The Potential of Library 2.0 for Research Libraries in Kenya

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DEDICATION

This thesis is dedicated to Lilian, Tanya and Sasha.

ABSTRACT

The environment in which libraries currently operate has changed drastically. For instance, the emergence of new information and communication technologies, exemplified by the Internet, has changed the way people seek information, communicate and collaborate. Thus, modern library users have embraced new information seeking behaviour as well as expectations for better usability, faster response times to needs, and constant access to unrestricted library services. As libraries struggle to cope with these changes and user expectations, some library users are already reducing their levels of usage, preferring to "Google" than visit a physical library. Similarly, library circulation statistics indicate that the usage of the traditional services and products is decreasing steadily while the usage of electronic resources and services is increasing. Critically, most users do not presently perceive the library as the first or only stop for information. Libraries are therefore struggling to attract new users and retain the existing ones.

Research libraries in Kenya, due to their vision and mission as well as the heightened expectations of the users, are under immense pressure to change. Indeed, a number of them are already changing by introducing new services facilitated by the emerging Information and Communication Technology (ICT) tools. However, the services and products are still limited in scope and depth because they have been patterned after the conventional services. One of the greatest predicaments the research libraries currently face is how to model and manage this change. This study investigated the potential of the Library 2.0 model of library service in facilitating the research libraries in Kenya to respond more closely to the emerging user needs and expectations.

The study employed interpretive qualitative research methodology and multiple case studies to investigate the current status of research libraries in Kenya and their challenges in meeting the dynamic needs of the researchers. Furthermore, the study investigated the extent of application and use of the Library 2.0 model. Data was collected from five case study sites – African Medical and Research Foundation (AMREF), International Centre for Research in Agroforestry (ICRAF), International Livestock Research Institute (ILRI), Kenya Agricultural Research Institution (KARI) and Kenya Medical Research Institute (KEMRI) – through interviews of researchers and librarians; focus group discussions with researchers and librarians; Social Network Analysis; direct observations; and mystery shopping. The data was analyzed using content analysis, conversation

analysis, descriptive/interpretive techniques (Heideggarian hermeneutics) and Computer Assisted Qualitative Data Analysis Software (CAQDAS) such as Nvivo and UCINET.

The findings of this study show that most research libraries in Kenya do not have documented vision, mission or strategic plans; are underfunded and understaffed; hold inadequate collections in equally inadequate physical spaces; largely apply the traditional library service model; face negative internal politics and unfavourable organizational structures; and lack mutually beneficial linkages. The findings also indicate that the research libraries in Kenya are underutilized and barely meet the needs of the researchers in their current status. The findings of this study also suggest that the Library 2.0 model holds great potential to enable the libraries to take their services and products everywhere the researchers are; remove the barriers to accessing library services; facilitate and direct constant purposeful change in their services and how they are delivered; harness the active participation of the users; retain the new breed of users (Patrons 2.0); and remain user-centred.

Based on the findings, the researcher recommends that the librarians who head research libraries should hold PhD degrees to enable them to participate effectively in institutional decision-making; the research libraries should establish close ties with academic libraries supporting programmes related to their research interests; the research libraries should form a specialized consortium and association to serve their unique interests; the research libraries should consider grey literature as an important source of research information and develop strategies of managing it; and schools of librarianship should introduce courses on ICTs, models of library service, marketing and facilitation (training) to equip the students with the skills needed to meet the emerging demands on librarians.

The researcher also proposes a Research Library 2.0 meme map which is an adaption of the Library 2.0 meme map. The former map is different from latter in that it is specific to research libraries and recognizes the fact that an effective Research Library 2.0 requires the active interaction of enhanced collection (Collection 2.0), library physical space (Physical Space 2.0), researchers (Researcher 2.0) and librarians (Librarian 2.0) to thrive. The researcher also recommends that further research be conducted to investigate the potential of the Library 2.0 model for all the other library typologies in Kenya and Africa; explore the influence of gender on librarianship in Africa; investigate the application of Social Network Analysis in library and information research; and develop an inventory of all types of libraries in Kenya.

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ABBREVIATIONS

A&HCI	:	Arts & Humanities Citation Index
ACADIA	:	Association for Computer Aided Design in Architecture
ACTS	:	African Centre for Technology Studies
ADDRF	:	African Doctoral Dissertation Fellowship
AERC	:	African Economic Research Consortium
AGORA	:	Access to Global Online Research in Agriculture
AHILA	:	Association for Health Information and Libraries in Africa
AI	:	Artificial Intelligence
ALA	:	American Library Association
ARL	:	Association of Research Libraries
AMREF	:	African Medical & Research Foundation
APHRC	:	African Population & Health Research Centre
ART	:	Antiretroviral Therapy
ASARECA	:	Association of Strengthening Agricultural Research in Eastern and Central Africa
ATM	:	Automatic Teller Machine
AWARD	:	African Women in Agricultural Research and Development
BIEA	:	British Institute in Eastern Africa
CAQDAS	:	Computer Assisted Qualitative Data Analysis Software
CARTA	:	Consortium for Advanced Research Training in Africa
CCK	:	Communications Commission of Kenya
CD	:	Compact Disc
CDC	:	Centers for Disease Control and Prevention
CDS-ISIS	:	Computerised Documentation Service-Integrated Set of Information Systems
CGIAR	:	Consultative Group on International Agricultural Research
CGLISC	:	CGIAR Libraries and Information Services Consortium
CHE	:	Commission of Higher Education
CIBER	:	Centre for Information Behaviour and Evaluation Research
CLIR	:	Council on Library and Information Resources
CPCI-S	:	Conference Proceedings Citation Index – Science
CPCI-SSH	:	Conference Proceedings Citation Index – Social Science and Humanities
CTA	:	Technical Centre for Agricultural and Rural Cooperation
CV	:	Curriculum Vitae
DFID	:	Department for International Development
DSTV	:	Digital Satellite Television
DVD	:	Digital Versatile Disc
FAO	:	Food and Agriculture Organization
FGD	:	Focus Group Discussion

FOI	:	Freedom of Information
GOK	:	Government of Kenya
IAALD	:	International Association of Agricultural Information Specialists
ICIPE	:	International Centre for Insect Physiology and Ecology
ICRAF	:	International Centre for Research in Agroforestry
ICSU	:	International Council for Science
ICT	:	Information and Communication Technology
IDRC	:	International Development Research Centre
IFLA	:	International Federation of Library Associations and Institutions
IL	:	Information Literacy
ILL	:	Interlibrary loan
ILRI	:	International Livestock Research Institute
IM	:	Instant Messenger
IMTR	:	Institute for Meteorological Training and Research
INASP	:	International Network for the Availability of Scientific Publications
IPAR	:	Institute of Policy Analysis and Research
ISI	:	Institute for Scientific Information
JKUAT	:	Jomo Kenyatta University of Agriculture and Technology
KAINET	:	Kenya Agricultural Information Network
KARI	:	Kenya Agricultural Research Institute
KCCT	:	Kenya College of Communications Technology
KEFRI	:	Kenya Forestry Research Institute
KEMRI	:	Kenya Medical Research Institute
KENET	:	Kenya Education Network Trust
KIMC	:	Kenya Institute of Mass Communication
KIPPRA	:	Kenya Institute for Public Policy Research and Analysis
KIRDI	:	Kenya Industrial Research Development Institute
KLA	:	Kenya Library Association
KLISC	:	Kenya Library and Information Services Consortium
KNLS	:	Kenya National Library Services
KMFRI	:	Kenya Marine and Fisheries Research Institute
KRA	:	Kenya Revenue Authority
KSMS	:	Kenya School of Monetary Studies
KTCIP	:	Kenya Transparency and Communication Infrastructure Project
KWS	:	Kenya Wildlife Services
LAN	:	Local Area Network
LCD	:	Liquid Crystal Display
MPH	:	Master of Public Health
NESC	:	National Economic and Social Council
NUD*IST	:	Non-numerical Unstructured Data with Indexing, Searching and Theorizing
OCLC	:	Online Computer Library Centre

OPAC	:	Online Public Access Catalogue
PACP	:	Public Access Computing Project
PC	:	Personal Computer
PERI	:	Programme for Enhancement of Research Information
RAILS	:	Regional Agricultural Information and Learning System
RAIN	:	Regional Agricultural Information Network
SCI	:	Science Citation Index
SSCI	:	Social Science Citation Index
SNT	:	Social Network Theory
TEEAL	:	The Essential Electronic Agricultural Library
TV	:	Television
UN	:	United Nations
UON	:	University of Nairobi
UP	:	University of Pretoria
VCD	:	Video Compact Disc
WAN	:	Wide Area Network
WEBLIS	:	Web based Library Integrated System
WHO	:	World Health Organization
WSU	:	Washington State University
XML	:	Extensible Markup Language

CHAPTER ONE - INTRODUCTION

1.0 Introduction

The emergence of the Internet and related technologies facilitated a momentous change (Albanese 2001) in the way people seek information, communicate and collaborate (Limb 2004; Casey and Savastinuk 2006; Miller 2006; Rothman 2006; Courtney 2007). Practically every day seems to bring new ICT applications allowing "us to do more and more" information storage, organization and communication (Smith 1990; Casey and Savastinuk 2007b) and offering new means of serving users (Underwood 1990) who can now be virtually "in touch"[1] every minute of the day from anywhere. As the users become more aware of the possibilities of using technology and find it easier to go to Google than drive to the library, the library faces immense challenges on how effectively to offer services to such users. These challenges and emerging possibilities have triggered new conversations on how to discover, invent and/or share knowledge in this age (Casey and Savastinuk 2007b). These applications and conversations, as Smith (1990) puts it "are altering, before our eyes, what we [librarians] are doing and have been doing for years, decades, even centuries." They have also created new expectations for better usability, faster response to customer needs with better products (Casey and Savastinuk 2007b) and have exposed the limitations of library services available at a physical building with limited opening hours (Shuman 2001; Chad and Miller 2005; Rothman 2006), strict membership requirements, limited information resources and imperfect user involvement in influencing the services they get (Cohen 2006a). The information environment within which libraries now find themselves is changing, probably faster than ever before (Smith 1990; Miller 2006; Casey and Savastinuk 2007b) and becoming even more complex (Underwood 1990). As the pace of this change accelerates, the greatest challenge to the libraries and librarians now is how to keep up (Courtney 2007).

Statistics[2] provided by the Online Computer Library Center (OCLC) and Miller show that many users still prefer and trust traditional libraries (OCLC 2005; Miller 2006), but only for borrowing books; there exists a dissonance between the environment and content that libraries provide and the

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[1] Connected to each other and essential systems constantly through telecommunication tools from wherever they are.
[2] OCLC's 2005 publication, *Perceptions of Libraries and Information Resources*, reports on a survey of 3,348 Internet users from Australia, Canada, India, Singapore, the United Kingdom and the United States, and is available from their website at http://www.oclc.org/reports/2005perceptions.htm.

environment and content that information consumers want and use. Preferences for self-service, satisfaction and seamlessness have been identified as some of the indicators of this dissonance in the infosphere.[3] Therefore, library service characteristics that support self-service or disintermediation[4] (Downey 1998), user satisfaction and seamlessness such as ease of use, convenience and availability are now as important to the modern user[5] as quality and trustworthiness of the products (OCLC 2005).

As libraries struggle to cope with the new demands and challenges, OCLC's (2005) report and other statistics (Aiken 2006) indicate that they are rapidly relinquishing their place as the top sources of inquiry (Chad and Miller 2005; Campbell 2006). Indeed a sizable number of current library users indicate that they will reduce their library use in due course (OCLC 2005). This change can be attributed to the constantly shifting expectations of users, especially revolving around time and convenience of use of library services and collection (D'Elia *et al.* 2002). Fundamentally, modern library users simply expect to be able to access any information they want anytime anywhere (Blyberg 2006; Crawford 2006). They want the library service to fit their lifestyle and not vice versa (OCLC 2005). They easily note when this is not happening and stop coming to the library (Albanese 2004).

A hint as to where fleeing library users go is given by a sizable number of current library users who affirm that they have reduced their library use as a consequence of using the Internet (OCLC 2005). This view is also supported by a number of research studies conducted by the Public Access Computing Project (PACP)[6] which have also confirmed, through circulation statistics, that usage of the traditional library resources has been on a steady decrease since the 1990s[7] whilst an increase in the use of electronic resources has been noted over the same period (D'Elia *et al.* 2002). There is also

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[3] The collected data and information in cyberspace and different forms of media from which resources for research, decision-making and human knowledge can be drawn as well as the environments in which this is done.

[4] Disintermediation is giving the user or the consumer direct access to information that would otherwise require a mediator, such as a salesperson, a librarian, or a lawyer.

[5] New calibre of users who are not only technology savvy but are interested in quality and trustworthiness of the information products and not just access; are keen to get information anywhere anytime; exhibits new information seeking behaviour and characteristics reported by Centre for Information Behaviour and Evaluation Research; and not satisfied by traditional library services offered in a building.

[6] This is a research organization conducting studies on a number of librarianship issues and supported by the Gates Foundation and other philanthropic organizations. A number of these research findings and reports are available on various websites.

[7] This period coincides with the emergence and acceptance of the Internet as an important information resource.

a perceived increase in the usage of libraries which offer Internet access and other online services (D'Elia *et al.* 2002). This observation is also supported by the PACP studies which have provided anecdotal evidence that including Internet access points and other electronic services in libraries increases library usage (Kinney 2010).

The Centre for Information Behaviour and Evaluation Research (2007) also argues that modern library users seem to have embraced a new information seeking behaviour that is not compatible with the old library service model nurtured in a hardcopy system and, in many respects, still tied to it. Instead, this information seeking behaviour can be characterized as being horizontal, bouncing, checking and viewing in nature. Therefore, current library users are perceived as being "promiscuous", diverse and volatile. This information seeking behaviour is described as a form of skimming activity, where people view just one or two pages from an online resource or site and then "bounce" out, perhaps never to return. The Centre for Information Behaviour and Evaluation Research (2007) further suggests that these users: 1) are generally more competent with technology, pick up these skills on the move through trial and error and expect a lot from ICTs; 2) prefer interactive systems and are turning away from being passive consumers of information; 3) have drastically shifted to digital forms of communication such as texting rather than talking; 4) multitask in most, if not all, areas of their lives; 5) prefer info-tainment approaches to traditional information provision; 6) have limited tolerance of delay in the provision of services; 7) find their peers more credible as sources of information than authority figures and structures; 8) feel the need to remain constantly connected; 9) believe everything is on the web; and 10) are format agnostic.

In spite of this apparent high preference for the "Internetized" information services, some library scholars and practitioners are of the view that the value of the Internet in information services provision has been hyped and founded on myths rather than facts. Herring (2008) lists a number of reasons why the Internet cannot be a substitute for libraries. These reasons challenge the very key features of the Internet that have been proposed as its strong point against the libraries. He argues that the Internet does not have everything; lacks organization; lacks quality control; and that Internet access is really not ubiquitous, even in developed countries. The Southern Region Education Board[8] (2008) also supports Herring's arguments and adds that besides the Internet not containing all

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[8] The Southern Regional Education Board is a partner in the Southeast and Islands Regional Technology in Education Consortium, one of the six United States Department of Education regional technology consortia.

existing information its usage is also not free and concludes that digital libraries cannot be a substitute for ordinary libraries. Price (2003) also points out that there are instances when the Internet only provides links to information and emphasizes that "a link to a possible answer is still not an answer." Borsato (2004) adds that even though the Internet may "marginalize" the library in certain respects, it cannot entirely be a substitute for it. This view is also supported by D'Elia *et al.* (2002) who propose that the Internet and the library should evolve a complementary relationship with each fulfilling certain information needs and functions. This relationship, they add, will enable the two to reinforce each other's use.

Furthermore, the OCLC (2005) research highlights very unflattering perceptions of the modern library user about the library and its resources in the light of the digital revolution. These include: 1) Large number of users beginning their information searches with search engines rather than librarians or catalogues. 2) People who have used both search engines and librarians for information searches admit that both approaches yield results of more or less similar quality. 3) Libraries are about the provision of outdated, dirty, bulky and often unavailable books not information. 4) The library is not the first or only stop for many information seekers; though this is not an entirely new finding, the situation is worse now because more alternatives to the library exist. 5) Information seekers are not satisfied with the library experience and desire that it should stretch beyond books, crowded noisy reading areas, the need to travel and limited parking, bureaucratic limitations on use of resources, as well as unfriendly, unavailable and ill-informed staff. Librarians have, therefore, to strive to get new users as well as draw apathetic ones back into the libraries.

How libraries respond to and manage these changes and perceptions is critical for their survival. Most library scholars and practitioners agree that professionally, the nature of work in library and information services has changed and is continuing to change (Underwood 1990; Crawford 2006). Casey and Savastinuk (2007b) agree that change is already happening in libraries but there are divergent views regarding the nature of this change. On the one hand are those who assert that libraries need to take revolutionary measures to adjust their services – how they are designed and delivered. On the other hand are those who aver that these changes are not unique and should be dealt with in the same way libraries have handled myriad environmental and technological changes over the centuries. Yet there are others who are of the view that the changes in libraries have not been managed well and have generally failed to meet the customers' needs (Casey and Savastinuk

2007b). There is consensus, however, that an approach that could prove effective in containing these changes is to make libraries relevant to what the users want (non-essential services and facilities that enable the users to control library tools such as OPACs,[9] access to library services and resources on portable digital devices, among others) and need (essential services and tools that facilitate identification, location and use of current resources) in their daily lives (Albanese 2004; Abram 2006; Blyberg 2006; Casey and Savastinuk 2006; Cohen 2006a; Miller 2006; Walter 2006) so as to make the library a preferred destination and not just an afterthought. To do this, libraries need to offer traditional services more efficiently and new services which appeal to those comfortable with new ways of accessing information (Casey and Savastinuk 2007b).

