. The organisation should clarify if the records in the cloud are covered under the existing records retention schedule. This will help determine how long the records are to be retained in the organisation's space in the cloud.
3. The organisation should provide guidelines on how records should be migrated so that they are comprehensive throughout the various stages in their lifecycle.
4. Public organisations should develop policies and guidelines to enhance good record management practices in the cloud.
5. The organisations should also invest in the training of the current staff on the management of cloud-services. This will enhance the success levels of the projects. It would also reassure doubtful staff that they would still be retained in the organisation albeit with new skills and responsibilities.
6. As much as cloud-based services do not require a lot of infrastructural investments, certain ICT requirements are essential for the successful adoption of the system. For example public organisations must invest in stable internet connections to enable access to cloud services.

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Implementation of Electronic Document and Records Management System in the Public Sector in Kenya

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Abstract

Many public sector organisations in Africa have embarked on reforms aimed at streamlining operations and service delivery to the citizens. However, despite the tremendous efforts and resources allocated to reforms, little progress has been made. One of the areas lagging behind is records management. Whereas several public organisations have deployed Electronic Document and Records Management Systems (EDRMS), these have neither transformed operations nor enhanced service delivery. This scenario is unlike the case in developed countries where digitalisation of records management processes has yielded significant benefits. The challenge is the implementation of EDRMS projects by public organisations in Kenya. This chapter presents results from a study conducted to investigate the implementation of EDRMS projects at the then Ministry of Higher Education, Science and Technology in Kenya. The objectives of the study were to establish whether there was a policy framework guiding the implementation process; whether the user needs were met; the benefits of using EDRMS; the challenges hampering the effective implementation of the EDRMS; and make recommendations to enhance the implementation of EDRMS projects in public organisations. Data were collected from 52 respondents using questionnaires and face-to-face interviews. Qualitative and quantitative approaches were used to analyse, present and interpret data. The study found that most public institutions have a relevant policy framework guiding the implementation EDRMS projects. However, many of their human resource are either unaware of or do not apply these policies. The needs of the users of EDRMS systems in public institutions are neither analysed not met by the systems. If implemented appropriately, EDRMS systems have the potential to streamline business operations and enhance decision making in public institutions.

Keywords: *Electronic records; electronic documents management; public organisations, Kenya*

Introduction

There has been a rapid growth in digital information in the public sector lately. This has necessitated the need for comprehensive information management systems such as electronic document and records management system (EDRMS). An electronic document and records management system is an automated, electronic document and records management system that enables organisations to manage unstructured information captured in paper and electronic formats. These include emails, word-processed documents and spreadsheets (Commonwealth of Australia, 2011). Another important feature of EDRMSs is that they enable desktop access to information across an organisation and make provisions for security, access, version control and audit functionalities which are required as components of best practice in modern information management processes.

According to the National Archives of Australia, an organisation gains a lot of benefits from implementing an EDRMS. Some of the benefits include improved information management capabilities by providing a central store for employees to capture their electronic records and information rather than in uncontrolled portable drives; better retrieval of information; improved security of recorded information; reduced reliance on analogue records; and reduced need for office storage space thus saving on related costs. Zinner *et al.* (2008) observe that despite the many benefits organisations accrue by adopting and implementing EDRMSs, there is limited implementation of these systems in government and non-governmental organisations due to inadequate training, poorly designed user interfaces, resistance to change, and lack of top level management support, among others. The purpose of this study was to investigate the implementation of EDRMS in the public sector in Kenya using a case study of the then Ministry of Higher Education Science and Technology.

Rationale of the Study

In the recent past, EDRMS technology has had a tremendous influence on the management of records. Several studies have been conducted on electronic records management elsewhere in the world including Malaysia, Singapore, Canada, and Australia. However, most of the studies have been conducted in the developed world and have focused generally on electronic records management. The main issues raised in these studies have largely revolved around retention, disposal and security of electronic records. The author is not aware of any comprehensive study on the implementation of EDRMSs in the public sector in Kenya. This is in spite of the fact that many public

sector organisations in Kenya have been implementing EDRMSs lately. These organisations are at risk of repeating mistakes that other organisations which implemented EDRMSs before them had made because no study has been conducted to unravel these. The current study sought to fill this knowledge gap. It investigated the implementation of EDRMSs by public sector organisations in Kenya using a case study of the then Ministry of Higher Education, Science and Technology (MOHEST). The objectives were to establish whether there was a policy framework guiding the implementation process; whether the user needs were met; the benefits of using EDRMS; the challenges hampering the effective implementation of the EDRMS; and make recommendations to enhance the implementation of EDRMS projects in public organisations.

Methodology

The research, resulting into this chapter, was designed as a case study so as to generate detailed findings on the research questions. The MOHEST was chosen because it is one of the ministries which have taken serious steps to manage their records professionally. This is exemplified by the fact that it is one of the ministries using EDRMS technology for records management. The study population comprised records managers, clerical officers, information technology staff and heads of departments. This population consisted of 52 persons. Because of the low number, the researcher used the entire population as informed by Leedy (1997) who argues that there is no point in sampling populations that are less than 100. Of the 52 people, 43 were records officers while 9 were heads of department. Questionnaires were used to collect data from the 43 records officers while interview schedules were used to collect data from the 9 departmental heads. The choice of the data collection tools was based on their suitability to gather comprehensive data so as to ensure the validity of the findings. The collected data was analysed using descriptive statistics.

Findings and Discussions

The response rate for the study was quite high with 93% (40 out of 43) of the records officers completing and returning the questionnaires. Similarly, 67% (6 out of 9) of the departmental heads were interviewed as the other three were held up with official duties thus making it difficult for them to be interviewed. This response rate was adequate for the statistical analysis.

Distribution of Respondents by Background Characteristics

A total of 88% (46 out of 52) of the respondents participated in the study, as explained above. The respondents were asked about their highest level of education. In response, 2.2% (1 out of 46) said Kenya Certificate of Secondary Education; 13% (6 out of 46) indicated that they have a professional certificate, 56.5% (26 out of 46) were diploma holders, while 26.1% (12 out of 46) were degree holders. The findings imply that majority of staff at MOHEST were diploma holders. This concurs with the general distribution in most public organisations in Kenya in which the majority of the work force are diploma holders.

In terms of gender, majority (74%) of the respondents were male while the rest were female. The respondents were asked how long they had worked with MoHEST. Forty one per cent (19 out of 46) reported they had worked at MOHEST for between two to six years; 50% indicated that they had been there for six to ten years; 7% have worked with MOHEST for a period between 10 to 14 years; and 2% having worked for over 14 years. These findings indicate that the majority (55%) had worked for MOHEST for more than six years. From this finding, it can be argued that they were able to respond to the research questions competently given their years of service at the ministry.

On the areas of specialisation, 83% of the respondents indicated they have been trained in archives and records management while rest have been trained in other disciplines.

Records Management Policy

The study established that MOHEST has a records management policy. This policy offers guidance to ensure that MOHEST records, especially those that are required for compliance with the law, are retained in a usable state for a sufficient period of time. In addition, the policy ensures that both paper and electronic records are preserved. It provides a framework and assigns responsibilities for ensuring that full and accurate records of the transactions of MOHEST are created, maintained, accessed and disposed off in a controlled manner. The policy also ensures that records are maintained for as long as they are required to support operational, legal, audit or cultural needs, until their disposal in accordance with an authorised disposal schedule.