Those who support revolutionary measures reason that although libraries and librarians have continued to evolve over the years in response to the ever changing community needs, the current scenario requires newer strategies, models and tools of service (Courtney 2007). They also argue that to handle these technological threats and opportunities, librarianship as a profession will drastically change and may even require renaming. The title "Cybrarian" has been proposed by some to describe the new generation librarian operating in cyberspace using high precision data mining techniques and combining both online and offline collections to satisfy the needs of their patrons (Shuman 2001). Sidorko (2004) suggests two more titles; Internet navigator or hybrarian (hybrid librarian). Others also aver that ICT is multiplying the channels through which information can flow from the creators to the users and that some channels can circumvent libraries and information services as traditionally conceived (Underwood 1990). Some also point out that the ratio of digital to print resources is continually rising to take advantage of the economies of scale and superior capabilities of the new information technologies leading to a steady rise in the proportion of digital resources in the modern library collections (Limb 2004). They further argue that just like the invention of printing, the digital revolution will catalyze the conception and birth of a new library (Casson 2001; Limb 2004). Limb (2004) and Hoskins (2009) further argue that the digital nature of information resources is now introducing a paradigm change in collection development from a focus on acquisition of the actual resources to obtaining remote access rights to them. They suggest that this is revolutionary. Proponents of this school of thought generally conclude that the current changes, together with those that are yet to emerge, will definitely mark a critical milestone in the

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[9] OPAC stands for Online Public Access Catalogue which is essentially digital catalogues of library resources which can be accessed remotely electronically.

history of the ever evolving libraries and librarians seeking out the newest technologies enabling them to offer timely and user-centric services to their communities (Plutchak 2006; Courtney 2007) and thus start a revolution. In their view, this transformation is so deep that it is no exaggeration to speak of a new paradigm in library operations and services (Limb 2004).

Those who view the current scenario as requiring just ordinary change argue that although the use of technology may enhance the speed of library and information service delivery, these uses do not constitute novel approaches (Underwood 1990). To illustrate this point, Underwood (1990) explains that the use of electronic mail (email), for instance, does not revolutionize message transmission as the message still arrives at the mailbox, albeit electronically. The essential nature of the service – passing information from source to destination – is not changed. Shuman (2001) also asserts that it would be short-sighted to think of the Internet as some radical, newfangled innovation. He explains that computerized storage and retrieval of library files – the salient aspects of the Internet – has been in use for many years now. In his view, the integration of email and hot links to the Internet technology is merely a refinement of what libraries have been making available to their patrons for generations. In this school of thought, therefore, the emergence and adoption of new ICTs in libraries complements rather than replaces the existing approaches (Underwood 1990; Shuman 2001). Limb (2004) also adds that no radical changes will be experienced in the library scene as the new libraries will be syncretic combinations of traditional and digital collections and operations. Those who support this view also point out that apart from technology, libraries have also made strategic changes over the centuries to adapt their services and collections to the dynamic needs of their patrons. They mention opening access to library collections as one of these changes. In comparison to the Medieval and Monastic libraries where some books were literally chained to the shelves thus restricting their access and usage, modern libraries are quite liberal (Noruzi 2004). But they conclude that though the form and delivery of information through libraries has changed, the basic functions of a library remain to identify, acquire, process, arrange and make available information. Consequently, libraries continue to perform essential operations such as material selection, acquisition, cataloguing, circulation, maintenance, preservation, reference, and document delivery. The level of transformation in these functions is mere evolution and not revolution (Limb 2004).

There is yet another school of thought which posits that past, current and future changes in library services are neither evolutionary nor revolutionary. These changes ride on user-centricity which is a basic tenet of library services (Solomon 2006). Again, the proponents of this view aver that the core functions of the library still remain much the same. For these reasons, they conclude that the current changes are neither evolutionary nor revolutionary (Crawford 2006).

Whatever nature change takes, it appears that the Internet and related technologies will remain a major pillar of modern library services. Due to its architecture and functions, the Internet can facilitate better library service design and provision in a number of ways: 1) With the increasing ubiquity of the Internet, it can enable libraries to make their services virtually available in more places (everywhere?) and extend them beyond physical walls and limited opening hours (Ferguson 2000; Shuman 2001; Miller 2006). 2) The Internet and other emerging technologies can make seamless interactivity between the libraries, librarians and the users possible giving the latter an opportunity for participation in determining what and how they are served (Albanese 2004; Blyberg 2006; Miller 2006). 3) The technologies can facilitate simple, efficient, fast and versatile services in which nothing is borrowed or checked out and nothing needs to be returned (Arms 2000; Shuman 2001). 4) Internet facilitated services can enable libraries to offer timely and diverse information resources far beyond the realms of ordinary collections within the library setup restricted only by the amount of time the users have and their creativity. Further, the use of ICT removes or reduces concerns of damage, mis-shelving or loss of copies and besides, multiple users have the potential to access the same resource simultaneously (Shuman 2001). Access to resources by multiple users, however, is subject to licensing policies.

Libraries have been trendsetters in the digital field. They were quick to understand the new paradigm of the automated age and especially the value of databases and electronic indexing (Limb 2004). In the face of these many changes, the big question is what role – if any – the libraries and librarians in an ICT facilitated information service platform will play and how they will play it. The answer to this question will help resolve the puzzle relating to whether the profession and practice needs a revolution or evolution or neither as argued earlier. However, Shuman (2001) is quick to point out that the human librarians will still be needed to 1) organize the millions of resources in cyberspace; 2) teach the users how to utilize the new technology to search and retrieve information effectively; and 3) to develop new approaches to information services. But Limb (2004) explains that how the

libraries respond to these changes and user demands will largely influence their popularity and survival. He suggests that the site or shape of the library may have to change significantly to accommodate these new needs.

Fourie (2004) argues that in a dynamic information and technology-driven society, librarians should create new roles and position themselves in time to play them (the roles) effectively. In her discussion of the concept of disintermediation in libraries, she explains that in the light of the widely available access to information resources facilitated by ICTs, the role of librarians may be limited to empowering library users to self-serve. She suggests that the new role may include 1) negotiating best (quality) information sources (including databases) with publishers on behalf of the users; 2) organizing subject access to unstructured information sources; 3) designing ICT information systems such as Intranets to enable easy access to information and information sources; 4) providing requisite training and support services for the users; 5) conducting practical research on information retrieval; 6) monitoring the quality of databases and other information sources; and 6) working with other stakeholders to improve the quality of and access to information. She concludes that the training of librarians (information specialists) should change to empower them to act as intermediaries effectively. She underscores the need to blend theoretical and practical elements in the librarianship training curricula. She also suggests that given that librarians may bear more responsibility in educating the users, it would be prudent to include teaching skills in the curricula as well (Fourie 1999). On his part, Sidorko (2004) adds that the new role would require librarians to possess organizational, marketing and information presentation skills beyond the technological, communication and bibliographic skills.

In view of the foregoing, the big question is what benefits the new Library 2.0 model – which some scholars and practitioners hold as the embodiment of the desired changes in designing and delivering library services – offers and how suitable it is in anticipating, harnessing and responding to the dynamic user needs (Smith 1990; Lougee 2002; Limb 2004; Casey and Savastinuk 2007b). Farkas (2008) identifies five points that summarize the essence of Library 2.0. These are: 1) Getting to understand user needs and wants through a culture of self assessment and changing services, systems and tools to meet those needs; 2) Believing and trusting users, listening to them and giving them a role in helping to define library services that meet their needs; 3) Being able to learn and experiment, learning from failures and continuously working to improve services based on user

feedback; 4) Being aware of emerging technologies and opportunities, trends and experimenting with them; and 5) Looking outside of the library world for applications, opportunities, inspiration and understanding of the culture of the technologies and how they are used by the public. Thus, it is a culture change that affects the way the libraries are structured and how they conceive and offer services to their users. This change also influences how librarians conceive of their role in relation to their communities of users and the implicit power relations that this relationship embraces.

However, it is prudent to point out that while Library 2.0 represents a model change, it is of a nature close to the tradition and mission of libraries (Crawford 2006) and enables them to effectively respond to the constantly changing user needs (Casey and Savastinuk 2007b). It enables access to information across society, the sharing of that information, and its utilization for the progress of the society (Albanese 2004; Miller 2006). Library 2.0, really, is merely a description of the latest instance of a long-standing and time-tested institution in a democratic society. Indeed, libraries – and librarians – have influenced technological and literary developments in society over the years. But still, it should be noted that though Library 2.0 concepts like change and user participation are not new to the profession, using them together in the new (Library 2.0) model helps to keep the libraries relevant in response to rapidly changing user needs necessitated by technological and socio-economic trends (Casey and Savastinuk 2007b). Library 2.0 is the marriage of Web 2.0[10] and librarianship presided over by librarians and users (Albanese 2004; Abram 2006; Cohen 2006a, Crawford 2006; Habib 2006; King 2007a).

1.1 Statement of the problem

Research libraries in Kenya, unlike those in other countries where the public, academic, national and special libraries pioneered automation (Rowley 1993), are some of the early adopters of ICT as a tool of information management and dissemination. This development can be attributed to the need to meet highly specialized user requirements and relatively better funding by the parent organizations. Indeed, most of the research libraries in Kenya have elements of electronic services and tools such as websites, Intranets, online catalogues and access to online information resource databases. This is an indication that the libraries have the requisite resources to facilitate changes necessitated by the

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[10] A term used to refer to the perceived ongoing transition of the World Wide Web from a collection of static websites to a full-fledged computing platform serving web applications to end users and enabling them not only to read or access content but also to change it by editing (modifying), adding or deleting items.

emerging needs of their users. However, these services are still very limited in scope and depth since they seem to have been introduced with the assumption that the previous pattern of services can, and should, continue without radical change apart from a welcome increase in speed, possible reduction of costs or other tangible benefits (Underwood 1990). For instance, they do not yet recognize and are not able to meet the expectation of users to self-serve themselves (OCLC 2005; Underwood 1990). Further, they use systems that are far less intuitive than the ubiquitous search engine (Centre for Information Behaviour and Evaluation Research 2007). Besides these largely technological challenges, the libraries also face funding discrepancies with the majority having their budgets drastically reduced to fit into the available resources. Further, some do not even receive the approved funds at all and are basically struggling for survival (Levey 1993). Consequently, there is more pressure on these libraries to meet dynamic user needs efficiently with dwindling budgets and deliver real value for the supporting institutions and users (Underwood 1990; Arms 2000; Lougee 2002).[11]

There are ongoing intra-institutional, inter-institutional and professional conversations on how best to respond to these emerging challenges. For instance, discussions are going on under the auspices of the Kenya Library Association (KLA) on mailing lists as well in conferences, one of which was held in November 2008 at Egerton University.[12] Coincidentally, integration of ICT tools in designing and delivering library services dominates the discussions. Besides, a number of progressive libraries have begun networking and sharing resources (for example, subscriptions to online journals) through the Kenya Library and Information Services Consortium (KLISC)[13]. Champions for change are also emerging especially in those libraries that are seeking and ready to utilize new models of services to satisfy emerging needs.[14] Some of the libraries have recently evaluated their services and have received the clear signal to initiate change on various fronts. The major predicament these libraries face is how to model and manage this change.

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[11] These views were obtained from preliminary interviews with librarians in a number of research libraries, including AMREF, ICRAF, ILRI, KARI and KEMRI, between 14 and 18 April 2008.

[12] 1st International Conference on Digital Libraries and Information Management in a knowledge society: a South/East Africa perspective 2008 held at Egerton University, Nakuru Kenya between 25 and 29 November 2008 and hosted by the Kenya Library Association (KLA).

[13] The Kenya Library and Information Services Consortium (KLISC) was formed in 2004 as a result of a collective need to share the cost of accessing electronic resources made available to Kenyan researchers through the International Network for the Availability of Scientific Publications (INASP).

[14] Obtained from preliminary discussions with Grace Kamau (Head, ILRI InfoCentre), Jane Ireri (Head, AMREF Library), Nancy Kamau (Head, KEMRI Library), Rachel Rege (Asst Director, Information & Documentation at KARI), Jacinta Kimwaki (Head, ICRAF Library), and Humphrey Keah (Librarian, ICRAF).

To address the growing concern, this study sought to investigate and recommend a suitable model of service that research libraries in Kenya can adopt to transform themselves into modern knowledge centres taking on the new roles and approaches (Ferguson 2000; Lougee 2002; Albanese 2004; Blyberg 2006; Miller 2006) discussed above. Library 2.0 model has been recommended by many scholars (Albanese 2004; Abram 2006; Chad and Miller 2005; Blyberg 2006; Cohen 2006a; Habib 2006; Casey 2007; Casey and Savastinuk 2007b; Stephens 2007; Walter 2006) as the preferred model for modern libraries. What Library 2.0 really is or is not is still under discussion in biblioblogosphere[15]. This research was designed to be part and parcel of these ongoing deliberations even though most of them - so far - revolve around public libraries (Crawford 2006; Habib 2006). It sought to focus this discussion on research libraries with the aim of establishing whether and how this model can be applied to research libraries in Kenya.

1.2 Objectives of the study

As technology adoption levels advance, many researchers are turning to the Internet and other emerging technological tools to search for and retrieve up-to-date information in their areas of study. At the same time, new media may also engender new forms of interaction between different researchers. These media have also enabled better collaboration and publishing of research projects to a global audience (Casey and Savastinuk 2006).

These changes have brought the research library into sharp focus. Compared to ICTs, there is a perception that the use of libraries requires more time, is inconvenient and generally yields outdated information resources. Research libraries face an increasingly consequential choice: they can opt to continue to function as they did in the print era – seeking to gather and preserve copies of research and scholarly records. Conversely, they can take advantage of ICTs to offer better services to their users. Accomplishing this will be a formidable task (Smith 1990).

The overall purpose of this study was to investigate the potential of Library 2.0 model for research libraries in Kenya. This involved seeking to understand: the vision and mission of research libraries

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[15] These are blogs which are written to act like books and used within a blog community (Informancy 2005). The term "biblioblogosphere" was coined to describe the world of library and librarian weblogs (Schneider 2005). According to Hane (2001), weblogs are a natural tool for librarians, but individual interest has not translated to the organizational level as Clyde (2004) notes that "blogs do not seem to be so natural for libraries".

in Kenya in an effort to develop requisite benchmarks of service for the same; service and operation models they currently employ and how effective they are; how these models support or inhibit the provision of open and prompt information services in anticipation of the enactment of the Freedom of Information Bill of 2008[16] to operationalize the Freedom of Information Policy of 2006 and the institutional obligations under the Kenya Communications (Amendment) Act of 2008[17] given that some of the cases are government institutions; the challenges research libraries in Kenya and elsewhere face in a connected generation and how these affect their success in meeting their vision and mission; the potential alternative models that they could consider; the Library 2.0 model; and how best to enable research libraries in Kenya to meet their challenges.

This study broadly investigated the emerging role(s) of research libraries as a result of the changing operational and professional environments stimulated by ICTs and other factors. It also investigated whether and how libraries need to change their models of service to adapt to the new role(s). Critically, the study also examined the potential of Library 2.0, in particular, as an alternative model for designing and delivering appropriate services by research libraries. The specific research objectives and corresponding questions investigated by the study were as follows:

Objective 1: Develop requisite benchmarks for research libraries in Kenya

1. What is the vision of research libraries in Kenya?
2. What is the mission of research libraries in Kenya?
3. How well has this role been played?
4. How are the roles of research libraries in Kenya changing in light of the information revolution?
5. What should the benchmarks of service for research libraries in Kenya be?

Objective 2: Understand the operations of research libraries in Kenya
1. What service models are currently employed by the research libraries in Kenya?
2. How effective are these models in fulfilling the vision and mission of the libraries?

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[16] This bill will provide legal mechanisms for the Freedom of Information Policy of 2006 which aims at assuring free, prompt and mandatory public access to information held by the government and its agencies and proposes a legal framework within which this can be operationalized. It is still pending in Parliament. Though there are indications that it may be passed in due course, it has not been enacted as at the writing of this dissertation.

[17] This Act was passed by Parliament in late 2008 and became law in January 2009. It seeks to provide a legal framework for the National ICT Policy of 2006. The draft policy was released by the Government of Kenya in 2006 and was under discussion by the stakeholders most of 2007. It basically aims at improving the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services.

3. How are the models applied compliant to the provisions and requirements of the Freedom of Information Policy (2006), the Kenya National ICT Policy (2006) as well as the Kenya Communications (Amendment) Act (2008)?

4. Are there any social networks existing in the ecosystem of this library? What is their current impact? How can they benefit the library?

5. What are some of the challenges already identified by the libraries and their communities of users?

6. What other challenges exist?

7. How, and to what extent, do these challenges affect the success of these libraries?

Objective 3: Identify and explore other models of library service that could be adopted by the research libraries in Kenya

1. What other library service models exist?

2. What are their advantages and disadvantages for research libraries in Kenya?

Objective 4: Explore the Library 2.0 model

1. What is Library 2.0?

2. What are the controversies around the model?

3. Which libraries have adopted this model?

4. Which lessons can be learnt from their experience?

5. What is the future of Library 2.0?

Objective 5: Applying the Library 2.0 model for research libraries in Kenya

1. What are the benefits of adopting the model for research libraries in Kenya?

2. What challenges are the libraries likely to face when adopting this model?

3. What is the plan of action that should be taken by research libraries in Kenya seeking to become Research Library 2.0?

A summary of the objectives, research questions and respective data sources is enclosed in Appendix 1.

1.3 Theoretical framework

Maness (2006) identifies four elements that should form a conceptual framework for Library 2.0 which were used in the study. These include:

1. *It is user centered* – Users participate in the creation of the content and services they receive from the libraries. The consumption and creation of content is dynamic allowing the roles of libraries and users to merge. Library 2.0 uses the collaboration tools of the Web 2.0 model to facilitate this.

2. *It provides a multi-media experience* – Both collections and services of Library 2.0 contain video, audio and other media. Virtually, there are no limits to the formats of content receivable through this model. At the same time, there is virtually no restriction on what physical devices or software systems and platforms that users can employ to access Library 2.0 services.

3. *It is socially rich* – The Library's ecosystem recognizes and includes users' presence. There are both asynchronous and synchronous ways for users to communicate with one another and with the librarians. These systems are non-linear and constantly grow and mutate. This diversity must be effectively managed to yield robust, enriched and all-inclusive services to the users.

4. *It is community innovative* – This is a very important aspect of Library 2.0. It does not only rest on the foundation of libraries as a community service, but also understands that as communities change, libraries must not only change with them, but also allow the users to change them (Maness 2006). Traditional libraries are largely conservative and strive to change themselves to meet the evolving needs of their users with little or no input from the users themselves.

The researcher also used Conversation theory, Social Network theory and Network Effect Multiplier Law as well as David Lee King's Library 2.0 Ripple Effect to guide the study. More details on these are provided below.

1.3.1 Conversation theory
This theory was developed by Gordon Pask in the mid 1970s. It postulates that individuals, organizations, and even societies build knowledge through conversation; specifically, by interacting and building commonly held agreements (Lankes *et al.* 2007). Conversation theory is a valuable tool to comprehend how human beings are able to construct a common reality through conscious communication to explain the emergence of social consensus in an environment of direct social interaction (Navarro 1997).

Conversation is central to human interaction; exchanging information, making positions known, and persuading or motivating others (Klemm 2002). Essentially, knowledge is created through conversations (Scott 2001). People, organizations, states, societies converse (McIntyre 2004). Different communities have different standards for conversations. While the scientific community's conversations are formal and rigorous, teenagers use casual and often impenetrable dialects (Lankes *et al.* 2007). Conversations can be written or verbal or both. Klemm (2002) argues that written conversations have special value because writing engages the author and readers with content more rigorously than does speaking. He also adds that writing provides an opportunity for richer conversation because everyone has time to reflect on the conversation of others and plan and edit responses (Klemm 2002). Conversations can spontaneously take place between friends and colleagues. However, they can also take place over centuries, with the participants changing but the theme remaining the same, and the conversation being recorded in thousands of artefacts like books, pictures, and digital files (Lankes *et al.* 2007).

Klemm (2002) identifies four categories of conversation:
1) Monologue – exchange of opinion and supposition in which rigid positions are taken;
2) Dialogue – a community building form of shared viewpoints aimed at consensus building;
3) Dialectic – conversation aimed at distilling truth or correctness from logical argument and is largely analytical in nature; and
4) Construction – here the idea is to use conversation to create something new, often in the form of producing some kind of deliverable.

He concludes that dialectic and construction typologies of conversation are of a higher nature and more appropriate in generating new ideas leading to tangible changes.

Research libraries are in the business of knowledge creation, organization, sharing and perpetuation. Consequently, they are in the business of conversation (Lankes *et al.* 2007). The first two elements of the Library 2.0 theory as espoused by Maness (2006) imply participatory user-centered conversation in the design and delivery of library services. The conversation is conducted through multimedia Web 2.0 tools. The third Maness (2006) element envisions Library 2.0 ecosystems as socially rich, recognizing and utilizing the users' presence and contributions. Indeed Lankes *et al.* (2007) posit that

meaningful knowledge is gained from an optimal information environment which they qualify as one in which the most diverse and complete information is available to the conversants. These ecosystems grow and mutate through non-linear techniques facilitated by conversations. Research libraries seek to create optimal information environments for knowledge creation and have taken the stance that they are not merely in the job of arbitrating the conversations that occur or the "appropriateness" of the information used to inform those conversations (Lankes *et al.* 2007). Conversely, they are using conversations to facilitate a participatory service ecology. Consequently, evaluation of library services is no longer based solely on the quantities of information resources on their shelves but also by the richness of the conversations that go on in its ecosystem.

Conversation theory envisages changes in the way conversations are conducted or facilitated by the social, technological and other changes in the communities. Though both modern and ancient conversations – for example, during the time of Plato – use rhetoric and other verbal techniques (Lankes *et al.* 2007), modern ones must and have adopted emerging technologies exemplified by Web 2.0 tools to remain relevant. Consequently, technology, particularly wide area networking and the Internet, is qualitatively changing the role and form of conversations and so libraries must now consider how to facilitate and preserve digital conversations (Lankes *et al.* 2007). This supports the view held by Maness (2006) that Library 2.0 institutions are community innovative and change with the societies.

This theory helped the researcher to understand the nature of conversations that are going on within the research library communities. It also helped him to recommend how these conversations can be stimulated, escalated to the higher realms (dialectic and construction), maintained and facilitated, through the Library 2.0 model, at all levels of operation to make the services more user-centric and participatory in design and delivery; and the generated knowledge more meaningful to the users and their needs. Data for this analysis was obtained from the focus group discussions with both the librarians and the users.

1.3.2 Social Network theory

This theory views social relationships in terms of nodes and ties (Brown 2007). Nodes are the individual actors within the networks, and ties are the relationships between the actors. There can be many kinds of ties between the nodes (Gretzel 2001; Brown 2007). In its most simple form, a social

network is a map of all of the relevant ties between the nodes being studied (Wade and Schneberger 2005). The network can also be used to determine the social capital, that is, the value and capacity to have access to, add and use resources in the network of individual actors. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines.

The power of Social Network Theory stems from its difference from traditional sociological studies, which assume that it is the attributes of individual actors - whether they are friendly or unfriendly, smart or ill-informed - that matter. Social Network Theory produces an alternative view, where the attributes of individuals are less important than their relationships and ties with other actors within the network. This approach has turned out to be useful for explaining many real-world phenomena, but leaves less room for individual agency, the ability for individuals to influence their success; so much of it rests within the structure of their network (Wade and Schneberger 2005).

Social Network Theory indicates a socially networked world where people interact with each other in relationships (ties) of varying strengths. This theory helped the researcher to unravel both the existing and desirable relationships in the research library ecosystems. Critically, he sought to understand the nature (whether egocentric, sociocentric or open) of the networks as well as the factors that influence their creation and survival. The theory was also used to determine the capitals (value) of each of the nodes (libraries, librarians and users) and recommend how best they can be used to generate mutually beneficial networks. The researcher conducted a social network analysis[18] of the case libraries ecosystems using UCINET. The main criterion for the choice of software was their analytic power and ease of use. UCINET can work with different file formats (such as text, MS Excel) and handle a huge number of nodes (officially 32,767) to yield a wide variety of computations including role and other statistical analyses. Further UCINET is also open source[19] and so was cost-effective. Other data were obtained from the focus group discussions with the librarians and the users of the case libraries.

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[18] This is the process of mapping and measuring of relationships between people, groups and organizations. The aim here was to unveil the social networks in and around the case libraries, their nature and potential impact on the operations of the libraries.
[19] Category of software for which the code is public and can be readily accessed, used, modified and circulated free.

1.3.3 Network Effect Multiplier

This theory is based on Robert Metcalfe's law which states that the "value" or "power" of a network increases in proportion to the square of the number of nodes on the network. Thus, the value of any system increases exponentially with growth in the number of users (Gilder 1995; Odlyzko and Tilly 2005; Delaney 2006). Odlyzko and Tilly (2005) add that the power of the network increases not just exponentially but logarithmically with each new member. They explain that one finds it more rewarding if an acquaintance joins the network than a stranger. However big a network is, its real power lies in the connectedness of the members. The benefits accruing from the network effect may be direct or indirect (Shuen 2008) but increases as each new member joining it.

There have been criticisms of Metcalfe's law especially regarding the rate of growth with most of the critics being of the opinion that it is actually slower than what the formula proposes. However, no one has been able to demonstrate this view through a formula. Responding to the criticisms, Metcalfe himself stated in a 2006 blog entry that until someone demonstrates that the growth rate is actually slower, his law remains. However, he admits that there is a possibility that the growth rate may reduce, leading to a loss in value of networks beyond some point of growth. He suggests that this issue should be researched further to get clearer insights (Metcalfe 2006).

This law was used by the researcher to demonstrate the power of library interoperability as proposed in the Library 2.0 model. The value of a library's collection, staff, services, and so on increases exponentially through inter-networking and greatly multiplies the benefits currently being accrued through interlibrary loaning and other similar services.

The law was also used to underscore the value of the contribution of the individual users of library services within a participatory 2.0 model. The knowledge and information generation and transmission is more seamless and hence valuable than in the rigid 1.0 model currently under application (Smith 1990). The data for this was obtained from the questionnaires as well as Focus Group Discussions for both the users and librarians.

1.3.4 David Lee King's Library 2.0 ripple effect

David Lee King (2007b), on his part, uses the diagram below to explain what Library 2.0 really is and how it develops from 1.0.

Fig 1.1- Library 2.0 ripples
Source: David Lee King (2007b)

The Library 2.0 Ripples model is explained as follows:

1. *Traditional Library:* everything starts here.

2. *Augmenting the traditional library:* libraries realize that search engines, online databases, and email reference can augment their traditional services. They have not yet realized that these tools can be stand-alone services instead of simply augmenting traditional services.

3. *Change and scanning the horizon:* libraries realize that 21st century services can stand by themselves. They start reading and watching trends, they realize that to meet current and especially future demand, they need to change/grow. The library is ready to experiment with emerging tools.

4. *Pilot projects:* libraries start experimenting with emerging tools. They take Learning 2.0 courses, they start blogs. Staff members are allowed to "play" with emerging tools, start holding digital conversations, experimenting with video, or start podcasting.

5. *Customer participation:* libraries start evolving their website into a digital branch that offers participation to customers rather than just information. Conversations start taking place via the digital branch, in many different forms. The library realizes that radical change equals growth. Libraries trust their staff enough to allow them to interact digitally.

6. *Community engagement:* the goal. The library and the library's local community are actively creating a digital community via the digital branch. The library trusts the community enough to allow real-time customer participation. The digital branch is recognized as an actual "branch."

Whereas King is not clear on the possible causes of the ripple effect, it can be assumed that it is triggered by a mixture of factors including the emergence of Web 2.0 technology and the continuous change of processes involved in library services design and delivery facilitated by librarians, users, and the communities, among others.

1.4 Justification of the study

Research libraries in Kenya are facing major challenges in satisfying the ever growing needs of their users. Some of them have confirmed this desire for change through expert reviews of their services. In an attempt to respond to this challenge, they seem to be desperate for a model on which to anchor their programmes for change. Some have already introduced new services only to fall below the expectations of the users. This research project sought to fill this gap by providing the much needed theoretical frameworks and action plan to facilitate the libraries meeting their challenge to change.

Though a myriad of research projects have been undertaken on the modernization of libraries using emerging information and communication technologies, most of these studies have focused on peripheral issues such as digitization, automation and security, to mention but a few. There are very few studies that have sought to interrogate models of library service and how they ought to fit in the new technological environment. The present study was one of the few studies that sought to investigate the models of library services' design and delivery with a view of adjusting them to meet the dynamic user needs.

Further, given that Library 2.0 is a relatively new concept, there is very little academic research conducted in this area. The researcher only identified one such item of research that was conducted by Michael C. Habib for his Master's thesis at the School of Information and Library Science of the University of North Carolina at Chapel Hill in November 2006. Titled "*Toward Academic Library 2.0: development and application of a Library 2.0 Methodology*", the study investigated the origins and promise of Library 2.0 model, its application to and impact on the academic libraries. No study on Library 2.0 and research libraries has been identified. There are even fewer Library 2.0 research studies and projects in Africa. Only one such study on the application of the Library 2.0 model in African libraries conducted by Dr Heila Pienaar and Ms Ina Smith from the University of Pretoria in 2007 was noted. This study also focused on academic libraries. This was the only research study, as at the writing of this report, to interrogate the potential of the Library 2.0 model for research libraries in sub-Saharan Africa.

1.5 Assumptions

The researcher made the following assumptions:

1. The growing ubiquity of ICT tools and Internet access will gather momentum in Kenya in the next three to five years thus increasing the number of people with portable Internet connectivity beyond office premises;

2. The cost of access of Internet connectivity will continue to reduce making the use of the Internet as a means of communication more realistic and cost-effective;

3. The quality of Internet access will continue to improve and availability of broadband facilities will become more ubiquitous in the next three to five years especially with the current laying of fibre optic cables and offshore submarine cables in the continent;

4. The Freedom of Information bill currently in the Kenyan Parliament will be passed in relatively the same state as it is now; and

5. The parent institutions and the case libraries will continue to exist in more or less the same conditions during the study.

1.6 Limitations of the study

Given that this topic of study is new, the researcher was unable to get adequate literature on the same. He had to rely on just a handful of books but was able to compensate for this lack by utilizing

electronic publications including blog articles, conference papers, journal articles, mailing list discussions and concept papers, among others. These publications were selected based on criteria such as authority, currency, verifiability, accuracy and uniqueness, among others.

The study was also limited in terms of theories. This is also because the discipline is relatively young. The researcher had to borrow theories from other areas of social science to guide the study. He hopes that the anticipated rise in research studies in this area will lead to the development of theories specific to Library 2.0.

Other limitations revolved around time and resource constraints that restricted the researcher's ability to conduct extensive research not just with the five cases but possibly with all research libraries in Kenya. Indeed, perfect generalizability of the data collected to all research libraries in Kenya is not possible given the uniqueness of each of the institutions. However, it can still be applied given that they basically have the same mission and operate under relatively similar environments.

All in all, the researcher did what was possible and is certain that the findings of this study will stand rigorous research evaluation and be applied in real life.

The ethical considerations which the researcher made during this study are discussed in Chapter Five (item 5.7) on page 150 of this thesis.

1.7 Dissemination of the study results

The results and report of this research study will be disseminated through:

1   Libraries;

2   Journal and general press articles;

3   Conference papers;

4   Seminar/workshop presentations;

5   Public and other debates; and

6   Stakeholder meetings.

1.8 Dissertation outline

This section outlines the structure of the thesis and highlights the content of the various chapters.

Chapter One – Introduction

This section of the dissertation provides background information on the project such as the background of the topic, statement of the problem, objectives of the study, questions answered by the research, justification of the project, dissemination channels of the findings as well as the relevance of the study to the current body of knowledge in library and information studies. This section also contains definitions of important terms and concepts.

Chapter Two – Research libraries in Kenya

This section contains a review of the services offered by research libraries in Kenya. It also includes an assessment of their user-centricity and effectiveness in meeting the needs of the users. A brief history of research libraries in Kenya as well as an overview of the selected five – AMREF, ILRI, ICRAF, KEMRI and KARI - is also given. This section also discusses the challenges facing the modern research library in Kenya and how they are attempting to cope with these especially in light of the development of ICT and information access policies. It also proposes benchmarks for research library services and operations in Kenya.

Chapter Three – Literature review

This section discusses the models of service that libraries could utilize to design, deploy and evaluate services to their users. This gives background information on which comparisons can be made to facilitate selection of the best alternative.

Chapter Four – Library 2.0 model

Here, Library 2.0 Model is introduced. The origins, fundamentals, basic principles and theories are discussed in details. This section also discusses the relationship between Library 2.0 and Web 2.0 and how they are likely to change the communication and information services landscape globally. Examples of how this new generation of new media has been used elsewhere are also discussed.

Chapter Five – Research methodology

This chapter outlines the research methods, data collection techniques, data analysis methods, sampling criteria and sizes as well as results presentation. It also discusses the advantages of the methodology adopted and relates it to the research questions and objectives.

Chapter Six – Research findings

This section presents the results of the study. The researcher has ensured that data and results that relate to the research objectives and questions are appropriately analyzed and reported. Narrative and graphical reporting techniques are appropriately used.

Chapter Seven – Discussion of research findings

Interpretation and discussion of the results is presented in this chapter. It also contains the conclusion on whether Library 2.0 is an option for the research libraries in Kenya or not. All findings that relate to the research questions and objectives are fully discussed.

Chapter Eight – Conclusions and recommendations

This section discusses the social, financial, technological, organizational, and other challenges research libraries in Kenya are likely to face in their endeavour to adopt Library 2.0 model. It also presents a detailed strategy of how best to implement the Library 2.0 model in research libraries in Kenya. This is a working strategy that is recommended to the libraries for domestication and use.

1.9 Summary

Examples of change in librarianship through the years are numerous. Some of these changes were catalyzed by political, technological and socio-economic transformations in the larger society thus triggering change in library user information needs and how to satisfy them. Similarly, there were a number of changes facilitated by the librarians themselves in their professional pursuit. Other changes, however, were triggered by a combination of environmental and professional factors. All in all, changes in libraries have been motivated by the need to remain user-centric and to deliver relevant services effectively.

We are standing on the threshold of yet another change necessitated by current user needs and wants. Is Library 2.0 the most suitable model to synergize technological, societal and professional

advancements to yield an appropriate service model for this generation? Furthermore, can Library 2.0 be applied to research libraries in developing countries?

This chapter provided the background to this research study seeking to answer the questions above. It also outlined the problem, objectives and specific research questions that were investigated by the project as well as the theoretical framework that guided the study. It also discussed the basic elements of Library 2.0 as well as the nature of change it represents. A number of controversies around the model were also highlighted. Only two studies on this topic have been identified. However, both studies focused on academic libraries. This study, therefore, sought to fill the knowledge gap regarding the application of Library 2.0 to research libraries in developing countries.

CHAPTER TWO – RESEARCH LIBRARIES IN KENYA

2.0 Introduction

Library specialization began earlier than many people imagine and each historical epoch is characterized by a definite library typology depicting the influences of the time (Ocholla 1993). Some library specialization can be traced back to the early 18th century in Europe and North America (Shera 1966). These were libraries with special collections on specific disciplines. The first ones to emerge were owned by historical societies, theological societies and temples/mosques, legal associations and agricultural associations. Shera (1966) explains that of these, the closest to special libraries, as we know them today, were the mechanics' and apprentices' libraries of the industrial age of which the Mechanics' and the Working Men's Institutes were the most popular. Several of these institutes were established in Europe, North America and Australia to provide evening learning facilities – including a special library – for artisans (Solly 1904; Baggs 1991; Morris 2006). Besides these institutes, Shera (1966) also mentions Philadelphia Library as a good example of such libraries which kept a rich collection for young artisans to improve their technical skills and efficiency. He adds that such special libraries emerged due to the inability of the general library collections and techniques to meet the special needs of defined groups of people. Shera (1966) also alludes to the superiority and efficiencies of special libraries in breaking the barriers to scientific information flow compared to the general ones. This view was also exemplified by the early closely-knit research networks such as the Invisible College pioneered by renowned researchers like Robert Boyle[20], John Wilkins[21] and Robert Hooke[22], among others, which facilitated seamless intellectual exchange of ideas through novel means such as "marginalia"[23] and word-of-mouth techniques which the general libraries of the time had not embraced (Hunter 2004; McKeown 2004; Weissmann 2007).