The respondents were asked whether they were aware of the existence of the records management policy at MOHEST. A majority (59%) of respondents said that they were not aware of the existence of the records management policy; 35% reported an awareness of a records management policy while

6% said that MOHEST did not have a records management policy. It can therefore be inferred that staff sensitisation on the records management policy is key to the implementation of the policy. This is to ensure that the policies and procedures have been adopted and used across MOHEST. The findings indicated a gap in the sensitisation of the policy as 73% reported that the sensitisation was not conducted comprehensively.

These findings imply that majority of the respondents were unaware of the existence of a records management policy in MOHEST. This could mean that majority of employees are not directly applying the letter and spirit of the policy. Thus, the effectiveness of the records management policy is greatly reduced. Unless, the staff are made aware of the existence of the policy and understand its content, it cannot be effective in streamlining records management operations in the organisation.

Implementation and user needs assessment

User needs analysis is a crucial step in the implementation of any system in an organisation. It helps in capturing the needs of the users and analysing them appropriately. The respondents were asked whether a user needs analysis was conducted before the EDRMS was introduced at MOHEST. Fifty per cent of the respondents indicated that a user needs was not conducted; 43% reported that it was somehow done; while 7% revealed that it was properly done.

These findings indicate that there is a possibility that no meaningful user needs assessment was conducted before the EDRMS was introduced at MOHEST. This could possibly imply that the implemented EDRMS may not have been effective in meeting the user needs. This was a major omission because a system which is not tailored to the needs of the users runs the risk of being irrelevant. It also means that the ministry acquired the system by faith that it will somehow be usable. This approach is common in public institutions where systems are introduced without first confirming its need through a comprehensive user needs assessment.

Implementation of EDRMS

The main objective of the pre-installation phase is to set a firm foundation upon which the system will be operationalised and to provide guidelines to ensure that the subsequent phases of the project (installation, customisation and configuration) of the system, does not only meet the business needs of an organisation but also adheres to the established tenets of professionalism

and best practices in records management. The respondents were asked whether the implementation of the EDRMS was done in phases so as to give the users time to assess and get used to the system. 33% of the respondents said that the implementation was done in phases while 67% reported that it was implemented at once making it difficult for them to adjust with the new system.

The findings indicate that the system was introduced wholesome. This approach is disruptive and often leads to systemic failures. Given that there was no evidence of a comprehensive user needs assessment, a phased approach would have been best in helping the staff to learn how to use the system and transit from the former system. This approach may have compromised the usability of the system. Similarly, it may have steeped the learning curve for the staff who may have resented it. The best practice in systems implementation is the use of a phased approach which ensures that operations continue to run while the new system is being installed, configured and tested. A phased approach also gives the users an opportunity to learn the system as they use it.

User training

Training enables users to understand how the system operates. Most EDRMS projects fail due to insufficient training given to the users. User training is fundamental in determining the success of EDRMS projects. Organisations need to invest a lot of resources in training and building users' capacity on systems being implemented.

The respondents were asked whether they were trained on the use of EDRMS. A majority (83%) of the respondents reported that they were trained to a small extent; 11% to a large extent; 4% to a very small extent; while 2% said that no training was done at all. Most of the respondents indicated that they were only trained at the very initial stages when the system was being introduced, and then no further training was done afterwards. In fact a majority of them admitted having forgotten their passwords and usernames to log on to the system.

Staff understanding of EDRMS

It is a good initiative to have all users to understand the system that they work with to enable them conduct their duties effectively using these technologies. The respondents were asked whether the staff understand the EDRMS: 57% of the respondents reported that the staff understand the EDRMS to a small extent; 41% to a very small extent; whereas 2% reported that they do not

understand anything about the EDRMS at all. These statistics clearly reveal that there is a gap on training of the users on what the EDRMS is all about and how it works.

Users' opinion on satisfaction with EDRMS

The respondents were asked to describe their opinion on whether they are satisfied with using EDRMS in MOHEST. This question was asked to gauge whether the EDRMS really satisfies the user needs: 70% of the respondents indicated that they were not satisfied with the EDRMS. On the other hand, 26% of the respondents indicated that they are more or less satisfied with using the EDRMS while only 4% of the respondents reported that they are very satisfied with the system. Based on these findings, it is clear that the users were not satisfied with the system.

The benefits of using EDRMS

An electronic document and records management system is as good as nothing if it is not in operation. There are numerous business opportunities which public organisations can accrue by operationalising the EDRMS. These include gaining business competitive advantage especially in service delivery and enhancing simultaneous access to information by users irrespective regardless of their geographical location. The respondents were asked what the level of operationalisation the EDRMS at MOHEST is at. The majority (91%) of the respondents indicated that it was operationalised to a very small extent; 4% to a small extent; 3% said it has never operated; and 2% indicated it operates to a large extent.

Challenges facing the implementation of the EDRMS

There are numerous of challenges that can affect the implementation of EDRMS in public organisations. Some of these challenges include the choice of the software that would meet the organisations' business needs and integrate them with the core business of the organisation. As much as there are challenges, there needs to be solutions to curb them in order for the system to be implemented successfully. Eleven per cent of the respondents reported that there is inadequate finance; 39% of the respondents reported that inadequate technical expertise posed a challenge in implementing; 30% indicated resistance to change; while 20% of the respondents indicated that inadequate documentation is the challenge facing the implementation of the EDRMS. Thus the main challenges are resistance to change and inadequate technical expertise (69%). These can be addressed through taking the users through training on change management and function of the system.

Duration of addressing challenges

The duration of time taken to address the identified challenges is significant to the system users. Many system users lose concentration and interest if the duration taken to address the challenges is long. The respondents were asked how long it takes for the above challenges to be addressed. A majority (98%) of them reported that it takes more than a week for the challenges to be addressed whereas 2% of the respondents did not respond. They further reported that none of the challenges mentioned earlier have been addressed.

Conclusion

The study found that MOEST have a relevant policy framework guiding the implementation EDRMS projects. However, many of their staff are either unaware of or do not apply these policies. The needs of the users of EDRMS systems in public institutions are neither analysed nor met by the systems. If implemented appropriately, EDRMS systems have the potential to streamline business operations and enhance decision making in public institutions. Most of the challenges which hamper the effective implementation and use of EDRMS systems in public institutions can easily be addressed so as to enhance their usability and impact.

Recommendations

To enhance the effectiveness of EDRMS implementation, the study recommends the following:

Develop a records management policy

Public institutions should develop a records management policy and have it endorsed by the top level management before cascading it to the employees. The policy helps to develop and implement best practices for electronic records creation, management and preservation. It also ensures that records created by public institutions have relevant content, context and format and that they are accurate, timely and under control.

Training on electronic records management systems and change management

Providing appropriate training is essential for change management and securing end user acceptance and buy-in. A training plan should be developed early in the project. This aids the project team to understand the training needs for all levels of staff; tailor training to target specific needs of individual business areas; and provide resources required to implement the training plan.

Provision of adequate documentation / system manual to the users

The findings of the study revealed that there is inadequate documentation available for the users. Therefore, provision of adequate documentation about the system enables the system users to be conversant with how the system works.

Invest in technical expertise to support system implementation

Public institutions should invest in technical experts to support system the system implementation process. Inadequate expertise was among the major challenges facing the implementation of EDRMS. Therefore public institutions should train their staff in order for them to acquire the necessary technical skills on the system.

Provision of adequate finances

Public institutions should have a dedicated budget for the records management unit to support its activities. The study revealed that there are inadequate financial resources allocated to the records management unit. IRMT (2009) advocates that it is imperative that provisions be made in the annual estimates of capital and running costs for sufficient funds to enable the records and archives departmental units to perform their functions properly.