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[20] Robert Boyle was a chemist who is well known for his law on proportions of gases. He is considered the father of Chemistry. He is reported to be the first scientist to conduct controlled experiments and publish the results in detail (Macintosh 2006).
[21] John Wilkins was best known as the first leader of the Royal Society, an organization that sought to promote scientific research and knowledge development (O'Connor and Robertson 2002).
[22] Robert Hooke was a natural philosopher who is considered the father of microscopy. He is credited with coining the term "cell" to describe basic unit of life (Miles 1996).
[23] These were annotations written in the margins of personal copies of books that were loaned, given, or sold from person to person (Archers Books 2008; Collins 2009).

Some scholars also point out that some early special libraries were also owned by families. A good example of such libraries operated in the ancient Timbuktu civilization; some reportedly dating back to the pre-Islamic days. The Timbuktu libraries contained hundreds of manuscripts on diverse topics (such as religion, astronomy, botany, law, medicine, mathematics, among other subjects) which were written either in Arabic, Fulani or other North-West African languages. Though the Timbuktu libraries later expanded to universities such as Koranic Sankore University and several madrasas,[24] many of them were private and basically owned by rich families and scholars in the town and were used for personal development and to preserve family secrets and traditions. Many of the Timbuktu libraries and their collections still remain the private property of individual families to date (Minicka 2006; Abraham 2007; Haidara and Taore 2008). The existence of these special libraries testifies to the fact that different circumstances and needs often catalyze the development of specialized libraries to deliver unique information services of the moment.

Ocholla (1993) distinguishes "type" from "kind" of libraries. He explains that classification of libraries has developed into hierarchical structures with vertical and horizontal categories. He clarifies that vertical hierarchies form the type whereas the horizontal ones form the kind. Types are more generic than kinds (*See Fig. 2.1*). He concludes that kinds are sub-sets of types. He also supports the view that library typologies have developed through the years depending on the socio-economic, political and technological environments in the society at the time. He categorizes library development periods as prehistory, middle ages, and modern period. Ocholla (1993), Babcock (1971) and Manzuch (2007) list the main library typologies of the modern period as academic, school, special, public, research, private, national and government libraries. Manzuch (2007) also points out that the different library typologies are basically determined by the services the library seeks to offer, its size and type of collections and explains that national libraries, for instance, are known as state depositories of cultural heritage; public libraries are important sources of local history and serve users on the basis of geographical criteria (such as location, place where he/she lives). On the other hand, academic, research and special libraries hold specific collections targeted at research, studies and professional activities. Low (1996) explains that libraries do not usually belong to a "pure" typology. She adds that most of the libraries exist as hybrids of the various typologies depending on the contexts in which they operate. Though the public library, the special library, and the research library, for example, are all different in various ways, they are all united in one way or

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[24] The term is Arabic for "school" but is commonly used to describe Muslim education centres (Tristam, 2009).

another in their role in acquiring, organizing, and providing effective access to recorded knowledge and other information to facilitate learning (Swanson 1979; Ocholla 1993; ACADIA[25] 1998).

Fig. 2.1 – Library typology hierarchy
Source: Researcher

Gunasekara (2005) defines a research library as a reference library which provides specialized information facilities where exhaustive investigation on a particular field is carried out. He adds that research libraries are established under research institutes, which conduct research in various fields to fulfil their goals and objectives. Kent, Lancour and Daily (1978) agree with Gunasekara (2005) and state that research libraries should collect information on the area of research pertinent to the institutes in greater depth than any other library. Thus, a research library can be perceived as a library that contains an in-depth collection of materials to support research on a specific discipline or a combination of disciplines. To achieve this mandate, research libraries typically hold, or have established access to, both primary and secondary information resources and data which include conference proceedings, journals, technical reports, and standards, among others. Kent, Lancour and Daily (1978) also explain that research libraries can exist as 1) reference libraries; 2) lending libraries; or 3) academic research libraries.

Heaps (2005) while referring to the Raymond Burton Library for Humanities Research[26] explains that apart from specialized collections that research libraries hold, the research librarians also offer

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[25] ACADIA stands for the Association for Computer Aided Design in Architecture.

specialized subject services than are offered by librarians in other library typologies. She adds that research libraries also offer value-added services such as document delivery as well as an editorial room for journal editors which facilitates effective and convenient service delivery to the users.

Railiene (2005) explains that research libraries differ from other libraries in two major ways:

1) **Collection policy** - Research libraries collect and stock information sources that cover the areas of interest in greater depth than other libraries. Their holdings also include scientific literature and historical collections as well as special literature collections.

2) **Research activity** - Research libraries perform research in librarianship and other congener sciences. As the keepers of valuable collections, librarians also analyze and publish them. Scientific activities in research libraries are either performed by special research departments, or by entire staff.

True (2009) asserts that the purpose of a research library is to enable researchers to immerse themselves in the available documentary evidence and then to make the product of their investment of time, judgment and skill available to the public through a book, article, thesis, film, television (TV) production, website or blog. Thus, a research library becomes an active partner with authors and publishers in creating the next generation of public knowledge.

Kent, Lancour and Daily (1978) also suggest that research libraries have exerted a lot of influence on the development of librarianship as a profession. They attribute the greater influence of this type of library to the immense pressure on the research libraries to offer quality services to their users. Specifically, they suggest that research libraries have influenced the development of computerized cataloguing systems; digitization of library collections and services; and advancements of the Anglo-American Cataloguing Rules, among other developments.

Though the distinction is slim, research libraries are different from university libraries in that the former are attached to individual research institutions pursuing a single or a combination of closely related areas of study (Kent, Lancour and Daily 1978). Some scholars also draw a distinction between research libraries and curatorial centres. Research libraries support research and often focus on the latest resources. They also emphasize use rather than preservation which is the hallmark of

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[26] This library is at the University of York in the United Kingdom.

curatorial centres. Curatorial centres, on the other hand, focus on historical collections (Shera 1966; Swanson 1979).

Kent, Lancour and Daily (1978) hold the view that research libraries have been very unfriendly to the general public. They point out that research libraries ordinarily turn away the casual user whenever possible and that they have several restrictions on the age and purpose of the user which are essentially meant to ensure that undue "wear and tear" on the resources, staff and plant of the library is minimized. They also add that the libraries give priority to researchers and accord them more privileges like recalling information resources from the other users. For instance, members of the public who are perceived to have lesser research needs are restricted, to a great extent, in what collection or services they can use. Kent, Lancour and Daily (1978) also allude to preferential treatment research libraries have received in the past in which their performance is rarely questioned. They also add that even in authoritarian regimes, research libraries have generally received support for collection development; particularly, they have been able to acquire forbidden material with much ease. They explain that even Adolf Hitler permitted German research libraries to collect books that the other libraries or individuals were not allowed to possess.

It is obvious from the foregoing that there are diverse opinions on what constitutes a research library. However, it is evident that a research library is defined by its scope and the depth of its collections (more in-depth coverage about less and less); the specialized service portfolio aimed at supporting specific research activities; attachment to a research institution; and relatively smaller size compared to the public, national or academic libraries but often bigger than school libraries. It is also evident that research libraries are often proprietary and are designed to meet the special needs of researchers in specific research institutions.

2.1 Characteristics of research libraries

Modern research libraries should exhibit the following characteristics:

2.1.1 Proximity

Ocholla (1993) explains that location is a critical determinant of library typology. He adds that location influences the functions of a library and determines its success in fulfilling its mandate. Research libraries are normally located within close reach of the researchers. Many researchers assert that a research library should be in a convenient place (Brown and Swan 2007). Ordinarily, they are

located on the campuses of the research institutions and in some instances are decentralized to offer services at more than one research station. Mrs. Sarah Mang'oli, the Acting Chief Librarian at KEMRI,[27] asserts that this close proximity characteristic distinguishes research libraries from other typologies. She explains that this is why KEMRI offers library services at all its major research stations such as Kisian in Kisumu[28] and at the Kenyatta National Hospital[29] in Nairobi. Gluck *et al.* (2002) add that decentralized services enable researchers to access library services at their convenience and often facilitate personal service delivery. Another element of proximity which is exhibited by research libraries is the uninterrupted offering of some key services. ILRI InfoCentre is one of the research libraries that offer certain services on an uninterrupted basis.[30] For instance, the Internet café on the Nairobi campus is open 24 hours a day to researchers. Besides, all online services are also accessible to researchers all the time.

2.1.2 Collection

Most research libraries used to focus more on acquiring as many physical publications as possible. These acquisitions would include books, manuscripts, correspondence, journals, films, videos, sound recordings, maps, theses and dissertations, among other information resources. Traditionally, the success of research libraries was measured using criteria based on the size of their print collections (Franklin 2007). In a sense, they worked to own the collection (Lougee 2002). Franklin (2007) explains that the number of volumes held, number of volumes added, and the number of current serials received, were some of the critical elements of research library evaluation. This tradition continues but there is a steady shift from the tangible to intangible resources. Franklin (2007) explains that there are many developments which have influenced current collection development policies in research libraries. These include a shift by many research libraries from a collection ownership to an information access model; the growing accessibility of content available freely on the web and through open access to scholarly publications; access to electronic resources among research libraries through consortia; cooperative collection development; and the emergence of shared storage facilities that reduce individual research library's volume counts through the elimination of duplicate holdings. Today, most research libraries endeavour to "acquire" access to

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[27] This is based on a preliminary interview with Mrs. Mang'oli on 8th July 2009 at the KEMRI main library.
[28] Kisumu is about 300 km from Nairobi and hosts researchers working on various tropical medical issues.
[29] This is the biggest referral Hospital in East and Central Africa in which KEMRI conducts research on various medical conditions and emergencies.
[30] This is based on information obtained from preliminary interviews with Mrs. Grace Kamau, the ILRI Nairobi campus Head Librarian on diverse dates between May and July 2009.

information resources electronically beyond the library walls through a collection federation[31] (Lougee 2002; Franklin 2007). St. Clair, Harriston and Pellizzi (2003) add that the number of volumes held by a research library is not necessarily a true reflection of the levels of services it offers. The major benefits of this collection management approach are cost reductions associated with reduced requirements for ownership, storage and transport of the collection. Again, users access the latest information – almost as soon as it is published – and can share the same information source at the same time depending on the terms of access. The main disadvantage, however, is the loss of primary responsibility for the collection and lack of control over its longevity mechanisms such as the archiving systems accessible to the users (Baldwin and Mitchell 1996; Lougee 2002; American University Library 2005).

Findings of this (current) research attest to the fact that modern research libraries have very limited physical collections fitting into just a dozen or so shelves. For instance, ICRAF has 20,171 journal titles – of which more than 95 percent are only available online – compared to 25,192 books.[32] It is noteworthy that most of these books are not purchased; they are either donations or in-house publications. A large percentage of the annual budget is used for journal subscriptions.[33] Mrs. Grace Kamau of ILRI also explains that she has weeded out several titles of print publications from her library in the recent past and has thus reduced the number of books in the library drastically. There is clear prioritization of journals over books in these libraries. The justification for this prioritization is the fact that researchers need current information that can only be relayed through journals, the majority of which are now available online. Consequently, the bulk of the collection is intangible; existing as a service provided by another institution. Efforts – like the ones sponsored by Google[34] and several others undertaken by individual research libraries – are underway to digitize as many information resources as possible (Lavoie, Connaway and Dempsey 2005). As a consequence, most of the libraries now require researchers to submit copies of theses, dissertations and other scholarly publications in digital format; there is less focus on the bound copies. Most research libraries also

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[31] This is a collection sharing system in which libraries facilitate access to information resources held by other organizations on a need basis. Individual libraries do not have to purchase the resources but use the linkages to offer access to their users when it is required (Lougee 2002).

[32] These statistics are findings of preliminary interviews with Mrs. Jacinta Kimwaki, the Head Librarian at ICRAF on diverse dates in April and May 2009.

[33] See a model research library budget in Appendix 3. This budget was prepared through input by Mrs. Grace Kamau of ILRI, Charles Owino of AERC, Eunice Njonge of KEMRI, and members of KLA (through mailing list contributions).

[34] Google Print Library Project (GPLP) was launched in 2004 to digitize and make available online print collections currently held by Harvard University, the University of Michigan, Stanford University, the University of Oxford, and the New York Public Library (Lavoie, Connaway and Dempsey 2005).

hold multimedia information resources (Ferguson 2000; Heaps 2005) such as web pages; Intranet pages and applications; Digital Versatile Discs (DVDs) or Video Compact Discs (VCDs); audio tapes and Compact Discs (CDs); to mention but a few (Huggins 1950; Coale 1965; Roth 2002; St. Clair, Harriston and Pellizzi 2003). Brown and Swan (2007) assert that most science researchers in the United Kingdom prefer digital content. This preference perhaps explains the perceived reduction in physical library visits and physical collection use. With the rising presence of digital information resources – first the electronic journals and now digital books – there is pressure on the research libraries to prioritize these information resource formats in their collection development policies. With this trend, it is not unreasonable to envisage a scenario in which research libraries will have predominantly more digital than physical content in their collections in the near future. Building digital collections is now a major interest for research libraries (Brown and Swan 2007).

Franklin (2007) also explains that research library collections normally include a large proportion of locally created information resources such as technical reports, research reports, conference reports and other content arising from research activities in the organization. The quality and quantity of these "special collections" are normally used as indicators of the level of success of research in these institutions. Kent, Lancour and Daily (1978) also hold the view that one of the key distinguishing characteristics of research libraries is that they hold information resources covering select topics in greater depth than other libraries. Given that they support scholars who work at the cutting edge of their fields, they can only be useful if they contain information resources that discuss the topics of interest in detail. Of course, the accomplishment of this role requires more adequate finances than most libraries can afford hence the need to collaborate with like-minded libraries in developing and disseminating information resources (St. Clair, Harriston and Pellizzi 2003).

Palmer (2004) suggests that research libraries ought to have thematic collections. She explains that thematic research collections are basically digital resources on a single area of research interest located in one place. She argues that this collection development approach has been necessitated by the realization that in the past scholars produced documents from source material held in the collections of libraries, archives, and museums; now they are producing specialized scholarly resources that constitute research collections. Unsworth (2000) agrees with Palmer (2004) and explains that thematic collections are: 1) largely electronic; 2) constituted of heterogeneous data types (multimedia); 3) extensive but thematically coherent; 4) structured but open-ended; 5) designed

to support research; 6) interdisciplinary; 7) primary in nature; and 8) usually multi-authored. From the foregoing, it is evident that thematic collections are digital aggregations of primary sources and related materials that support research themes. Palmer (2004) concludes that in taking a thematic approach to aggregating digital research materials, research libraries are producing circumscribed collections, customized for intensive study and analysis in a specific research area. This collection development approach facilitates the creation and dissemination of unique research collections that accurately and promptly meet the information needs of the researchers.

2.1.3 Service portfolio

Kannappanavar and Vijayakumar (2001) assert that libraries exist to offer services to the users and that the quality of the services offered by a library is the basic determinant of its success or failure. Though research libraries offer a full-range of library services (St. Clair, Harriston and Pellizzi 2003), Young and Lund (2008) explain that the services offered are unique and go beyond those offered by general libraries. Some of these services include:

1. **Reference** – reference services offered by research libraries are aimed at helping the researchers find information on specific topics; develop research strategies for papers and projects; search for information on library catalogues, databases and Internet; locate facts and statistics; answer questions about the library's services and information resources; and refer the researchers to information sources beyond the library (Brown and Swan 2007). The research librarians offer in-depth reference services and generally respond to users' questions either by phone, email or other communication methods. The research library users do not just ask simple questions; they ask challenging questions and engage the librarians at a higher intellectual level than ordinary users (St. Clair, Harriston and Pellizzi 2003). Similarly, they prefer to discover relevant content independently rather than being directed to it by the librarians (Brown and Swan 2007). The emphasis here is that the reference service in a research library is aimed at empowering the users to seek and find information by themselves and is offered anytime anywhere; what some scholars now call location and time independent services (Pietrobon 2009). Brown and Swan (2007) report that research librarians in the United Kingdom are already working with a number of researchers to develop their capacity to search, access, evaluate and use information especially from digital sources. They also report that researchers are finding these efforts useful and have been keen to attend such training sessions. To provide effective reference

services in a research library calls for innovative services going beyond face-to-face modes (De Groote *et al.* 2005), and including instant messaging, online chat, video conferencing, electronic research assistance and telephone (especially mobile phone) assistance (American University Library 2005; Cummings, Cummings and Frederiksen 2007). It follows, therefore, that research libraries should develop appropriate interfaces, tutorials, Intranets, frequently asked questions, and other online guides to facilitate asynchronous and distributed access to their services and information on a 24 hour basis. Some scholars also propose systems that enable librarians to "capture" the users' workstation and guide them through the information resources in a concept known as co-browsing (Lougee 2002). It is also important that these systems should allow users to make requests using natural language and are enhanced to reduce incidents of malfunction that frustrate the users (Pietrobon 2009). Cummings, Cummings and Frederiksen (2007) point out that though asynchronous and synchronous digital communication systems discussed above have been embraced by most research libraries, there are cases where the "hype" about them has not been matched by actual use. They cite a study conducted by Steve Coffman and Linda Arret (2004) at Washington State University (WSU) which revealed that though chat systems were popular with other libraries, their introduction at WSU did not meet expectations and they were discontinued soon afterwards. Cummings, Cummings and Frederiksen (2007) conclude that recent evidence has shown that despite the library community's enthusiasm for virtual reference services, this method has not been universally popular with users.

2. **Reference management** – Citation has always been a crucial part of research when it comes to accreditation for intellectual property. Though the maintenance of these references has mostly been the sole responsibility of the author, research librarians are steadily being involved in the collection, maintenance and formatting of references for researchers (Le Roux and Burke 2008). This service goes further to help researchers manage references to electronic sources which are normally transient (Eysenbach and Trudel 2005). The use of specialized software such as Endnote, Connotea, CiteULike, Reference Manager and Refworks is advocated (Le Roux and Burke 2008). The role of the library here would be to provide access to software as well as the training of researchers in the use of the software. According to Faassen (2004), this would enable researchers to more effectively manage their references so that 1) when an object is moved, all references to it should still be correct; 2) a user should be able to quickly identify broken references in a document; 3) a user should be

able to easily see whether an object is being referenced or not; and 4) a user should be able to get an overview of all objects that reference the current object. Research libraries may also go further and track where the papers published by their researchers are being cited as a way of demonstrating research uptake and likely impact.

3. **Research space** – Space is critical in a researcher's programme (Carroll 2009). Space requirements for research vary depending on the project and discipline of study. Researchers may on some occasions spend long hours in the library so the provision of space in a library dedicated to research is a primary requirement. Conditions within these dedicated research spaces should protect and preserve objects during research (Cumberland 1998). Such spaces are unique and, depending on the need, special treatment may be given to the users, for example, allowing them to talk, eat and drink in the spaces. This is especially useful for visiting researchers, post-doctoral fellows and graduate students who may not have office space in the institution. The spaces are also valuable for group researches in which participants can review literature, discuss findings and write reports together (Carroll 2009). Even full time researchers may find these spaces useful on occasions when they would like to dedicate more time to research and avoid disruptions in their own offices. Such spaces, however, are allocated with the understanding that they do not belong to the researchers permanently and should be observable from library staff offices – preferably having glass walls (Cumberland 1998). Most research institutions require the researchers who are allocated space in the library to justify their continued use by demonstrating research productivity, for example, through quality and impact of research (journal papers, influence on policies, among other criteria); alignment of research activities to the core mission of the organization; number of researchers involved in the project; amount of research funds awarded; and type of research conducted in the space - theoretical or computational research (Anderson 2007; Graham 2009). Cumberland (1998) explains that research space should be dedicated to research, provide adequate security for the objects/collection of research, be large enough to accommodate the needs and equipment of the research, be accessible and usable by persons with disability, have electrical and phone services as well as any other pertinent utilities necessary to meet the needs of the research functions.

4. **Information Literacy** – Kinengyere (2007) defines Information Literacy (IL) as the ability to identify an information need, locate and access the required information, evaluate, organize and apply it to address the need in question. She adds that IL encompasses

knowledge of one's information concerns and needs, and the ability to identify, locate, evaluate, organize and effectively create, use and communicate information to address issues or problems at hand; it is a prerequisite for participating effectively in the information society, and is part of the basic human right of life-long learning (Breivik 1991; Rader 1995; Kinengyere 2007). Breivik (1991) adds that in this information age, it does not matter how well people can analyze or synthesize; if they do not start with an adequate, accurate, and up-to-date body of information, they will not come up with a good answer. IL programmes in research libraries are aimed at empowering the researchers to make optimal use of the information resources in the libraries. IL is offered in research libraries through individualized support on how to use library resources such as databases, digital resources, print journals, and catalogues; workshops; training programmes such as information management competency courses; and reference management courses (Rader 1995; Kinengyere 2007). Librarians manage the entire IL process including developing teaching materials, guides, teaching methods, library skills tests, web-based tutorials and other online teaching modules (Rader 2002). Effective IL programmes lead to increased usage of library resources, reduced time spent on research projects, and better quality of research reports, among other benefits. Essentially, research librarians impart information skills to all levels of researchers to ensure that they gain information fluency to enable them become productive and effective information users (Rader 2002; Kinengyere 2007). Some scholars also propose that apart from the ordinary information literacy courses on how to make the best use of the library resources, researchers should also be trained on open-source publishing; e-journals; Curriculum Vitae (CV) development and interview skills. They should also be trained on the use of the ISI[35] citation indexes on Science, Social Sciences, and Arts and Humanities which are essential for researchers who need to know who is citing who and where the source can be found. Rader (2002) also asserts that research librarians offer more intense IL than their counterparts in the other library typologies. Rader (1995) points out that librarians take IL seriously because they understand the value of information literate users in facilitating the accomplishment of the ultimate goal of the research institution. The service is like the key that unlocks the treasures of the library.

5. **Management of research outputs** – Dissemination of new knowledge lies at the heart of research projects and given that research librarians are involved actively in the research

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[35] ISI stands for Institute for Scientific Information.

projects of their users, it is prudent that they also offer advice on where to publish, how to track the impact of the research publications, for example, through citations, and creating an inventory of the research outputs (Hahn 2008a). Lougee (2002) and Hahn (2008a) also propose that research libraries should actually be actively involved in the publishing of the research findings. Hahn (2008b) explains that research libraries used to contribute in the scholarly communication cycle only after the works were published by merely organizing and managing them to ensure easy availability and longevity. She asserts that this role needs to change and research libraries need to move closer to the research process and the scholarly communication that occurs during research by moving up in the cycle through publishing. Hahn (2008a) reports the findings of a 2007 study conducted by the Association of Research Libraries (ARL) to investigate the prevalence of publishing services among its members in which 44% of the 80 responding ARL member libraries reported they were delivering publishing services and another 21% were in the process of planning publishing service development. Only 36% of the responding institutions were not active in this arena. Further, 88% of the libraries involved in publishing focused on journals; 79% on conference papers and proceedings; and 71% on monographs. Ryan (2008) explains that library publication services are developed in ways that are consonant with research library service culture, including close consultation with researchers and frequent use of partnerships. Peer reviewed works dominate the materials published by libraries. The works are published either online or in print ostensibly to extend outreach and keep the costs low. There are some cases, however, where the publishing role is played in a more significant way with the library employing editors, typesetters, graphic designers, among other publishing professionals, and running a fully-fledged publishing unit managing content collation, presentation, and distribution. In most cases, however, libraries partner with specialist publishers to realize this. The Council on Library and Information Resources (CLIR) (2008) agrees with Hahn (2008a) that research libraries, by offering publishing services, are addressing gaps in the traditional publishing systems and are not necessarily replicating traditional publishing. Nonetheless, most research libraries face myriad challenges with their publishing initiatives. One of the greatest challenges they face is budgetary constraints as most libraries have to fit the publishing expenses within their annual budgets (Hahn 2008b; Knight 2009). Other challenges include general academic distrust, a system of reputation-based incentives that favour established scholars, as well as an overwhelming amount of content through which to

sort (Knight 2009). Besides, Bankier and Smith (2008) also point out that most researchers do not think of the library when they want to publish. They also suggest that research libraries need to actively inform the researchers that the libraries can offer competitive publishing services and that the library can be a successful publisher. They also advise the libraries to consider publishing as a long-term venture which, though it may be hard at the beginning, gets easier with time and experience.

6. **Resource exchange** – Gunasekara (2005) suggests that one of the prime roles of a research librarian is to create links with local and foreign research institutes to exchange information sources needed for research. Beaubien (2007) explains that Inter Library Loan (ILL) services, for example, supplement a library's collection by obtaining materials needed for research, scholarship and private study that are not available at a user's home institution. She explains further that research and academic libraries place ILL requests on behalf of faculty, staff, and students for returnable items (such as books, audiovisual items, and microfilms) and non-returnable items (such as copies of journal articles, and conference papers) usually to obtain material beyond the scope of the collection or to support a specialized research interest of one of their users. Gunasekara (2005) also explains that the research librarian has to develop trust and a good mutual understanding with fellow librarians to obtain the best results from the resource exchanging process. He adds that if this process operates at optimum level, the research institutes would be able to save foreign exchange while utilizing the privilege of obtaining local, regional and international publications. Research libraries set reciprocal document exchange arrangements with a limited number of libraries due to the costs and risks involved (Beaubien 2007). St. Clair, Harriston and Pellizzi (2003) also point out that ILL and/or document delivery services are considered primary and essential services in most specialized research libraries. They add that contracts with full-text vendors are standard in such libraries with the costs charged back to the individual projects as indicated by the researcher(s) making the request. They also explain that in some libraries, the numbers of ILL requests are dropping, since users have e-journals, e-reports and other digital information resources, and do not seem to need to make as many requests as they did in the past. Beaubien (2007) also points out that interlibrary loan services are expensive and are only offered in cases where there is no other way of obtaining the information source. She also explains that articles considered for ILL are those that the libraries cannot obtain either

because of their unavailability or uniqueness and are requested on behalf of core (primary) users only.

7. **Internet access** – Research libraries offer Internet access to enable the researchers to obtain the latest information in their areas of research. The Internet as a vast network of information and resources enables the libraries to provide information services beyond the confines of their own collections (MacKeen 2009). Normally, access to the Internet is provided either through library desktop computers or dumb terminals. However, network connections into which library users can plug their own laptops and access the Internet are increasingly becoming popular in research libraries. Use of the Internet in research libraries is generally free. However patrons are normally expected to pay for additional services such as printing of information downloaded from the Internet (in cases where copyright provisions permit reproduction). There are varied opinions on whether the library should allow full access to the Internet or just allow users to utilize it to access specific sites. Some people argue that restricting Internet access "babies and dumbs-down" this service in such a way that makes those using it incapable of being effective (American Library Association 2000; DeLaney 2005). Others also argue that Internet content restrictions, through filters, also block important ("perfectly legitimate and valuable") content that users need especially on health, science, politics and social sciences (Bansal 2007). On the other hand, there are those with the view that Internet site restriction is good because it saves the time of the users, protects the right of the other library users, saves the library bandwidth (most of the restricted content is "heavy" and takes time to load), saves library costs and keeps the users focused on research only while in the library (Miller 1995; Bansal 2007). Library patrons access the Internet at their own discretion and they are responsible for any access points they reach. In some instances, use of an Internet access terminal may be limited to specific periods of time to enable equitable use, especially where there are other users waiting for the service. It is also incumbent upon the librarian to develop appropriate interfaces through which the users can access important research content, for example, through library web pages, Intranets or online databases. The librarian can also include free periodicals and other information packages on the Internet for the researchers (Gunasekara 2005). Most research libraries have an Internet usage policy which spells out what users can and cannot do with the service. Ordinarily, such policies include the responsibilities of the users (such as taking charge of their own searches) and those of the library (such as provision of necessary

interfaces to Internet sites); prohibited activities (such as deliberate access and viewing of adult material, Internet crimes such as spamming or hacking, gambling, among other vices); and general guidelines to enable the users to reap maximum benefits from Internet resources (American Library Association 2000; MacKeen 2009; Viklund 2009).

2.1.4 Staffing

Research libraries operate in diverse contexts. Consequently, staffing requirements would vary from one library to the other based on the mission of the parent institution, the extent of services offered, the number of hours the library is open per week, as well as the size and composition of the population served (Medical Library Association 2000). However, it is important to note that research librarians are collaborators of the researchers. Ideally, these librarians need to be at the same level or close to the level of the researchers. In fact, Kent, Lancour and Daily (1978) are of the view that research librarians should be trained better than their colleagues in the public and school libraries, should have graduate degrees and be capable of offering more highly professional support. Some scholars also hold the view that a research librarian should also be trained in research to offer superior services. They propose that the research librarian should have a good knowledge of research problems and methods in the specific area. They also suggest that the research librarian should be aware of the latest findings in the research areas the library seeks to support (Kent, Lancour and Daily 1978; Salvesen 1999; St. Clair, Harriston and Pellizzi 2003). Salvesen (1999) concludes that research libraries should employ people who can engage in an active dialogue with the researchers on what information requirements the different projects have. He adds that in order to activate such a dialogue, the research librarian should have such a level of professional competence that makes the dialogue meaningful, should be aware of developments within the field, and should have a personal knowledge of research methods and common theoretical problems in the field.

All the professional librarians in a research library should have appropriate researcher status depending on their qualifications and experience. Particularly, these professional librarians should have access to research funding and should be rewarded for research excellence – for example, through promotions – just like their full-time research counterparts. The librarians should also enjoy working conditions similar to their equivalent researchers including schedules of work, research leave and policies and funding for attending conferences (Medical Library Association 2000).

Youngman (1999) also suggests that libraries should have a mix of senior librarians and recent graduates. He reasons that most libraries are undergoing various types of change. He further suggests that senior librarians are good at managing change but adds that the "younger" librarians bring new but necessary skills that senior librarians may not have. Some of these new skills include web publishing and ICT systems management. Some library scholars such as Fourie (2004) seem to agree with this view and propose a review of librarianship curriculum to include courses that would impart these skills. Youngman (1999) points out that with most libraries adopting ICTs, there is a great need for librarians with advanced ICT skills. McDiarmid and Auster (2004) also suggest that engaging volunteers is an option for better staffing especially in situations where funding is a challenge.

2.1.5 Physical space

Leighton and Weber (1999) explain that designing a research library building is not an easy task. The difficulty of design can be attributed to the fact that library buildings are complex and expensive to construct. Further, the buildings may not be changed easily as this would be a very expensive venture to attempt. So the design must be able to stand the test of time and meet the dynamic needs of the users and library institutions for a long time. Consequently, librarians and all the people concerned with managing the development of library designs are careful to ensure that the design can be suitable for a reasonable period of time. However, with the increasing use of electronic rather than print resources, there is less need for shelving which is not only expensive and heavy but also necessitates extra-strengthened floor plates and columns for support. A largely electronic resource would not need this heavy construction, rendering library building simpler, less expensive and more amenable to change. Nonetheless, it should be noted that each library is unique and should adopt a design which satisfies the needs of the users and the parent institution effectively.

Ordinarily, research librarians may not have the privilege of being part of the original planners of the buildings especially because research library spaces are purposely built only on very rare occasions. However, research librarians should ensure that whatever space they get is spruced up and ergonomically suitable for research. The library facility should make the users feel welcome and at home. It should have good lighting as well as adequate ventilation with temperature and humidity control for both the comfort of users and preservation of the information materials. The setting should be quiet with appropriate carpeting to provide suitable acoustics and aesthetics. Similarly,

clocks and adequate informational signage should be conspicuously posted (Medical Library Association 2000). The following guidelines would be useful when planning space for a research library:

1. More room should be left for reading and meetings with shelves taking less than 30% of the available space. This is premised on the fact that most research libraries are steadily moving towards digital collections. Further, compact, mobile and adjustable steel shelves should be used to minimize the shelving space. Traditionally, shelves take the largest amount of space in most libraries. This should not be the case for modern research libraries (Jensen 2002).

2. Research libraries should also have ample space for seating – up to 40% of the entire available space is recommended for seating (Medical Library Association 2000). Given that the researchers are likely to use more than one information resource at any given time, and perhaps a laptop or Personal Computer (PC), the space per individual should be slightly higher than the traditional provision.

3. Staff workspace should also be kept low given that most of the work may be done online. Therefore, they may not need much space to store information resources being processed. Furthermore, with research libraries adopting structures where the librarians easily mix with the users, these staff workstations should not be stacked away in a corner but blended with the reading areas.

4. Research libraries should also have special spaces where researchers can eat, drink and talk. Depending on the size of the library and number of users, two or three of these may be sufficient. There should also be special rooms to use multimedia such as DVDs, video cassettes or play games.

5. The library should also be organized functionally such that reference materials are near the reference desk; and catalogue systems next to the circulation desk which should be located near the entrance or exit.

6. The library facility should also provide for persons with disability. This could be done by providing climbing lanes for wheel-chairs and other walking aids as well as availing supporting aid for accessing high shelves or even seats near shelves for persons who, due to disability, are not able to stand for long when browsing the shelves.

7. The library should always have spare space to allow for a minimum of ten years' growth (Medical Library Association 2000).

Cannell (2007) explains that much as research libraries are becoming digital, researchers still need adequate physical library place. She explains that researchers can find such a physical space very useful in many ways because the space can serve as:

1. A place to find "books"[36] – ability to access information resources readily and easily whether onsite or offsite. There is need to ensure that there is enough space to support the access and usage of "books" in research libraries;

2. A place for special collections – it is generally an accepted fact that special collections play a significant part in research. The activities around special collections such as discovery and use of rare collections are the "unique selling point"[37] for research libraries;

3. A place to get help – though researchers are now able to get help from the librarians through other means offsite, the library still remains the iconic place to meet the librarians and seek any help required for research. Consequently, space in research libraries should be so designed to facilitate easy interaction between users and librarians to enable the former to receive help;

4. A place to work – many researchers may prefer to work from the library due to its congeniality for research. Therefore, research libraries should be designed to support researchers seeking a quiet space to work from. It is recommended that such spaces should be away from the front doors and the shelves. It would be good if such spaces could be lockable offices. However, where this is not possible such spaces should have good lighting, wider desks with lockable drawers, access to power points, and wireless or wired access to the Internet;

5. A place from where the digital library services are offered – for many researchers who do not come to the library, the digital space is all they use. What most people are not aware of is the fact that it requires a huge amount of work to deploy effective digital services. This work only occurs in an environment that allows the specialist staff to work together, to seek the advice of users, working in physical and virtual teams to negotiate, buy, catalogue and give easy access to resources;

6. A place to celebrate research – the library should be used to celebrate excellence in research by giving space to researchers to display their reports and other publications; and

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[36] Cannell uses the term in a generic way to refer to all information materials.
[37] This is a concept used in marketing to represent what makes a product stand out from the competition (Knox *et al.* 2000).

7. A place to meet – research libraries should provide a space which is trusted and non-departmental, where cross-disciplinary discussion takes place, where creativity flourishes, where new interdisciplinary research projects are hatched.

Steele and Walters (2007) explain that the following should govern the design and use of research library space: 1) support for the institution's mission and vision; 2) support for effective collection and service delivery to the library users; and 3) priority for the research related services and operations in the library.

2.1.6 Interoperability

Historically, research libraries used to operate in isolation. Users who needed to access services and resources in other research libraries visited the libraries in their individual capacities. Indeed, McLean and Lynch (2004) agree that library interoperability is not easy to achieve and identify its major impediments as 1) dynamic and complex library operation environments that are hard to map between libraries; 2) divergent views by the stakeholders about the problems and possible solutions; and 3) pressure to solve problems using short-term "quick fixes" rather than long-term solutions. This situation is now changing and research libraries currently maintain wide networks with other libraries and relevant professional bodies (Brown and Swan 2007). Consequently, they design systems and mechanisms which are transparent and that facilitate interoperability making it easy to share information resources seamlessly. This is manifested through the use of similar software and hardware, cataloguing schemes, and document formats. The platform of collaboration is already shifting online. For instance, most research libraries do not have physical card catalogues any more. The card cabinets and drawers have been replaced by computer terminals with Internet connections. This interoperability is also extended to library users who are able to connect to the library from their own homes using their own software and hardware making the services portable. This interoperability and the shift to digital information resources are redefining interlibrary cooperation, a phenomenon that some scholars now call collaboration. Some existing evidence also shows that interlibrary loan rates are reducing.[38] Its place is being taken up by networked and distributed systems that enable interoperability (Rice 1993; Young and Lund 2008).