Adopt DIRKS methodology framework to implement the EDRMS in public institutions

The DIRKS methodology is an 8-step process designed to assist organisations to improve their management of records and information. The steps are: preliminary investigation; analysis of business activity; identification of record keeping requirements; assessment of existing systems; identification of strategies for records keeping; design of a record keeping system; implementation of records management system; and post-implementation review. It provides the foundation for good record keeping. Public institutions should adopt the methodology to enable them to successfully implement EDRMS projects.

Practical Implications of the Findings

The study findings can be used by both public and private sector organisations to strengthen EDRMS implementation strategies by emphasising the management of electronic records as a vital component in scaling up efficiency and effectiveness in service delivery by organisations. The study findings can also enlighten the EDRMS stakeholders on the need to effectively implement electronic records and document management projects. The research contributes to the body of knowledge on implementing electronic records management system and informs the key steps on implementing EDRMS; development of records policy; as an integral part of effectively implementing an EDRMS project in the public sector.

The findings can also be used by learning institutions training records managers and archivists and other information professionals to develop appropriate curricula capable of developing the essential competencies on implementing EDRM system projects.

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Local Content Management in Kenya Methodist University (KEMU)

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Abstract

This chapter is informed by a research study conducted to investigate the development of an effective and efficient local content management framework for Kenya Methodist University (KeMU). The objectives of the study included: to establish the types of local content at KeMU; establish the challenges that affect content management; and develop a framework for management of local content for KeMU. Survey method was applied and samples were drawn from heads of programmes, librarians, students and lecturers. The Deputy Vice-Chancellor-Academic Affairs, the University Librarian and Information Communication Technology (ICT) Director were included as key informants. In-depth interviews were carried out and questionnaires used on students. The results show that there existed several types of local content at KeMU but there lacked a local content management policy. There were undocumented procedures, ad hoc collection methods and uncoordinated management of various types of local content as only past-papers were electronically managed. The study has developed and presents a framework for local content management at KeMU that can be applied by other institutions of learning and research.

Keywords: *Local content, institutional repositories, KeMU, knowledge management, Kenya*

Introduction

According to Atnafu (2005), local content is content that reflects the language, the culture, and the real life of a locality or a country. He attests that any information that can be localised (made linguistically and culturally appropriate to a target locale) qualifies to be local content. Bruegge *et al.* (2011:4) in giving recognition to local content notes that:

“The content that is most important to people is typically in their own language and is relevant to the communities in which they live and work. These communities may be defined by their location, culture, language, religion, ethnicity or area of interest and individuals may belong to many communities at the same time. Further, communities evolve so what is relevant will change over time. This relevant content is often referred to as ‘local content’. The term community is used in a broad way to include not only local professional communities (public and private), but also non-professional content creators and users”.

Most academic institutions do not have specific repositories for locally produced content instead they consider only content that is academic. These include theses and dissertations, research papers, technical papers and electronic books that the university has rights to or have been donated as content for institutional repository. The idea that a university repository should contain content for the local community rather than from the local community is emphasised by the Digital Content Landscape Model that presents both locally produced and globally sourced content as digital assets of a university (Conway, 2008).

Tjiek (2005) notes that local e-content management provides an opportunity for documentation of locally produced content and gives the digital library system, ‘DesaInformasi’, developed for Petra Christian University as an example that has been very beneficial to various academic departments and non-academic units which had struggled to find some kind of documentation systems for their locally produced works or resources.

In the case of Kenya Methodist University (KeMU) as a community, this chapter considers local content in the university setting to be the expression of any knowledge owned and adapted by the KeMU community members; lecturers, non-teaching staff, researchers, administrators, students and various groups, societies, associations and clubs of members of the university community.

KeMU is a private university sponsored by the Methodist Church in Kenya. It has campuses in Nairobi, Nakuru, Nyeri and Mombasa. It offers certificate, diploma, bachelor's, master's and doctoral studies in several courses managed by the School of Business and Economics, School of Medicine and Health Sciences, School of Science and Technology and School of Education and Social Sciences. It has a population of over 12,000 students. Its library is automated and uses Koha integrated library management system. The digital library services include e-journals, information literacy, e-books, website creation, updating and maintenance.

The Problem Statement

KeMU, like the other universities in Kenya, is equally affected by the inadequate expertise and experience needed in the management of local content. ICTs, although yet to be fully utilised, have been used to push foreign content towards the locals and in effect diminishing visibility and accessibility of local content instead of assisting in promoting the expression of locally adapted knowledge. Although local content is available, its identification, capturing, processing and dissemination are below par compared to foreign content. Information materials that were externally sourced were easily identifiable, processed and disseminated while most of local content types were not available for access, retrieval and use in the library. This has led to inapplicability of research findings to local problems because information sources, theories and concepts that inform studies are derived from foreign content that is that is out of touch with local problems.

Local solutions on the other hand remain inaccessible for use and application as they are not given priority they deserve. KeMU library, for example, had a website where researchers and students could access online journals but most of the journals were managed by publishers in the developed countries whereas there were no links to locally published journals. No study had been conducted to assess the efficiency and effectiveness of management of locally owned and adapted knowledge.

Literature Review

Yu (2005) and Warren (2001) consider Content Management (CM) as a process of collecting, organising, categorising and structuring informational resources of any type and format so that they can be saved, retrieved, published, updated and re-purposed or reused in any way desirable. These CM processes as presented by Yu (2005) require a content management system that has all

the features to meet these processes. Effective content management should include consistent and reliable methods to identify requirements, manage authoritative sources of information, and assemble content on-demand to meet customer needs. Content management can also help content authors and site managers to organise, control, and direct information.

The idea that a university repository should contain content for the local community other than from the local community is emphasised by the digital content landscape model that presents both locally produced and globally sourced content as digital assets of a university (Conway, 2007). Regardless of the contents of an institutional repository, Yearwood-Jackman (2009) gives the following as the management activities involved:

- Developing an Institutional Repository (IR) from scratch
- Embedding an IR in the research management processes
- Managing content after it has been deposited in the IR
- Integrating an IR into the research management systems and business processes of an institution

Cohen and Schmidle (2007) give three priorities considered in identifying content at the Cornell University's Catherwood Library in. These priorities are: firstly, any material (scholarly articles and congressional testimony) emanating from the university (resident and extension); secondly, scholarly material published or produced by the university; and lastly non-university-produced documents.

Related to last priority is a Digital Repository Submission Agreement that offers non-locally produced content a place in the repository as long as the contributors agree with the submission agreement (Cohen & Schmidle, 2007). For this to work, the policy should be clear on the definition of local content and what needs to be done to consider content submitted by non-members of the university community as local content. Genoni (2004:301) in considering the motivation for institutional repositories states that: "faculty considers institutional repositories to be particularly well-suited for various types of grey literature and other fugitive and unpublished material". These materials include: preprints; working papers; theses and dissertations; research and technical reports; conference proceedings; newsletters and bulletins; grant applications; status reports; committee reports and memoranda; statistical reports; technical documentation; and surveys.

International Institute for Communication and Development (IICD) and Tanzania Commission for Science and Technology project came up with Global vs. Local Content Expression and Application Grid (Figure 1). It is a simple grid comprising two axes to distinguish between the expression and application of content. Each has a global and local end.