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[38] This was also confirmed by Mrs. Grace Kamau, ILRI's InfoCentre head in Nairobi during an interview on 21st July 2009. She reported that the InfoCentre used to pick and drop interlibrary loan requests at least three times a week. She reports this has drastically reduced and she can't recall when she received such requests last. Similar sentiments were also given by Mrs. Jacinta Kimwaki of ICRAF during an informal discussion on 20th July 2009.

2.1.7 Library access

For many years, researchers had to physically walk into the libraries to access services. Essentially, all the library services were offered at the library. Bryant (2003) explains that in a sense, the library's doors acted as a gateway to the library's collection. Often, the researcher had to seek admission into the library from a guard at the entrance. This is changing. For instance, many libraries are now accessible online. If any researcher needs any information, the same can be obtained easily from the library online and offsite (Pietrobon 2009). In fact, Brown and Swan (2007) report that the majority of researchers in the United Kingdom have sharply reduced their visits to the libraries in the recent past. Pietrobon (2009) also asserts that researchers have generally reduced their frequency of library visits. Instead, the researchers are now choosing to access digital information from their desktops, primarily from their offices but also from their homes. Brown and Swan (2007) also report that more natural science researchers prefer digital content than their humanities and social studies counterparts. Of course, user identification is still necessary for admission but the process is now much simpler through the use of smart cards which are authenticated by distributed information systems. This gateway is largely virtual in nature; and allows information into and out of the library. Needless to say, the researcher does not have to come to the library. Authentic users can log into the library system and serve themselves from their houses or offices; as long as they have an Internet connection. Mrs. Grace Kamau of ILRI's InfoCentre corroborates this view and reports[39] that users of her library rarely come to the library as they are able to access the services through the library portal running on the institute's Intranet.

Researchers normally work irregular hours, therefore, to accommodate them the research library should be open for longer hours. The Medical Library Association (2000) proposes at least 40 hours a week during which primary services such as circulation of materials, reference assistance, online searching, photocopying, reserve materials access and interlibrary loan materials requests provision can be offered. These may vary depending on the nature of researches undertaken by the parent institutions. Where possible, however, 24 hour service should be offered through ICTs. Brown and Swan (2007) assert that convenient opening hours are very important usability factors that determine the success of research libraries.

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[39] Information obtained from an interview with Grace Kamau on 21st July 2009.

2.1.8 Users

Research libraries basically serve the members of their parent institutions. This is justified by the fact that the libraries exist to support the core business of the institutions. There are instances, however, where the institutions are obliged to offer limited services such as on-site reference to members of the public as well. Others offer fee-based research services to non-affiliated researchers working in fields related to those of the parent organization's specialty (St. Clair, Harriston and Pellizzi 2003). Railiene (2005) reports that recent studies indicate that researchers are interested in the convenience and reliability of library services. The research librarians must aspire to deliver these attributes. She highlights the fact that researchers normally have very tight schedules and adds that competition in research is also very stiff and that the first announcement of results may render several years of similar work useless. She concludes that researchers must receive the information they need precisely and in time. St. Clair, Harriston and Pellizzi (2003:11) also add that most research libraries also offer limited services to non-research members of staff – such as administrators "down to the security guards and facilities workers" in a bid to empower them to support the organization better. This is an effort to harness all the resources in the organization towards achieving the core research objectives.

2.1.9 Budget

It is not easy to prescribe budget levels for research libraries. This is because they operate in diverse contexts governed by the mission and activities of the parent institutions and user needs. Brown and Swan (2007) while citing the Parry Report[40] suggest that the budget of a research library should be at least 6% of the institution's budget. In spite of this proposal, they accept the reality that since this proposal was made in 1967 the levels of research library budgets have been falling over the years. Ideally, the budget of a research library would normally cover three major items: 1) Library facilities; 2) Library materials; and 3) staffing and should be adequate to cater for the salaries and benefits of staff members; materials including the purchase of books, journal subscriptions, multimedia and electronic resources; binding; interlibrary loan fees; online resources licensing fees; network/consortia membership fees; ICT facilities such as bandwidth, hardware, software, among

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[40] This report on libraries was compiled under the auspices of the University Grants Committee in the United Kingdom in 1967 by a special committee chaired by Dr. Thomas Parry and has been referred to as the Parry Report ever since (Stoker 1994).

others; photocopying; stationery; telephone costs; correspondence costs such as postage, courier charges, telephone air time costs; maintenance and other housekeeping costs (Arms 2000).

Though research libraries also face budgetary constraints, they have better funding than their public or academic counterparts. Bremer (2004: Funding Sources) avers that library funding has been deteriorating. She explains:

> It has become increasingly necessary for libraries to seek alternative sources of revenue to support activities that were once thought to be the responsibility of tax dollars. Causes of this trend include the rapid growth of information, increased costs for services and materials, and demands for additional services. Many librarians today feel pressed to spend more time and energy making contacts and writing grant proposals in order to raise needed funds.

One of the issues that aggravate the funding situation is the need to invest more in library technology which many users now demand. For instance, Mrs. Grace Kamau of ILRI explained that her library users are demanding Web 2.0 tools. Though the demand is understandable and largely welcome, it is also a new budget item which the library will find difficult to absorb. Bremer (2004) clarifies that although funding "woes" are not unique to demands for technology, libraries of all types share the need to finance the escalating costs of technology, particularly those associated with the Internet. Evidently, if research libraries are to meet the increasing demands of a technologically aware clientele while maintaining quality collections, they must actively seek alternative funding for high-tech services that are now considered commonplace by the populations they serve (Kemmis 1998). Venkatraman (2009) points out that fundraising for libraries will not be easy especially in the wake of the economic recession which has caused losses for endowment funds in the stock markets.

2.1.10 Position in organizational structure

The head of a research library is a senior manager reporting to a director in the organization. In most research contexts, the head librarian reports to the director in charge of research, training or communication. This is because a research library also plays communication and capacity development roles. The role of the head librarian is both professional and administrative. The professional duties include oversight of technical operations such as cataloguing of materials; weeding the collection; and providing reference assistance using print and electronic media. The administrative responsibilities include planning, organizing and evaluating the work done in the library; setting goals for future needs; and communicating the goals to the organization's management. Further, the librarian is responsible for developing and administering the library's budget; selecting, training and supervising the library staff; encouraging communication between

staff members and also between staff and management; supporting the development and maintenance of good relations between the library staff and the users; and marketing of library services (Medical Library Association 2000). As discussed earlier, Rader (1995) asserts that the librarian should have "researcher" status to be able to influence policy in the institution that would enable the library to offer its services effectively.

2.1.11 Technology

The ICT revolution is impacting on library service scope, depth and delivery significantly. The impact of ICT tools on research libraries is basically three-pronged: 1) modernization of library services and products; 2) innovation through experimentation by exploiting the capabilities of the new technologies; and 3) transformation by fundamentally changing the nature and delivery of library services (Lynch 2000). Researchers are generally aware of and use technological tools in meeting their information needs (Kiplang'at and Ocholla 2005). There is a change in the perception of users regarding the place of technology in the library with more users now supporting the use of these technologies in delivering library services. This explains the remarkable increase in the number of electronic information products such as compact disks, software, indexes, full-text databases, electronic journals and online newsletters usable on the Internet (Medical Library Association 2000). Though Lynch (2000) suggests that libraries were "forced" to react to changes facilitated by ICT, many research libraries have made remarkable strides towards domestication of the technology to conceptualize and deliver library services.

Research libraries should harness the power of the latest ICT tools to provide superior library services to the researchers who are already using these tools individually or through social networks to seek information. It is important, therefore, that any research library should provide 1) electronic workstations for all the library staff; 2) access to the Internet; and 3) in-house databases appropriate for the areas of research (Medical Library Association 2000). The library should also be integrated with the institutional websites, Extranets and Intranets. Where possible, depending on the preferences of the users, the libraries should also develop Web 2.0 interactive tools such as blogs, wikis, and folksonomies[41], among others, to support the services rendered to the users.

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[41] Folksonomy is the practice and method of collaboratively creating and managing tags to annotate and categorize content (Wikipedia Contributors 2009f). It is also known as collaborative tagging, social classification or social indexing and enables end users to do subject indexing. The assigned tags are shown immediately on the Web (Voss 2007) as indices. Folksonomy became popular on the Web in 2004 (Wikipedia Contributors 2009f).

2.2 Comparing research libraries with the other types of libraries

Table 2.1 summarizes the similarities and differences between research libraries and the other library typologies:

Table 2.1: Comparison of research libraries with the other library typologies
Source: Researcher

Characteristic	Library typology			
	Research	*Academic*	*Public*	*School*
Collection	In-depth coverage of few disciplines	In-depth coverage of diverse disciplines	General purpose coverage of almost every discipline	Coverage of materials relating to learning
Service Portfolio	Tailor-made services	Low level of tailoring of services	"One size fits all" approach	Basic reading and lending services
Physical Space	Small	Large	Medium	Small
ICT use	Extensive and intensive	Extensive and intensive	Minimal in most countries	Minimal in most countries
Budget	High compared to the number of users	Low compared to the number of users and areas of interest	Low	Low
Users	Specialists	Specialists (lecturers and researchers) and learners	General public	School children
Access	Restricted strictly to researchers and research work	Serve the university communities and may be open to the public in some instances	Open to the public	Primarily for the school children but may be open to the community around the school and educators for curriculum development.

Evidently, from Table 2.1 above, research libraries are generally small, hold collections covering specific subject areas in-depth, tailor services to support the interests of specialists and have higher budgets than the other library typologies. Research libraries are also reputed to make extensive use of ICTs.

2.3 Research libraries in Kenya

There is no documented account of the history of research libraries in Kenya. However, Rosenberg (1993) indicates that Kenya's Departments of Forestry and Agriculture had launched libraries by 1905 and 1907 respectively. These could be the first research libraries in Kenya. Other pioneer libraries in Kenya include the MacMillan Memorial Library established in 1931 as a public library for

the Europeans only; the Pumwani Memorial Hall Library established for Africans in 1938; and Desai Memorial Library which was established in 1942 for the Asian community. Rosenberg (1993) also indicates that the Kenya National Library Service (KNLS) was established in 1965 and the Kenya Library Association (KLA) launched in 1973. Anecdotal evidence, however, place the roots of modern research libraries in Kenya in the period between 1965 and 1970 when the government of independence launched national research institutions to help fight the three stated enemies: disease, poverty and ignorance. Non-governmental organizations such as the International Centre for Insect Physiology and Ecology (ICIPE) also developed in the early 1970s and with them came specialized libraries to support their research work.

No official list exists of research libraries or any other typology of libraries in Kenya. The researcher was informed by veteran librarians like Mrs. Jacinta Were and Mrs. Grace Kamau[42] that there used to be a directory of libraries in Kenya published by Kenyatta University[43] in the 1980s which has since gone out of print. Unfortunately, the researcher was unable to get even an old copy of the directory; even the Kenya National Archives and the KNLS did not have any copy or records of the title. However, the researcher, through the input of experienced librarians in the country and the Kenya Library Association, developed the following list of research libraries in Kenya:

1. African Medical and Research Foundation (AMREF)
2. African Centre for Technology Studies (ACTS)
3. African Economic Research Consortium (AERC)
4. African Population and Health Research Centre (APHRC)
5. British Institute in Eastern Africa (BIEA)
6. Institute Francais De Rech (French Institute of Research)
7. International Centre for Insect Physiology and Ecology (ICIPE)
8. International Development Research Centre (IDRC)
9. International Livestock Research Institute (ILRI)
10. Institute for Meteorological Training and Research (IMTR)
11. Institute of Policy Analysis and Research (IPAR)
12. Kenya Agricultural Research Institute (KARI)

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[42] Mrs. Were is an outgoing University Librarian of the University of Nairobi while Mrs. Kamau is the Head of ILRI's InfoCentre in Nairobi.
[43] Kenyatta University is a public university in Kenya. It is one of the two pioneer universities to offer training at degree and diploma levels on librarianship. The other is Moi University.

13. Kenya Forestry Research Institute (KEFRI)

14. Kenya Industrial Research Development Institute (KIRDI)

15. Kenya Institute for Public Policy Research and Analysis (KIPPRA)

16. Kenya Marine and Fisheries Research Institute (KMFRI)

17. Kenya Medical Research Institute (KEMRI)

18. Kenya School of Monitory Studies (KSMS)

19. National Economic and Social Council (NESC)

20. World Agroforestry Centre which is commonly known as ICRAF which is the acronym of its former name – International Centre for Research in Agroforestry.

The research sector in Kenya is still in its infancy compared to other countries. The research institutions and libraries in the country are mainly funded by donors in Europe, North America and some Asian countries, especially Japan. For instance, most KEMRI programmes are funded by the Wellcome Trust (United Kingdom), Centre for Disease Control and Prevention (United States of America) and the Walter Reed Army Institute of Research (United States of America) (Ochola and Gitau 2009). The apparent sole reliance on donor-funding for national research is not suitable as it gives the donors undue influence over the research agenda in the country. Further, it is not sustainable when or if donors withdraw their support. Another serious challenge of the sector is its inability to retain experts most of whom have emigrated from the country to pursue opportunities in other countries (Ochola and Gitau 2009). Another major challenge of research in Kenya is lack of research facilities such as laboratories and proper mentorship which is attributable to the low numbers of senior researchers due to the aforesaid brain drain. Most researchers seek to become independent soon after their doctoral or post-doctoral training (Wambalaba 2007; Ochola and Gitau 2009). Consequently, the role of research in national development has been limited. To mainstream research in Kenya, researchers need to identify research questions based on the needs of the Kenyan society so as to feed into national policy and contribute to national research systems (Ochola and Gitau 2009). There is also need for the government to increase its support for the research institutions and projects by providing more funding and environments suitable for research. The government also needs to appreciate research by relying on research evidence for policy development and implementation (Webster 2002; Oyugi and Kibua 2008).

2.4 The Kenya Library and Information Services Consortium (KLISC)[44]

Discussions with leading librarians[45] and members of the KLA[46] reveal that research libraries in Kenya face myriad challenges. These include inadequate budgets, high institutional demands, high costs of bandwidth, inadequate staffing, lack of institutional support, high obsolescence of information materials, inadequate resource sharing mechanisms, and lack of an effective professional body. In an effort to address some of these challenges, the librarianship community in Kenya established the Kenya Library and Information Services Consortium (KLISC).

This consortium was established as part of the Programme for Enhancement of Research Information (PERI) initiated by the International Network for the Availability of Scientific Publications (INASP)[47] in 2000. It was a response to the inability of most research and academic libraries to sustain subscriptions to journals. Most of the libraries had been hit by huge budget reductions thereby crippling their capacity to maintain the subscriptions. Indeed, many were several years (six and more) behind.

PERI was formed to enable libraries utilizing ICTs to access journals affordably. Specifically, there was a focus on electronic journals as being affordable and more accessible alternatives to print journals. For instance, in 1999 the University of Nairobi Library used to spend about Ksh 12 million (USD 185,000 by 1999 exchange rates) annually to subscribe to 3,600 titles. Through the PERI initiative, the library now spends just Ksh 1.7 million (USD 22,000 by 2009 exchange rates) annually for over 20,000 journal titles. This is a huge saving and has enabled all library users to access the latest issues of journals.

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[44] Most of the information in this section is based on an interview by the researcher with Mrs. Jacinta Were, retiring University of Nairobi Librarian and Coordinator of KLISC. The interview was conducted on 3rd April 2009 at the University of Nairobi's Jomo Kenyatta Memorial Library.

[45] Discussions were held with the librarians at the case libraries on diverse dates. The librarians included Grace Kamau of ILRI, Jane Ireri of AMREF, Jacinta Kimwaki of ICRAF, Sarah Mang'oli of KEMRI and Humphrey Keah of ICRAF. Mrs. Jacinta Were of the University of Nairobi also provided tips.

[46] Discussions were conducted through postings in the KLA mailing list.

[47] INASP was established by the International Council for Science (ICSU) in 1992 and registered as a charity organization in the United Kingdom in 2004. INASP works with its partners to enable them develop, organize and disseminate scientific information for research through the use of ICTs. Based in Oxford, INASP is funded by its partner countries, governmental and non-governmental developmental agencies, and philanthropic foundations (Godlee *et al.* 2004).

The programme was initially donor funded up to 2002. The libraries came together under KLISC in 2003 to continue the programme. The members of the consortium pooled resources together and purchased country-level subscriptions through INASP which negotiated huge discounts with the publishers. Through this arrangement, the libraries are still able to subscribe to over 20,000 journal titles which their users can access electronically.

KLISC currently has forty nine[48] members falling in three broad categories: public universities, private universities, and non-university institutions. Research libraries fall under the non-university institutions category. All the case libraries in this study are members of the consortium. The University of Nairobi currently hosts the consortium. Members contribute an agreed fee based on category. Public universities contribute Ksh 1.7 million each; private universities contribute Ksh 360,000 each; while non-university institutions contribute Ksh 200,000 each annually.

KLISC has generated many benefits for the member libraries and their users: 1) It has enabled them to avail full-text access to current journals to their users. This was unimaginable just prior to the launch of the consortium. Only a few libraries could afford to maintain current print journals but even these had to wait for delivery of the actual publications. Today, users can download the journals as soon as they are published (posted); 2) Due to the digital nature of the journals, the users are able to access the same journal simultaneously. Consequently, there are no delays and other hitches associated with the borrowing of print journals such as tear and wear or loss of the publications; 3) The consortium also collaborates with the British Library Document Delivery Services to purchase journal articles which are not available through KLISC. Such journals are delivered through the consortium in a maximum of five days which is relatively fast. Because of the high costs involved, these deliveries are restricted only to important documents (agreed on by the librarians and the users) which are not available locally; 4) The consortium has enhanced the use of ICTs for library services delivery in Kenya. Initially, there were fears that most of the libraries would not benefit due to poor ICT infrastructure and skill challenges. There were even suggestions that the journals should be delivered on CD-ROMs. However, most members opted for the direct Internet access as opposed to CD-ROMs. This has stimulated bandwidth expansion and other investments in ICT systems amongst the member institutions; 5) the KLISC has been used as a platform to build the capacity of librarians to offer services using ICTs and also enhance the skills of researchers to

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[48] The full KLISC membership list is enclosed as Appendix 2.

use ICTs to search and access research materials. This has been done through workshops for librarians and researchers; and 6) KLISC also provides a platform, through its meetings, for librarians to network, exchange ideas or even lobby policy makers on pertinent issues.

The consortium faces numerous challenges. The first hurdle was convincing librarians and libraries to come on board. Basically, they were resistant to change. There were also concerns about lack of adequate ICT infrastructure and know-how in the country. Some members were also initially suspicious of the others and lacked the trust to join wholeheartedly. The second challenge was devising a formula for sharing the subscription fees. The other challenge was from the researchers who initially lacked faith in electronic journals. Most of the older researchers preferred print journals which they could borrow and read at home. But they are slowly being won over. There is also a challenge with the coordination of the consortium given that it is yet to establish its own secretariat. INASP is also planning to hand over the full subscriptions' management to the consortium in Kenya. There are plans, therefore, to incorporate KLISC as an independent organization under the auspices of the Ministry of Science and Technology.

2.5 Case research libraries

This case study was conducted on the five case libraries discussed below. The selection criteria of the cases are provided in Chapter 5 (item 5.3).

2.5.1 African Medical and Research Foundation Library

AMREF's library is located at its International Training Centre, on Langata road in Nairobi, which is also the foundation's headquarters. It was established to:

1. Provide a platform that enables AMREF staff to share experiences and learn from one another by organizing and disseminating lessons learnt from all programme activities; and
2. Strengthen health systems in Africa by providing health workers with relevant and up-to-date information and knowledge.

The library holds a diverse collection of information resources including monographs, AMREF publications, articles published by AMREF staff, grey literature,[49] a "granary" containing valuable

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[49] These are unpublished materials including dissertations of various health professionals on diverse health issues.

archival information and images from Africa. It also has access to over 6,000 international electronic journals, over 7,500 electronic books and unlimited access to health and educational materials. The library also holds a large collection of health, development and educational videos. To keep the users informed of the new developments in the library, it publishes an e-bulletin on a monthly basis which is circulated to all users. The AMREF library also hosts an Antiretroviral Therapy (ART) knowledge hub. This hub provides an easy access to a wide variety of HIV/AIDS treatment materials in a single location. As part of the hub, a monthly bulletin and ART case presentations are circulated online through electronic discussion forums on which professionals are able to share information regardless of their geographical location.

This library basically plays a coordinating role in managing AMREF's knowledge by collating, organizing and disseminating knowledge generated by all programmes enabling seamless sharing of experiences across AMREF and globally. Apart from the staff members as well as diploma and graduate students[50] at the foundation, the library's services are also open to all members of the public under certain membership terms. The library opens at 9am to 8pm from Monday to Friday; and 9am to 4pm on Saturdays. It remains closed on Sundays and public holidays.

2.5.2 International Centre for Research in Agroforestry[51] Library
ICRAF's library was established in 1997 with the organization. It is located at the institution's headquarters near the United Nations complex in Gigiri, Nairobi. The library basically exists to enable the scientists at the centre and their partners to get access to relevant information needed for their work. The library holds a specialized collection of books, journal literature with considerable back runs, reprints, videos and images on Agroforestry.

The library collaborates with similar libraries both in the region and globally. Among these partners are other CGIAR[52] centres, several national agricultural research institutes, and various United Nations (UN) organizations. The CGIAR Libraries and Information Services Consortium

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[50] AMREF offers a diploma in community health as well as Master of Public Health (MPH) programme with Moi University.
[51] ICRAF is also known as World Agroforestry Centre.
[52] Consultative Group on International Agricultural Research (CGIAR) is a network of independent institutions working in agricultural research. ILRI and ICRAF are members of CGIAR.

(CGLISC) has developed the CGVLibrary,[53] a gateway to global agricultural knowledge from which leading databases and all CGIAR centres' online libraries can be accessed. The services offered by the library include: circulation of library materials; document delivery and interlibrary loan service; user education; literature searches; computerized database searches; question and answer service; current awareness; reprographic services; and assisting users to gain access to and retrieve information.

The library stocks over 25,192 books; 20,171 journal articles with back runs; basic reference collection; good collection of maps; conference papers; technical manuals; ICRAF publication series; and a rich collection of DVDs, VCDs, audio cassettes and video tapes. It also holds several unpublished papers on Agroforestry from many sources. It is open to all for reading. However, borrowing is restricted only to ICRAF's staff members, partners, consultants and members of staff of partner organizations. Services to eligible members outside Nairobi are offered through email, courier or postal services. The library also serves other Agroforestry centres in South East Asia, Southern Africa, India and East Africa.

2.5.3 International Livestock Research Institute's InfoCentre

ILRI's InfoCentre was established in 2003-2004. Its mission is to make available the wealth of information accumulated over the years by ILRI through new information and communication technologies; and create a hub for information exchange on livestock research and development in tropical developing countries and international agricultural research centres and partners. The InfoCentre maintains two branches; one in Nairobi, Kenya and the other in Addis Ababa, Ethiopia. This study was conducted in the Nairobi branch.

The core objectives of the InfoCentre are to:

1. Meet the information needs of ILRI scientists to enable them to make time-saving and cost-effective use of internal and external information resources;

2. Repackage ILRI's research results and findings (in collaboration with other pertinent ILRI units) for dissemination to external clients, partners and stakeholders;

3. Deliver the best possible information services to extramural users through web-based technologies;

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[53] Accessible online at http://vlibrary.cgiar.org/

4. Contribute to the development of CGIAR-wide information/knowledge management activities;

5. Develop better integration of information activities within research projects;

6. Provide information support to global research on livestock;

7. Collaborate with relevant national, regional and international organizations to facilitate global dissemination of information and share resources and knowledge;

8. Provide training in information management and the use of information and communication technology to enhance the information handling capability of information workers of national agricultural research systems; and

9. Establish policies and procedures to maintain, use, and distribute digitized or printed information sources.

ILRI's InfoCentre offers lending services; reference services using internal and external electronic databases; publication distribution; multimedia facilities; conference facilities; organizing ILRI-focused exhibitions of public interest; reading room with Internet access points for laptops; and Internet access cafés. It has diverse collections of books, journals and CD-ROMs in online and print formats, microfiches, videotapes, theses, conference proceedings, maps, photographs, newspapers and other forms of literature. The Nairobi branch focuses more on biological sciences while the Addis Ababa branch offers resources on a wide spectrum of disciplines including agricultural economics and veterinary science. The Addis Ababa branch also stocks a collection of more than 30,000 unpublished documents from research centres in over 25 countries in sub-Saharan Africa.

The membership of the InfoCentre is diverse. Internal members consist of staff members, trainees, consultants, visiting scientists, post-doctoral fellows, long-term trainees and staff members of other CGIAR centres posted at ILRI. There are also external members comprising agricultural researchers, policy makers, teaching staff of agricultural colleges and universities, as well as post-graduate and doctoral students.

2.5.4 Kenya Agricultural Research Institute Library

KARI Library caters for agricultural researchers both from KARI and other institutions by identifying, acquiring, processing and making available appropriate information sources. It has 23 branch libraries spread in the various research centres countrywide. It has a large collection of

monographs and journals covering research on biotechnology, food crops, horticultural and industrial crops, land and water management, livestock and range research, veterinary vaccines, seeds and biometrics.

The library is primarily intended for KARI staff, visiting scientists and participants in various KARI sponsored or partnership training programmes. However, scientists from the other research institutions in Kenya can also use the library for reference and reading purposes. They may also borrow items from the library through interlibrary loan mechanisms.

The library subscribes to both print and electronic journals as well as external online databases. Books and periodicals are circulated to KARI scientists and other institutions that collaborate with KARI. Users have electronic access to external sources of information through the internal and external databases on CD-ROM or through the Internet. The library also provides a "question and answer" service through the support of the Technical Centre for Agriculture and Rural Cooperation (CTA).

2.5.5 Kenya Medical Research Institute Library

The KEMRI library was established in 1979 when the institute was organized. Its vision is to be the first point of choice for library information services relating to biomedical research. The mission of the library is to provide comprehensive library and information services related to all the functions of the institute including the scientific, academic and administrative needs. It aims to accomplish its mission and vision by:

1. Selecting, acquiring and organizing a wide range of quality electronic and print information resources in line with the institute's mandates, programmes and services;
2. Contributing to the development of quality health care through the provision of access to quality information services to researchers, administrators and the academics;
3. Making use of ICTs in the management of library and information services for enhancement of efficiency;
4. Providing information literacy programmes to enable users to exploit the available information resources to the maximum;
5. Developing new information services as and when necessary by keeping updated on the changing environment of information services provision; and
6. Developing a library services charter in line with the institute's service charter.

KEMRI library serves the research staff, post-graduate students of the Graduate Programme, students and other individuals from relevant institutions seeking information on health research. The resources in the library include online medical databases and electronic scientific journals; books and printed reports; CD-ROMs; theses and dissertations from the institute's staff members; and scientific reprints from members of staff. The library also holds reprints from KEMRI's research activities in HIV/AIDS, malaria, leishmaniais, lymphatic filariasis, public health, reproductive health, schistosomiasis, traditional medicines and drugs, tuberculosis and viral hepatitis, among others.

The library offers reference assistance, lending services, literature searches, Internet/email services, interlibrary loan as well as photocopying/printing services. The Library collaborates with local and international health libraries in matters relating to health information resources and services.

2.6 Summary

The concept of the research library is fairly new and grew out of the perceived failure of traditional libraries to meet the specialized needs of researchers. Consequently, research libraries are viewed as the trend-setters in the provision of library services. Research libraries exhibit unique characteristics manifested through in-depth targeted collections, personalized service, liberal library space, and collaborative systems. Further, in an effort to exploit emerging ICTs, most research library services are now offered on technological platforms. In fact, most of the libraries have fewer physical than electronic collections. Whilst this is commendable because it increases the reach and usability of the resources, it is also an impediment to the provision of quality services since fascination with technology often distracts attention from quality of content of the resources provided.

The research library has also been keen in redefining librarianship. For instance, the role of the research librarian was initially peripheral; restricted to helping the researchers to locate and access information resources. This notion is changing fast as research librarians are now considered core members of research teams. Another emerging role of the research library that many of its users and sponsors have not considered seriously is publishing. Growth in research has led to an explosion of publishable materials that traditional publishers cannot cope with. On the other hand research output publishing is a prestigious task that cannot be easily removed from the current professional

publishers. Nonetheless, research libraries need to devise publishing strategies that would maximize the benefits while reducing the disadvantages.

Research libraries are still developing and are likely to acquire and discard some characteristics and modes of operation. What may remain constant, however, is the recognition of their core purpose of supporting research activities through the provision of relevant information necessary for research in a timely manner. Recognizing the competition that exists in the research sector where the first publication of research findings may render ongoing similar studies redundant, research libraries must work efficiently and effectively in managing information collaboratively with the researchers and sponsoring institutions.

The research libraries in Kenya are also listed in this chapter. The five case libraries have also been described.

CHAPTER THREE – LITERATURE REVIEW

3.0 Introduction

A literature review is a comprehensive analysis of existing research and other publications relating to an area of knowledge or research problem (Saunders 1999; Taylor 2008). The publications that could be considered in a literature review include books, scholarly journal articles, theses and dissertations, government documents, references quoted in other works, abstracts, grey literature, periodicals, electronic publications, conference papers and reports, among others. The literature review process, therefore, involves the systematic and extensive identification, location and analysis of relevant documents (Mugenda and Mugenda 1999; Kaniki 2006). Kaniki (2006) adds that it is a vital process in the research project that includes identifying potentially relevant sources, an initial assessment of these sources, thorough analysis of selected sources, and the construction of an account that integrates and explains relevant sources.

A literature review is important for academic research and serves many purposes such as: 1) identifying knowledge gaps and concretizing the research problem; 2) identifying a theoretical framework; 3) identifying issues and variables related to the research problem; 4) identifying conceptual and operational definitions; and 5) identifying methodologies suitable for the study (Mugenda and Mugenda 1999; Kaniki 2006; Levy and Ellis 2006). Mugenda and Mugenda (1999) assert that a good literature review should help the researcher to avoid unnecessary duplication, form the framework within which the research findings are interpreted and demonstrate his/her familiarity with the topic of study.

It is also worth noting that a researcher should not conduct a literature review hurriedly because this may lead to some of the issues not being identified properly and analyzed effectively. Though secondary documents provide crucial information on how the subject of study has developed over time, one should also not rely too much on them because they often contain "tired" information that has been studied by many other researchers. However, a balanced mix of the primary and secondary data gives a research project wholesome input that would influence the quality of the findings (Mugenda and Mugenda 1999; Levy and Ellis 2006). Thus a literature review is an evaluative account of what has been published on a specific topic the key purpose of which is to summarize, synthesize, and analyze the arguments of others to reveal similarities and differences between this

published works and the new research. For a researcher to achieve this, s/he must not only read extensively and voraciously but also selectively (Roberts 2004). It is more than just a listing of what others have published on the topic but a recognition of what has been done with the view of filling the gaps that may exist in the previous works. It also enables the researcher to fit the study into the existing body of knowledge on the topic and/or expand it accordingly. Ideally, the review should focus on works by recognized scholars in the area of study. However, some of the research projects may not have been covered by many recognized scholars making it inappropriate to restrict the scope of the literature. There are also instances when the research topic is interdisciplinary requiring a wider view than is presented by specialists in narrow areas of expertise.

The purpose of this literature review was to analyze published scholarly work on models of library service delivery. This analysis was aimed at setting the basis upon which Library 2.0 as a model of library service would be considered in Chapter 4. It was the desire of the researcher to analyze a mix of primary and secondary scholarly publications. However, he found very few scholarly publications on this topic. Consequently, the bulk of the reviewed literature was derived from online publications such as web pages, conference reports, concept papers, and blog entries. He also reviewed some journal articles and a few monographs. His analysis centered on what a library service model is, why library services should be delivered using models as well as a presentation of in-depth discussions of some of the common models currently used by libraries. The foundations, critiques, advantages and disadvantages of each of the selected models were considered and are presented hereunder.

3.1 Library service model

A model is a hypothetical description of a complex entity or process. It can also be perceived as the representation of a type of product or service which is identifiable through a unique characterization (Kuhne, 2005). Models are normally recognizable and are easy to replicate. Thus, models are generally exemplars that set standards which are emulated and reproduced by similar entities. They are also often an abstraction from reality, purposely simplified to allow concentration on key factors and aid investigation (Hestenes, 1996). The term "model" is also used to connote an object or service that has been developed according to a plan that has been tested and adopted by others. It is in this sense that we seek to explore library service models.

Library service models can therefore be perceived as types of library services which are differentiated through unique characterizations such as type of collection held, target users, type of library (academic, research, school, public and so on) in which it is offered, special features of the services offered, service philosophy, and general library organization. Library contexts are unique and it is not surprising to get libraries that apply hybrid models to be able to deliver their specialized mandates. Practically, it is not easy to have a clear-cut model which is exclusive of all the others. However, most libraries adopt more features from a single library model by which they can then be described. Paradoxically, most librarians apply these models without knowing it. Preliminary findings of the study also indicate that this phenomenon, especially in Kenya, can be attributed largely to imitation of successful library service models.

There is very little published scholarly work on library service models. The information that exists is scanty and scattered over many resources. However, the researcher managed to piece together a number of models from diverse literature. The literature reviewed seems to suggest that there is a general perception that traditional library models are no longer suitable for the modern society and that there is perceived pressure on the libraries to modernize. The literature often refers to "the library of the future" which is more sought after now seemingly than in the past. However, no clear model that accurately defines the shape of that future library, its services and systems emerged from the review (Murray 2006).

3.1.1 Traditional model

This is the oldest and most common model of library services. It is anchored in the effective management of the library catalogue and physical collection. Indeed, Sweeney (1994) asserts that the traditional library is defined by physical place and collection. The heavy reliance of this service model on physical collection has earned it the title: "Acquire - Catalogue – Circulate" model (Xiaolin 2004; Remelts 2005; Murray 2006). Other scholars also refer to it as the "Acquire – Catalogue – Store – Lend" model (Lim 2002). Some of the literature reviewed had negative comments on this model of library service and in some cases described it as archaic, primitive and outdated and predicted its demise in due course (Remelts 2005). This view can be attributed to the hype for change; not just in library services but also in the society at large. But there were others who asserted that the traditional library model is still relevant and will never be replaced by any other model; not even the digital library. While admitting that there is a great "temptation" to move to the

newer models – mainly digital libraries – those who support the traditional library model explain that the other models of library services will only co-exist with the traditional one and complement each other but not replace it (Remelts 2005). Persson (2003) also adds that libraries are in a constant state of motion travelling with the societal contexts to remain relevant and normally blend the new and traditional to offer wholesome services. It is also evident from the literature that many people, and institutions, advocate caution while at the same time agitating for modernization. Consequently, what is described by some as traditional actually turns out to represent continuity, reliability and quality assurance to others. The latter school of thought views the traditional library model as the bridge between the past, current and future models and cannot be discarded easily without jeopardizing the quality of library services.

The review also revealed that the traditional model emphasizes mediation of the services by the librarians. Thus, the librarians connect the users and the library collection. The information the users need is contained within the library building, and therefore the help that users also need in order to exploit these resources fully has to be delivered right beside the print collection (Joint 2008) by the librarians. It follows, therefore, that the resources have to be accurately described to facilitate efficient location and delivery to the users (Borbinha 2002). Of course the library services have evolved from the closed-stack systems where the users had to rely on the librarians to fetch the books on their behalf, to open access systems. However, while the users are now free to browse the shelves and choose the resources they are interested in, in the traditional model they still have to rely on the librarians to check out the books. Some scholars have called this the supermarket model which though better than the retail model, is still limiting to users on various fronts (Lim 2002). It is noteworthy that in these models – supermarket or retail – the librarian and the users are still separated by a service desk keeping the librarian in control.