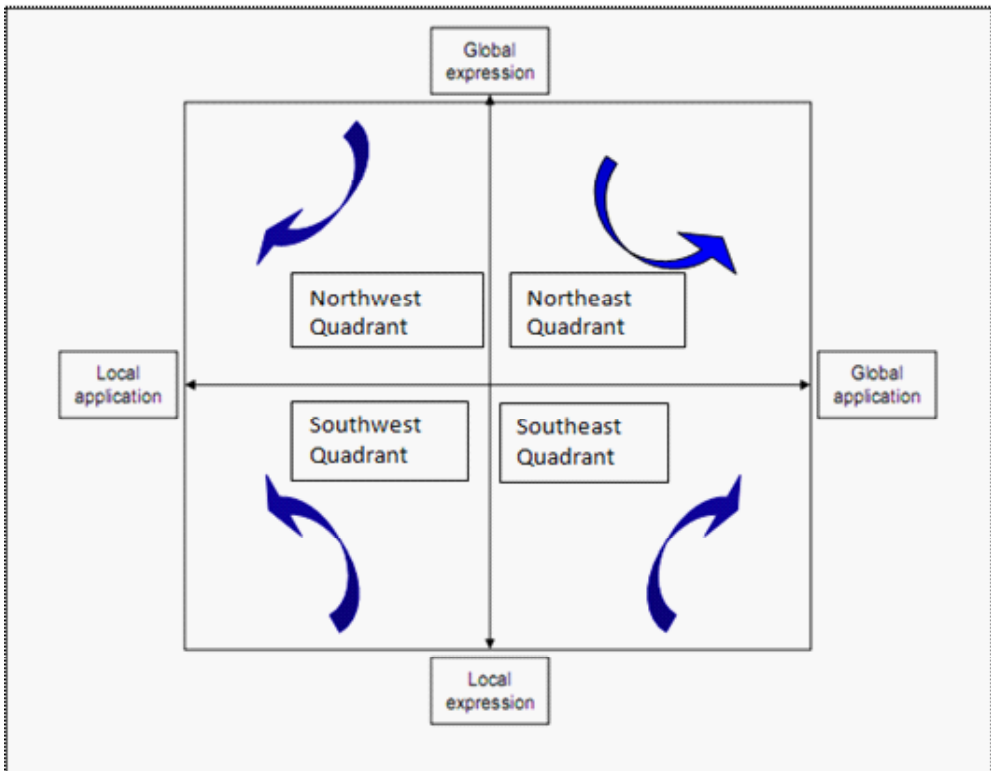


Figure 1: Global vs. Local Content Expression and Application Grid

Source: Ballantyne (2002)

Universities are affected by the Northeast quadrant by way of availability of open access journals on the Internet, international search engines such as Google and Yahoo! The fact that the content within these sources is meant for global users and international application, reveals the role of the library in enhancing the use of global content through provision of Internet services and encouraging use of international websites, open source content and search engines.

KeMU subscribes to the Programme for the Enhancement of Research Information (PERI), an initiative of the International Network for the Availability of Scientific Publications (INASP). This programme enables Kenyan institutions of higher learning and research to have access to thousands of scientific journals. KeMU therefore encouraged and played a major role in pushing the global content to the local university community.

The locally owned content should be created, preserved/processed, and disseminated (UNESCO, 2011) in a manner that the university community can use. The university's role is to produce and disseminate knowledge (Badat, 2009) in the society and being so it produces a lot of content both electronically and manually. The knowledge produced falls in the Southwest quadrant and can be referred to as local content as it is the expression of the locally owned knowledge. This knowledge can, however, be disseminated within the local community context and the global context thus it can also fall in the Southeast quadrant. These two quadrants reveal that local content is not only content for the local community but also content from the local community. KeMU generates knowledge in both electronic and non-electronic formats but how it is processed and disseminated determines its application.

This model reveals that local content creation (collecting, linking and capturing) is dependent on how well both local and global content is applied to create it. The preservation/processing (collating, recording and organising) and dissemination (packaging, repackaging, marketing and distribution) also determine the application of local content – whether it will be applied/utilised locally or globally. Bruegge *et al.* (2011) concur with this revelation by outlining the steps of local content development as creation, preservation, dissemination and utilisation.

The Extended Conway Content Landscape Model (ECLM) (Figure 2) is a multi-dimensional framework that addresses three outstanding issues with digital asset management in universities. First, the model acknowledges the broader academic mission within which digital content is created, acquired (bought and licensed), managed and preserved, and distributed and used. Second, the model provides for selection processes and priority setting exercises based on the dual perspectives of content creator/stakeholders and content user/stakeholders. Third, the model identifies four digital content property scales that provide an analytical foundation for assigning management priorities to particular classes of digital content (Conway, 2008).

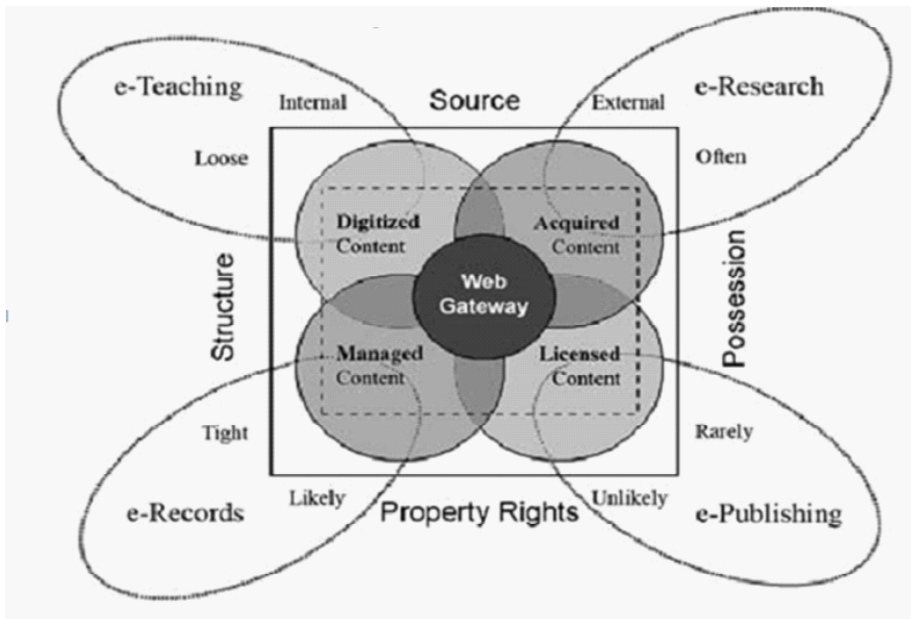


Figure 2: Extended Conway Content Landscape Model

Source: Conway (2007).

This model is a static representation of content of institutional repositories in universities and captures the management activities that are carried out on digital content in universities such as creation, identification, acquisition, preservation and dissemination. This model looks at how e-teaching, e-research, e-records and e-publishing relate with the variables that describe the core digital content management challenges that universities face: property rights, structure, source and possession.

ECLM presents the challenges that are faced by universities in management of digital content (local and global) as an asset. These challenges are: property rights to the digital content for preservation and access; structure of the content that can be tight or loose; source of content can be either local or global; and procession or ownership of content that can be university owned or have licensed access.

Comprising the content is: digitised content that was not born digital it is loose in structure and internally sourced; managed content that is within University's information systems and has property rights and is tightly

structured; licensed content that university has no property rights and has no ownership; and acquired content that the university owns and sourced externally.

A closer look at ECLM reveals the presentation of local content and the major challenges universities face. It can be deduced, from the definition of local content that the half on the left of Extended Conaway Content Landscape represents the local content and the one on the right represents the global content. The left represents content that the university is very likely to have property rights and it is locally sourced. The structure differs as it can be tight/highly structured like the campus publications, faculty publications and university journals and could be loosely structured like lecture notes or individual digital images. Possession is not a challenge when looking at the local content but property rights, source, and structure remain.

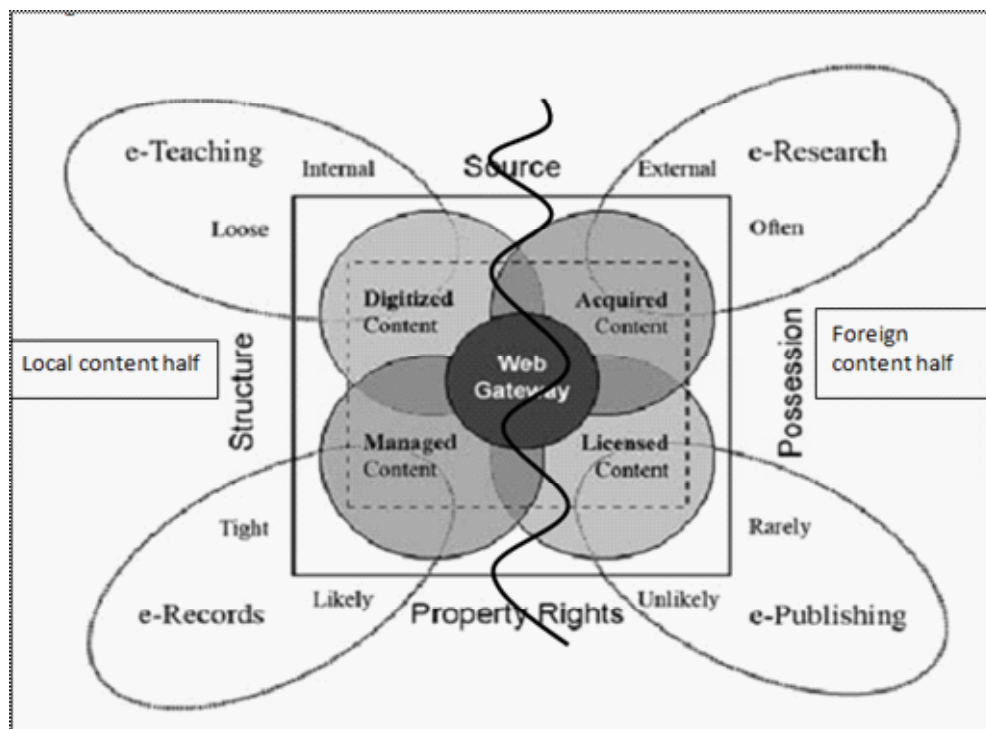


Figure 3: Extended Content Landscape Model Showing the Local Content Half and Foreign Content Half

Methodology

The author applied survey method and triangulated both qualitative and quantitative approaches. From a population of 12,789, five strata were identified: 31 librarians, 12,247 students, 167 lecturers, 10 heads of programmes and three informants. 373 students and 49 lecturers were systematically sampled, 10 librarians (collection development and electronic services librarians) were purposively sampled and census was applied to have all 10 heads of programmes in the sample totaling to 442. The study also depended on the head ICT, Deputy vice Chancellor – Academic Affairs (DVC-AA) and University Librarian as informants.

In-depth interviews were used to collect data from sampled lecturers, librarians, head of programmes and informants while print questionnaires were issued to sampled students at all KeMU campuses. Qualitative and quantitative data analysis techniques were applied.

Seventy nine per cent of the questionnaires were filled and returned while 53% of lecturers were successfully interviewed. All sampled librarians, heads of programmes and the three informants were also interviewed.

Findings and Discussions

The findings of the study are presented and discussed here.

Types of Local Content at KeMU

The study established the following as the types of local content at the university.

1. Lecture notes: materials that lecturers develop to assist them in teaching. They are made available orally, on white board, issued out as handouts, or disseminated via class group emails or to individual student emails. Some lecture notes are also availed to students through the e-learning system.
2. Journals published by KeMU: “International Journal of Professional Practice” (IJPP) accepts papers from within and without KeMU.
3. Research papers: mostly published by other journals apart from the IJPP.
4. Theses and practicum reports: at master’s degree level, project reports at bachelor’s level and practicum reports for industrial attachment.

5. Magazines published by KeMU: "Bits and Bytes" magazine used to be published but at the time of study it was not being published.
6. KeMU websites: KeMU main and library website. The main website presents information on the University in general and has links to other sub-sites such as e-learning, students' management system and the library website. Library website has information about the library and links to online information resources such as e-books, and e-journals. News, pictures and announcements are also made on the website.
7. Official publications by KeMU: brochures, news releases, adverts, calendars and timetables.
8. ODLM manuals: These are information materials written to assist the students in distance learning mode.
9. KeMUSO Publication: Through various clubs, the student organisation had created a lot of content in form of posters, announcements, notices, pictures and webpages. These, too, comprised local content.
10. Past examination papers: managed by the wiki-based past papers management system. They are availed for use via the library website.

The above types of local content fit the definition given by Crow (2002) that local content is scholarly produced, submitted or sponsored by an institutions' faculty (and optionally students) or other agents, non-ephemeral, and licensable in perpetuity.

Local Content management

Past examination papers and theses and dissertations were actively collected by the library and were managed as follows:

- Past papers were uploaded to the past papers management system with the name as course code of the unit followed by its title, the semester and the year the paper was done. Users could view and download past papers as soon as they were uploaded.
- Theses and dissertations were deposited by the originating teaching departments and were classified by an in-house classification scheme that gave a call number showing the department and subject, entered into the Library system and shelved for access.

The use of local content was minimal as compared to that of foreign content. Students mostly used past papers (88%), lecture notes (52%), and KeMU Publications (43%). Local content use took a smaller share of 36% compared with external content (64%). The Internet was the most used source of information and was the reason for more access to foreign content.

The access, retrieval and use of local content depended on awareness of its existence. Very few students were aware of the available local content. Lecturers had authored books and articles that were published but only a few learners (12%) were conversant with their existence.

Retrieval of local content was dependent on whether the material sought was findable. The library was depended upon for books (60%), magazines (20%), and theses and research reports (92%) while past papers (90%) and KeMU official publication (91%) were sourced from the library website. Lecturers were depended upon for lecture notes (100%).

Challenges of Local Content Management

The challenges faced by LCM can be grouped into: policy, technical and social categories.

Policy Related Challenges

These included lack of incentive for KeMU community members to encourage them to publish, inadequate funding for research, priority was given to global content during acquisition of library collection, research and extension department/directorate was less than a year old since it was set up and had not yet developed policies, only one local general Journal (IJPP) that did not attract researchers who would rather publish their work in a specialised journal, lack of coordination between departments leading to conflicting roles management of local content, copyright issues that affected the local published works.

Technical Related Challenges

Technical challenges include inadequate application of ICTs in the management of local content. Apart from the main website and the library website, other departments did not have online presence for their content, only past papers were electronically managed, information/data security was a serious challenge as lecturers, librarians and students perceived ICTs as insecure.

Social Related Challenges

There existed a negative attitude to local content, owners/creators of local content held it close to their hearts and did not want to lose ownership of their work.

Conclusion

While KeMU has local content it needs to develop a local content policy that will guide its management thus bringing to a halt duplication and conflict of roles, neglected types of local content; inaccessible, unaccounted for and unused but important local content. While the library has adequate and well managed collection, it is more of global than local content and needs to put more emphasis on collecting local content. KeMU community should be made more aware of existing local content as this will increase its popularity and use.

Recommendation

Local Content Policy

The authors recommend development of a local content policy given that there were undocumented procedures, ad hoc collection methods and uncoordinated management of various types of local content at KeMU.

The local content policy should be developed by a local content policy committee chaired by the librarian and drawing members from all the teaching, administration and students' departments. This initiative would see all stakeholders' opinions, needs, requirements and even grievances accommodated during policy formulation thereby increasing its acceptability and applicability. The policy should give guidance on the following issues: definition of local content, procedures, incentives for creators, responsibilities of departments, funding and staffing for the local content management, training of users, awareness creation.

Proposed Model

The proposed framework presents local content management as three-part process: creation/collection; management (collation, collection, processing and dissemination); and use/access of local content.

The framework recognises key players, the activities for each part and presents local content management as a spiral continuum that grows from creation/adoption, then management where it is collected, collated and organised into

repository/storage and finally it is availed for access/use. The framework foresees that with accessibility and use of local content, more content is created/collected leading to the management of increased volume of local content thus the outward expansion of the spiral.

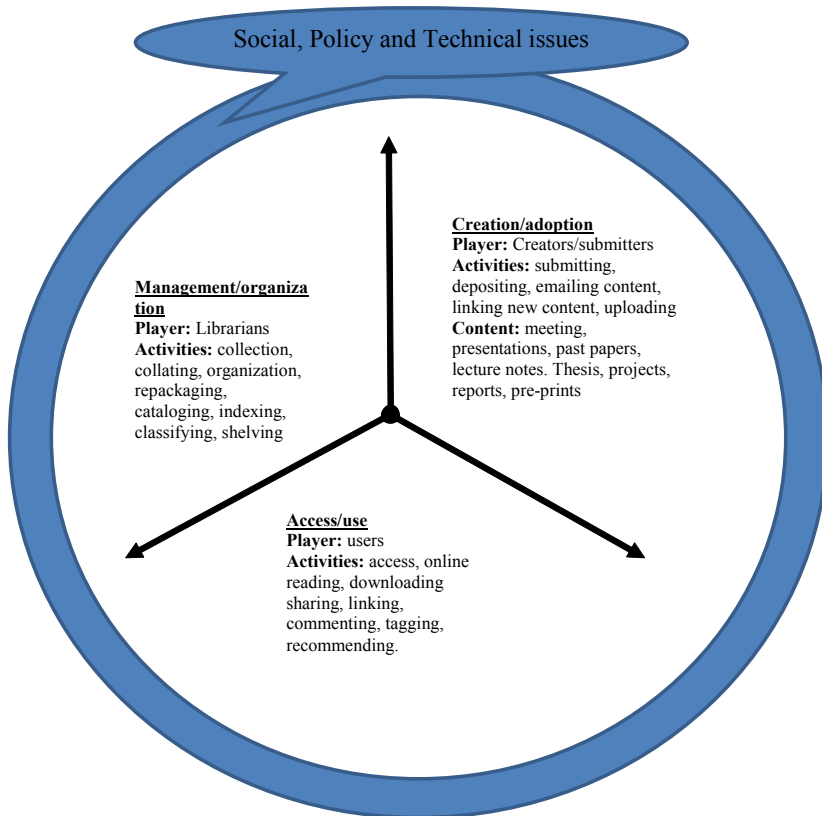


Figure 4: The Proposed Local Content Management Framework for KeMU

Creation/adoption

Local content such as research reports, books, magazines, journals, yearbooks, project and practicum reports, theses and dissertations, lecture notes, past papers, presentations, meetings, websites, blogs, poems, pictures videos, etc., can be created/submitted. Other content can be adopted such as links within blogs, references in research papers and supporting documents for project or practicum reports. Local content can be created or collected in print or digital formats.

Activities in this part include: publishing, updating blogs, websites updates, uploading pictures and videos to Local content repository, submitting research, project or practicum reports to departments, preparation of lecture notes, setting examination papers and so on.

The major player in this part is the creator/submitter. This could be individuals, departments, collaboration or group of persons. The work presented need not belong to the submitter but must be created/collected or adapted by a member of the KeMU community.

Management

Management part presents the collection of the local content, collation, organising and dissemination for the purposes of efficient and effective search and retrieval.

The major players in this part are the librarians. They collect both digital and print local content by requesting creators/submitters to physically deliver, email or submit local content via online links. For print content, librarians can encourage tendering of materials in the library or visit creating departments to collect local content. Organising and collation can be done by applying cataloguing, indexing and classification rules and standards.

Use/Access

Users are the major players in this part. They comprise students and the university staff. Digital local content can be accessed via local content management system, OPAC or library website. Depending on the features of the local content management systems, users can download, link, read online, copy, print, share, tag, comment or recommend local content to other users. For print local content, users can use OPAC to locate the materials from the shelves.

The Environment

The model brings out three major issues in the environment for local content management. These are: 1) Technological such as software, hardware, Internet and computer access, technological knowhow, support for users and administrators, compatibility issues, accessibility, security, user rights and platform versions; 2) Social such as user privacy, beliefs, benefits, individual vs. community ownership, equity in participation, training among similar others; and 3) Policy issues such as funding, staffing, responsibilities of participants and players, content type and procedures.

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Adoption of Cloud Computing at The Technical University of Kenya: Opportunities and Challenges

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Abstract

This chapter emanates from a research study conducted to examine the extent of adoption of cloud computing as well as its associated benefits and challenges at The Technical University of Kenya. The author employed descriptive research. Primary data was collected through interviews and observation of how cloud services were delivered to students. The Technical University of Kenya was picked as a case study because of the need to provide a detailed qualitative data that describe a specific context. The findings revealed that The Technical University of Kenya has set up a private cloud. It also utilises cloud-based services to provide storage capabilities, e-mail services, communication and networking as well as cloud-based social media platforms such as Facebook and Twitter. The adoption of cloud computing has brought about benefits such as operational cost reductions, enhanced reliability of services, improved security increased ease of information sharing, creation and development of diverse sources of information, faster deployment of applications and ICT infrastructure as well as easy monitoring and management of service delivery, among others. The challenges identified as hampering wider adoption of this technology include lack of trust, resistance to change and inadequate awareness of cloud computing capabilities amongst university staff and students. The findings may be useful to The Technical University of Kenya and other public and private universities in Kenya as well as researchers working in this field by providing information on cloud computing and its potential opportunities and challenges for academic institutions. Although other research studies on this theme exist, the current study is original in Kenyan universities setup. Similarly, it is the first to apply the theme to The Technical University of Kenya.

Keywords: *Cloud computing, ICT, cloud computing adoption, SaaS, PaaS, IaaS, universities, Kenya*

Introduction

Cloud computing is defined differently by different scholars. However, its indisputable essential characteristics include on-demand consumer access, broad access to network, pooling of resources, rapid elasticity and scalability, measured service provision/pay-per-use model, virtualised resources/computer resources, customised service level agreements (SLA) and cloud

clients. Cloud computing has four deployment models and three major service models (Mell & Grance, 2011). The deployment models available include private cloud, community cloud, public cloud and hybrid cloud. Private cloud is cloud infrastructure dedicated to one institution (Adekunle *et al.*, 2012). Community cloud model is one in which several organisations with common goals share the same cloud infrastructure. Public cloud model is open to the general public and owned by an organisation selling cloud services (Adekunle *et al.*, 2012). Hybrid cloud infrastructure is a combination of private, community and public clouds. Universities can employ some or all cloud service models to deliver services to customers. For example, they can use public cloud service for general computing, but store critical business data within their own data centres (Adekunle *et al.* 2012). The service models available include Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).

Institutions of higher learning in Kenya are experiencing rapid expansion of programmes as well as student numbers. This trend has forced them to scale up the provision of academic and non-academic services despite the consistent decrease in capitation by the government (Wainaina, 2011; Sultan, 2010). Decreased capitation has lowered the capacity of these institutions to cope with advancements in areas such as information and communication technology (ICT). Essentially, they are unable to acquire, implement and maintain robust and reliable ICT infrastructure. This has led to the quest for less costly yet reliable alternatives. Cloud computing is one of the options universities can use to bridge their technological gaps affordably (Mell & Grance, 2011; Muli & Kimutai, 2015).

Adoption of cloud computing provides institutions of higher learning with benefits such as elastic and dynamic resource provisioning, simpler and computerised management of IT infrastructure, and sharing of nearly unlimited information processing and storage space (Mell & Grance, 2011). United Nations Conference on Trade and Development (UNCTAD) further identified advantages of this technology as: reduced costs for rented IT hardware and software; reduced cost of in-house IT management; greater elasticity of storage; greater flexibility and mobility of access to data and services; immediate and cost-free upgrading of software; and security of data and services. However, some of the factors that negatively impact the diffusion, adoption and implementation of the technology include inadequate infrastructure, lack of skills high cost, unfavourable government procedures and laws, user resistance and security concerns (Kshetri, 2010a; Svantesson & Clarke, 2010). Drivers for cloud computing adoption include

the need to accomplish tasks within a short period of time; unlimited access to infrastructure and resources on the Internet (storage, computing power); removal of hardware and software barriers that affect daily duties and studies; and encouragement of eLearning (Giyane & Buckley, 2015).

Rationale of Study

Cloud computing is one of the emerging technologies that can be utilised in teaching, learning as well as service delivery in both public and private sectors in Kenya. However, the adoption of this innovation by public universities in Kenya is slow (Kshetri, 2011). The reason for this low uptake is unclear. The author therefore conducted this study to:

1. Investigate the extent of adoption of cloud computing at The Technical University of Kenya;
2. Examine the benefits associated with the adoption of cloud computing at The Technical University of Kenya; and
3. Investigate challenges associated with the adoption of cloud computing at The Technical University of Kenya.

Methodology

The author employed descriptive research. Primary data was collected through interview and observation of service delivery to students as well as communication between students and staff on the cloud platform. The Technical University of Kenya was used as a case study in this research. This is because it is one of the latest public universities in Kenya to be chartered and is mandated to offer technical training. The research was conducted between 18 and 22 July 2016. Three ICT officers working at the universities' ICT directorate were interviewed as key informants to the research. The author also observed how the students in the School of Information and Communication Studies used the emails, cloud storage platforms as well as university library repository. These students were observed while in the university computer laboratories and Internet hotspots. Application of cloud-based platforms in teaching and learning, library services and administrative functions were also observed.

Findings and Discussions

The findings of the study are presented and discussed in this section.

The Extent of Adoption of Cloud Computing

The Technical University of Kenya utilises cloud computing for data access and storage. This is facilitated by services such as Google dropbox, iCloud, GoogleDrive, GoogleDocs and student e-mails. Users access these cloud based services via mobile phones, Personal Digital Assistant (PDAs), regular personal computers and notebooks. The university through a partnership with Google, IBM and Oracle provides email services to all students free of charge. The email services provided by Google to the university students uses @students.tukenya.ac.ke domain name.

The Technical University of Kenya library and various departments use applications such as emails and social media (WhatsApp, Twitter and Facebook) to facilitate communication and networking both internally and externally. This implementation of cloud computing facilitates relatively cheaper communication to university staff, students and the public.

The Technical University of Kenya has its own Facebook account named “The Technical University of Kenya”, which it uses to communicate as an institution. The page has 19,052 likes/followers. For example, on 19 July 2016, the university used this platform announce the demise of a senior member of staff. On 18 July 2016, The Technical University of Kenya through its Facebook page also announced the collaboration talk between TU-K & University of Pretoria, South Africa on: Science & Technology, Asset Management and Students' Exchange. The university also has a Twitter handle which is “@TU_Kenya”. This handle has 2,748 followers and 25 likes. The university uses this platform to communicate with the public. For example, on 19 July 2016, the university also announced through its Twitter handle that: “All students wishing to be accommodated in the hostels during the September-December 2016 semester are requested to apply online from July 19, 2016 to August 7, 2016”.

The Technical University of Kenya library's Facebook account is “Technical University of Kenya library”. This page has 2565 likes/followers. The library uses this platform as part of its current awareness services. For example, on 5 June 2015 there was a post on the university library Facebook account that read “More new content available in the library repository (journal articles) and can be accessed through <http://repository.tukenya.ac.ke:8080/>”. Another post on 08May 2015 said; “Please note that you can now access resources

on: Kenya Past and Present (up to 2009); the resource is now online on Open Access. It is available at the following link and requires no password or user name. Go to <http://reference.sabinet.co.za>". At the time the research was conducted, the author noted that the library's Facebook page had not been updated.

The Technical University of Kenya uses DSpace application as an Institutional Repository (IR), a cloud computing application, to provide storage space. This is a digital, open source repository software package running on cloud computing platform. It collects, preserves, and distributes digital material. It serves as the home for the intellectual output from The Technical University of Kenya academic community. It contains digital dissertations, faculty publications, digital special collections, open access publications and open educational resources. Additionally, the students at The Technical University of Kenya also access and use Google cloud storage through their Gmail accounts. This service provides them with free storage space of up to 15 GB accessible across Google Drive, Gmail, and Google Photos. It allows students to create, share and collaboratively work on the same document at the same time in different places.

The Technical University of Kenya also runs a private cloud in its virtualised G7 and G8 HP servers. Virtualisation is a foundational element of cloud computing that helps to deliver the value of cloud computing. It facilitates the running of multiple operating systems and multiple applications on the same server at the same time. The university in its private cloud runs five virtualised servers. The first virtualised server runs DSpace and exchange mail server; the second one manages N-Computing technologies in various labs within the university. The third virtualised server is used for exchange backup, managing student intake and media such as university videos, managing Moodle and monitoring networks. The fourth virtualised server is a domain controller which manages the DHCP server; used as backup of mail server, print server as well as Internet access proxy server. The fifth server is hypervisor virtualised server which runs the proxies and firewalls.

The author noted that although the university has exploited a few of SaaS and IaaS applications, there is still more opportunities for the university to exploit. For example, the university's Enterprise Resource Planning (ERP) application and other information systems can utilise cloud capabilities.

The Benefits Associated with the Adoption of Cloud Computing at The Technical University of Kenya

Cost Reduction

The author established that through the adoption of cloud computing, TUK reduced its capital expenditure. The university through its partnership with Google has saved resources by not purchasing an email server to host students' emails. This saved the university between KES. 800,000-1,000,000. Implementation of private cloud has enabled the university to run 15 different applications on five virtualised servers rather than running each application on an independent server. This has minimised utilisation of resources such as structured cabling, softwares and network switches that could have been bought for every physical server. Consequently, CAPEX was significantly reduced. The author further established that the operating expenditures were also significantly reduced. Running five different virtualised servers means that the university did not need to purchase 15 different licenses, firewalls, antivirus softwares and pay for electricity to power and cool all these servers.

Reliability of Services

This author established that the doption of cloud computing at TUK has promoted reliability and availability of services. Through the use of Google and other service providers for email services the university is able to ensure services are always available to clients. The university ICT staff interviewed confirmed that student emails that are hosted by Google have 99% up-time thus promoting service availability. As a result, students were able to access and share information whenever they required.

Adequate Security Mechanisms

Security measures such as hardware and software protection, human resources management and cost management are cheaper when implemented on a large scale. This is because large firms such as Google cloud services have devoted huge resources to research, development and solving security issues that many institutions cannot afford to on their own. The outhor established that through the adoption of cloud computing, TUK has enhanced security of data and information. The use of Google services such as students' emails have been proved to be less prone to hackers as compared to internal servers that are often being hacked. Google as a cloud service provider also has the ability to monitor and dynamically allocate security resources for filtering, traffic shaping, or encryption as a way of enhancing security against attacks.

The university can effectively exploit the cloud to deliver other services such as eLearning systems, examinations systems, financial information systems, universities' strategic informational materials and ERP with minimal security concerns.

Ease of Information Sharing

The author established that the adoption of cloud computing at The Technical University of Kenya has enabled exchange of information amongst students and between students and lecturers as well as university management. Different departments at The Technical University of Kenya utilise Dropbox, iCloud, GoogleDrive, GoogleDocs, Twitter, Facebook and even WhatsApp platforms for information storage and sharing for simple and cost effective communication. This is much more efficient and effective as opposed to traditional communication systems that include memos on the notice boards and office mails.

Access to Diverse Sources of Information

The author established that the adoption of cloud computing at TUK through DSpace institutional repository enables access to diverse information materials. These cloud-based resources enable easy and open access to scholarly and published academic digital content including text, images, videos and data sets. This facilitates the university community to come up with innovative projects without any fear of resource unavailability since such content can be accessed by anyone from anywhere.

Faster Deployment of New Applications and ICT Infrastructure

The adoption of cloud computing allows The Technical University of Kenya to speed up deployment of applications and solutions while maintaining flexibility. For example, the university downloaded DSpace software which is always available in the cloud for free, is customisable, and can accept any digital content and type. The university does not need to spend on procuring servers and designing software. It can therefore be concluded that it is a lot easier and faster to sign up for provision of cloud computing services and applications rather than purchasing and implementing ICT infrastructure and solutions.

Easy Monitoring and Management of Service Delivery

The research established that through the adoption of private cloud virtualised environment, universities' ICT directorate has been able to easily monitor the networks, proxies and all the servers at a central location. The systems administrators also reported that on private cloud all virtualised servers can

be backed-up simultaneously thereby saving on time. These implementations of cloud computing have given the ICT directorate more control and the flexibility of administering and managing their own systems while providing the benefits of cloud computing.

Access to the Latest Technology

The research established that despite inadequate financial resources, the ICT directorate at TUK can exploit latest cloud capabilities in service provision without necessarily purchasing these resources. These latest software and hardware resources are made available on cloud based platforms such as cloud based social network platform, eLearning platforms, library systems and private cloud through virtualised environment. Adopting this technology provides the university with an opportunity to utilise up-to date technological skill-sets and ICT infrastructure.

Challenges Associated with the Adoption of Cloud Computing at TUK

TUK is likely to experience the following challenges while adopting cloud computing.

Lack of Trust in Data Security and Privacy of Cloud Applications

The research revealed that lack of trust on data privacy hinders the adoption of cloud computing at The Technical University of Kenya. The perception that cloud based solutions and services cannot effectively and efficiently provide security and privacy to institutions' sensitive information has decelerated the adoption of this technology. TUK trusts in-house IT environment as opposed to having its data stored in the cloud. An example is the existence of a guideline forbidding the use of emails to deliver exams. As a result, the university fears to entirely move to the cloud because of the sensitivity of data and information such as financial information, medical information, examination, university strategic information as well as copyrighted scholarly work.

Poor ICT Infrastructure and Inadequate Internet connection

Most of the premises at the university do not have an adequate number of computers for both staff and students. Access to other devices such as laptops, mobile phones, PDAs, regular PCs and notebooks is also limited to a few individuals. It was also established that not all of the existing computers had access to the Internet, yet the Internet is required for one to exploit cloud-based services and resources. Consequently, the university has been slow in exploiting cloud-based services because of poor ICT infrastructure as well as inadequate Internet access.

Inadequate ICT Skills

It was established that some of the students and staff do not possess the requisite ICT skills and technical know-how to exploit cloud computing capabilities such as Google services, Yahoo products, YouTube and even cloud based social media platforms. This has led to decreases in the use of cloud computing.

Lack of Awareness of Cloud Computing Capabilities Amongst University Management, Staff and Students

TUK management, staff and students are unaware of full cloud computing services capabilities. This has led to the underutilisation of available cloud computing models and services. TUK has the opportunity to utilise private cloud for institutional mission-critical applications and data where security is a concern, and use public cloud for low risk institutional information and applications thereby reducing risks.

Lack of Policy on Consumption of Cloud Services

TUK lacks a cloud computing adoption policy to guide the institution on the use and application of cloud services in executing institutional mandate. The policy would foster the adoption of cloud computing by guiding staff training, cloud computing consumption, information security and ICT use as well as ensuring systematic integration and adoption of this technology.

Resistance to Change

The research found that adoption of cloud computing at The Technical University of Kenya is still facing a cultural resistance. Adoption of the services for data sharing and service delivery has been hindered by the perception that technology can only be effectively and efficiently used by tech savvy people.

Conclusion and Recommendations

This chapter investigated the benefits and challenges of cloud computing adoption at The Technical University of Kenya. The findings showed that few services at the institution are exploiting cloud-based capabilities. Other services like learning management systems, student management information system, financial information system and human resource systems are yet to exploit this technology. It was noted that the limitations confronting TUK in its adoption of cloud computing services are not the lack of ideas but rather inadequate funding, limited ICT resources, lack of policy on consumption of cloud services, lack of awareness of cloud computing capabilities, inadequate ICT skills, poor ICT infrastructure and inadequate internet connections.

Adopting a cloud computing environment relieves the institution of the need to purchase costly servers and other related ICT infrastructures. Instead, it leverages on free storage capabilities to reduce OPEX and CAPEX.

With the rapid expansion of ICT and particularly cloud computing in the delivery of services, TUK should no longer be disadvantaged as it should be able to harness the power of a wide variety of cloud capabilities for effective service delivery. This chapter makes the following recommendations:

- **Improve ICT Infrastructure:** TUK should invest in adequate and sustainable ICT infrastructure and provide stable Internet connectivity to facilitate access to cloud based services.
- **Enactment of favourable policies:** TUK needs to develop and implement policies on staff training, cloud computing adoption, as well as ICT policy to support the adoption of this technology. These policies will create a favourable environment that will facilitate the delivery of services to the students in a globalised environment.
- **TUK should embrace change:** The best possible way to reorganise a business change is to emphasise change and promote ICT literacy and enlightenment through capacity building.
- **Increase funding for infrastructural projects:** TUK needs to increase funding to ICT directorate. Such funding will facilitate upgrading as well as extension of existing TUK Local Area Network (LAN) and the Internet access.
- **Create awareness of existence and benefits of cloud computing amongst the staff and students:** TUK has to introduce cloud computing programmes that will enable its staff and students to know and utilise cloud-based services.
- **Management support:** The involvement of the top management while the university is attempting to move service provision to the cloud is an important determinant of success of the adoption of cloud computing. Their support will help in translating policies into goals, objectives and strategies as well as overseeing the implementation of the same.

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