The traditional model of service is also unidirectional, to a large extent, and rarely involves the users in making the decisions on what and how they should be served (Lim 2002; Pienaar and Smith 2008). It is hierarchical, relatively slow – exhibits hesitancy by preferring to "play it safe" – but stable (Sweeney 1994; Persson 2003). Though there are attempts to embrace participatory processes in this model of service, the libraries using it still generally apply the "one size fits all" policy in which users' diverse interests and preferences are least considered (Borbinha 2002; Lim 2002). Further, there is a perception that some traditional librarians do not take user comments and suggestions kindly and

interpret them as a challenge to their (librarians') authority and expertise. Such librarians believe that they know everything there is to know about information services and resources; they do not need any assistance, let alone from users who are not trained in librarianship (Farkas 2004). So, the library users should go to them like a patient to a doctor and wait for the prescription which should be followed strictly. Many modern users resent this mentality and only go to the library when they really must.

It is also evident from the reviewed literature that the traditional model is largely site-based. It requires the users to visit the physical library to get the services. Further, the library opens for a fixed prescribed period of time and the services can only be accessed during those opening hours. It follows, therefore, that the traditional library only serves users who are able to visit the library premises during the opening hours. Persson (2003) further explains that apart from being localized, traditional libraries, like most organizations, tend to be rigid and often resist change. He also adds that they (traditional libraries) also accomplish tasks through routines strictly managed and enforced by the appropriate systems in the hierarchies. Farkas (2004) supports Persson (2003) that some librarians can be "traditionalists" who do not want to change the decades-old techniques and tools. Surprisingly, she says she met many of these "traditionalists" in Library School! It is also evident from some comments found during the review that many librarians do not understand the rationale behind the "push" on the libraries to offer services differently. For instance, some have wondered why a library should be fashioned like a "day care"[54] centre. Specifically, Houghton-Jan (2006) points out that most librarians particularly find working with youths more difficult. However, she urges tolerance and encourages librarians to be prepared in "teen programming", for noise, teen stuff (backpacks), group work, socializing, and group computer play.

Another key feature of the traditional model of service that is discernible from the literature is that it emphasizes the use of authoritative information sources. Consequently, libraries using this model have quality control mechanisms to ensure that only credible information sources are acquired and delivered at the libraries. This implies that the quality of library-based information resources is generally much higher than their digital and other contemporaries. Further, the librarian-mediated information services use tested techniques making them more rewarding and reliable than services

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[54] The concept is used here to denote pampering of the users who sometimes do not know what they are looking for and may seem disorganized.

from other non-mediated alternatives (Krupa 2006). There are also views that besides questionable quality, online/digital resources, for instance, are not eye-friendly. Many people find it easier to read physical printed books than their digital counterparts on the digital device screens. Krupa (2006) reports findings of an investigation into information medium format preferences and provides the verbatim response below:

> I prefer reading the traditional book, because it is more comfortable for me. I just cannot imagine reading the whole book on the computer screen. It would be awfully tiresome for me and give no pleasure (Krupa 2006: Research Results).

While supporting the view that library collections are more authoritative, Farkas (2004) suggests that librarians need to incorporate the "ease of use" one finds "with a Google or a Yahoo!"[55] in order to make searching at the library more seamless. Particularly, many users reportedly prefer searching for information using natural language. Of course, there are several disadvantages to this such as low relevance levels, but the librarians should adapt their systems to the "Google or Yahoo!" reality; giving hints on spellings, derivatives, abbreviations and other possibilities on every search conducted by the users.

The literature also reveals that the traditional library model services are offered in quiet and sombre environments. This view emanates from the notion that anyone using the library services needs to be "serious" and silence in libraries is considered an important attribute of seriousness. As a way of reminding users of this obligation, signs requesting users to maintain silence are posted conspicuously on most traditional library buildings. Consequently, library users are meant to use the resources silently on their own without engaging colleagues in the reading areas. Besides, there is little or no provision of group-work environments in the traditional libraries. The users are also not meant to carry any foodstuffs or drinks into the library, let alone eat in the library (Farkas 2004; Houghton-Jan 2006). Clearly, the traditional library premise, among other library metaphors, is treated as a sacred place (Kennedy 2008) where the golden rule of silence abounds. Whereas silence may be conducive to some users, many others may want some background noise to keep them productive. This is the rationale behind use of piped music in libraries (Rippel 2003). Actually, in the

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[55] These are search engines; used here to represent digital content which is searchable and readily available online.

real world, people work amidst many other activities and surroundings. People who are used to the "real" world work environments find the quiet library unsuitable for meaningful work.

Some scholars also suggest that the traditional library model utilizes the "Just-In-Case" collection development policy as opposed to "Just-In-Time" policy which is steadily being adopted by progressive libraries. They explain that in a "Just-In-Case" approach the library acquires information resources with the hope that some user may someday require the resources. In the latter concept, however, the libraries only acquire what is needed when it is needed. Actually, the libraries using the "Just-In-Time" approach focus more on access to resources rather than ownership (Hanson 2007). Such libraries have worked out mechanisms to facilitate faster access to resources "full-text" on demand through various technology facilitated systems such as electronic journal servers, current awareness services with document delivery, tailored full-text products, bibliographic databases offering full-text access, and pre-print servers, among others (Arant and Payne 2001; Nielsen and Eriksson 2002; Hanson 2007). However, Sweeney (1994) explains that the "Just-In-Case" collection approach also has certain benefits over "Just-In-Time". For instance, he points out that the former results in more "well-rounded" collections than the latter. Nevertheless, he is quick to add that most traditional libraries boast of the collections without realizing that a good collection alone does not constitute good library services. Hamburg *et al.* (1974) agree with this view and point out that the success of a library cannot be evaluated merely on the collection it has but critically by the level of exposure to the collection it gives to the users. They conclude that a good library maximizes the exposure of users to bibliographic material. Consequently, an effective library service requires systems that enable users to interact optimally with the good collection and is normally indicated by a satisfied user. If a user is unable to locate an information resource because it is being used or it is borrowed or it has been mis-shelved, s/he leaves the library dissatisfied even though the collection is good and had the potential of meeting his/her needs. Nitecki (1993) also underscores the fact that librarianship is more than just the collection or its arrangement. The concept of metalibrarianship, he explains, is that true librarianship is involved in understanding and facilitating the relationships between library users, the content of the collection and the systems that facilitate the sharing of the collection. He adds that librarianship is not just a record-service oriented approach (explicit service based on the collection) but also an information-process science (pivoted on the provision of information through dynamic processes and systems). Consequently, whereas some traditional libraries still measure their success by the adequacy of the physical collection and library place such

as size of collection, number of books borrowed, number of chairs and tables in the reading areas; progressive libraries measure success by evaluating user satisfaction.

From the literature reviewed, the researcher concludes that there is overwhelming evidence that many library professionals and users agree that the traditional library model should be reengineered. Some of the reasons put forth to support this view include: 1) User service demands are increasing far more rapidly than the resources to meet these needs in traditional ways; 2) The cost of building large collections of books and journals has escalated far faster than library resources; 3) New information technology provides opportunities for vastly improved services with far greater access than traditional model libraries; 4) External agencies, parent organizations, and governments have placed greater burdens upon libraries and the services which libraries must provide; and 5) Users have increased the scope and depth of demands on libraries (Sweeney 1994; Farkas 2004; Krupa 2006; Hanson 2007).

3.1.2 Community library model

Stilwell (1999: 17) explains that the idea of offering library services to "extremely deprived neighbourhoods" began in Britain as early as the 1890s. These unique library services offered in specific neighbourhoods became known generally as community libraries. Stilwell (2001) states that most community libraries as we know them today emerged from public libraries in the 1960s in an attempt to move away from the passive traditional public library model towards the active service-oriented and user-friendly library systems based on neighbourhoods (Mostert 2002; Stilwell 1989). Stilwell (1989) explains that community libraries emerged to offer services which would satisfy users with higher expectations more ably than public libraries which were perceived as dispassionate and cold. Some scholars, however, argue that most community libraries emerged to provide problem-related information which is unique to particular communities (Atuti 2001; Stilwell 1989, 2001). Generally, community libraries provide two broad categories of information: survival information and citizen information. Survival information is information which communities need to survive in specific contexts and seeks to address challenges relating to health, housing, income, legal protection, economic opportunity and political rights. Citizen information, on the other hand, is information that citizens need to enable them to participate effectively in social, political, legal and economic processes in their communities (Islam and Mezbah-ul-Islam 2010; Stilwell 1989, 2001).

Critically, Stilwell (1989: 267) asserts that community libraries should be established by the communities themselves – "made by them, for them and in their image" – to succeed.

The community libraries vary in size of catchment, collection and building (Auckland City Libraries 2008). However, most community libraries are hosted on premises donated by the communities while the public library service provides the reading materials (Atuti 2001; Mostert 2002). Stilwell (1989) explains that due to the uniqueness of community needs, oral and other non-book resources are important for community libraries. She adds that such services are typically imaginative, stimulating, innovative and unconventional. Atuti (2001) further explains that community libraries are developed to respond to unmet information needs arising from demographic factors and a dwindling resource base in the public library service systems and seek to fulfil the following aims:

1. To encourage the community to identify its information needs and to involve its participation in the establishment of such new sources of information for their use and mutual benefit;

2. To be an advocate for society's appreciation of the role and importance of library and information services in modern socio-economic, cultural and political life; and

3. To develop partnerships and strengthen co-operation with the community, and to utilize available community resources (funds, buildings) through mobilization and to supplement government efforts in providing library and information services in rural areas.

Most community library services are offered in communities in which no alternative library services exist due to socio-economic or political factors. Stilwell (2001) explains that in South Africa, for instance, community libraries emerged as a response to apartheid policies which deprived the majority of the citizens of access to public library services. It is also evident from the available literature that most community library services are offered in disadvantaged or rural areas in which library service accessibility is low. For instance, Islam and Mezbah-ul-Islam (2010) explain that community libraries in Bangladesh serve rural communities which face crucial shortages of skilled human resources, logistical support and infrastructure. Jones (2009) also suggests that community libraries can act as neutral sites for knowledge exchange and empowerment, especially for marginalized populations such as women in developing countries. She also adds that in some cases, community libraries have also played a vital role in promoting literacy and reading cultures within

their communities. Magoro (2009) supports Jones' view (2009) that community libraries can be used as agents for community development and education. However, citing the case of Tshwane Community Library and Information Service in South Africa, he adds that most of the community libraries are too under-funded to realize their full potential.

Stilwell (1999, 2001) explains that community libraries differ from conventional library services in many respects. However, she categorizes the major differences as being exemplified through: 1) the nature and content of materials; 2) intensive librarian-user interaction; 3) deeper linkages with community-based groups; 4) the political nature of the libraries buttressed with the principle that everyone has a right to equal access to information and national resources; and 5) participative management involving librarians, community leaders and community groups. Mostert (2002), on the other hand, suggests the characteristics that distinguish community libraries are: 1) inclusion of more community involvement in the management of the libraries; 2) allocation of funds to purchase specific materials needed by the community; and 3) the development of specific skills to enable the library staff to render a pro-active community library service.

Stilwell (1999), citing Bunch (1984), suggests the common functions performed by community libraries are self-help, support for other information services or groups of information workers, simple directional information, referral, escort, practical help, advice, advocacy, community education, community action, outreach, and counselling.

Le Roux (2001) explains that community library models can sometimes be combined with school libraries to support both the schools and the communities around the school. The location of such a library is either the school building (found mainly in the rural settings) or a multi-purpose community hall (mainly in the urban areas).

3.1.3 Embedded model

Dugan (2008) explains that although the concept is indeed old, the label "embedded librarian" does not have a long history in academia. She adds that the term might have been borrowed from the US military's practice of integrating journalists in their ranks during armed conflicts. This is an effort to expose the journalists to the actual combat to enable them to "tell the story" from an eyewitness's point of view not just from soldiers' reports. She quotes a number of scholars and sources (such as

Greppi 2003; Knightley 2004) to explain that this practice became more pronounced during the US army operations in Iraq around 2002. This development was as a result of the pressure applied by the US media on the military to grant the media more access than had been the case during the Gulf War in Iraq and the invasion of Afghanistan in 1991 and 2001 respectively. Consequently, the term "embedded reporter" was used for the first time in 2003 to refer to the over 775 reporters and photographers who were engaged in the battlefront and considered part of the combat team in the latest US invasion of Iraq. Dewey (2005) explains that the concept of embedding implies a more comprehensive integration of one group with another to the extent that the group seeking to integrate is experiencing and observing, as nearly as possible, the daily life of the primary group. She adds that embedding requires more direct and purposeful interaction than acting in parallel with another person, group, or activity.

Chilton (2009) also explains that the concept of blended librarianship, as we know it today, was first proposed by Steven Bell and John Shank in 2004 but she admits that this could not have been the first time this concept was introduced into librarianship. Dugan (2008) agrees and also points out that the concept is not new to librarianship. However, she adds that its perception has been diverse. Quoting Bartnik (2007), she explains that while some librarians have used the term to describe physical office relocation others have used it to refer to the inclusion of Instant Messenger (IM) services on library websites targeting specific categories of users. York (2006), on the other hand, uses the term to refer to the placement of a librarian assigned to a class as part of an online distance education programme as a co-designer or teaching assistant of the course. Ramsay and Kinnie (2006) also use the term to describe the services offered to online distance learning programmes. The term is most commonly used, though, as a label for the practice of establishing a regular presence of a librarian in an on-campus class as a member of the teacher-student team, from the start of the semester through to the end (Dugan 2008).

The embedded library model facilitates the delivery of decentralized services to the users at a closer proximity. It involves creating desk spaces for liaison librarians among the user reading spaces or in some cases near the users' offices such as in a research institution or university. Freiburger and Kramer (2009) suggest that the liaison[56] librarian should have a special understanding of the subject

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[56] These librarians work as subject librarians except that their bases of operation are located closer (physically) to the users.

matter of the department or user area s/he is embedded into. For instance, if the liaison librarian is attached to a medical unit, then s/he needs to have had some training in natural sciences or even medicine itself. The idea is that the embedded librarian should be incorporated as a member of the team who participates in the team activities and is briefed adequately (Chilton 2009; Shumaker 2009; Talley 2009).

The liaison librarians are ordinarily absorbed into the operations and structures of the departments they are attached to, to the extent that they become members of that team, attending their meetings and participating in their planning. The higher level of bonding with the users attainable through embedding enables the liaison librarian to offer customized services to the users who consider the librarian as one of them. This model also facilitates ready and direct feedback from the users on the services and their needs. Moreover, it also makes the library more visible to the users and has the potential of enriching and increasing library usage (Kinnie 2006; Chilton 2009; Freiburger and Kramer 2009). Dewey (2005) also asserts that "embedding oneself [library] at as many venues as possible will ensure that library staff, collections, and services are more fully integrated into all aspects of the institution's life."

Shumaker (2009) identifies some of the key features of the embedded library model as: 1) Location of the service among the "customers". What is important here is the physical and psychological proximity of the embedded librarian to the users s/he is supporting. 2) Funding for the embedded library service ideally comes from both the institutional library provisions (budget) and the supported unit. This enhances funding adequacy and ensures better services. 3) The embedded librarian is supervised closely by the appropriate authorities within the supported unit but ultimately by the assigned officers in the library hierarchy. There is debate on this arrangement but it ensures that assessment of the librarian's performance is done by the people served and not entirely by officers who may not have a day-to-day experience of the services offered. This has the potential of improving the service delivery. 4) The embedded librarian participates actively in the activities of the department s/he supports.

The literature reviewed also revealed another category of embedded library service model in academic libraries in which the librarians are embedded into courses to support the academic staff and students to locate course text, reading materials, and also to conduct customized information

literacy training for the same (Ramsay and Kinnie 2006). Hall (2008) explains that embedding librarians into specific classes improves research especially on locating and use of credible information sources.

Overall, for the embedded library model to succeed, Freiburger and Kramer (2009) suggest that the liaison librarian needs strong interpersonal skills and an understanding of the cultures of the organizations and disciplines s/he supports. The liaison librarians should also be motivated and enthusiastic; with a strong personal service orientation. They also recommend that the liaison librarian needs higher librarianship training and suggest at least a Master's level degree. Ideally, the liaison librarian should also have background knowledge of the terminology of the scientific discipline or study area she/he is supporting. Freiburger and Kramer (2009) also report that there are already many cases in which professionals, with added librarianship training, have become liaison librarians to support their contemporaries. An embedded librarian knows the needs of the unit, how decisions are made in the unit as well as who makes them. They need to influence relevant decisions through effective communication, information sharing, and being visible to the decision makers. Significantly, given that they have background understanding, and perhaps experience, of the discipline they support, embedded librarians have the potential of accurately meeting the needs of the users (Shumaker 2009).

Another benefit of the embedded library model is that it attracts the support of the departments easily. In grant supported environments, the aided-departments include the library's needs in their proposals and intertwine it with the operations of the departments. Shumaker (2009) explains that the embedded service model enables librarians to overcome the barriers that have sometimes existed between them (librarians) and their customers and to make the services truly and directly valuable. York (2006) also adds that this model of library service creates a collaboration environment in which the lecturers and the librarian enrich each other and their respective services.

There is debate as to whether embedded librarians should be considered librarians or members of the professions and teams they support. Shumaker (2009) asserts that it is true that embedded librarians are members of other teams, groups, and units and are indistinguishable in status or value to the group from any other members, except for the fact that they bring a unique awareness of the importance of information and knowledge, and skill in applying the same to improve group

performance. However, he (Shumaker 2009) adds that regardless of where they work from or the institutional arrangements they are involved in, embedded librarians still have unique librarianship skills that make them librarians. He concludes that one doesn't have to work in a conventional library setting to be a librarian and emphasizes that what makes one a librarian is the skill-set acquired through appropriate education and the application of these skills wherever they work.

Hall (2008) explains that embedded librarianship takes time and resources and should be introduced with proper planning. It also requires the full support and trust from the team to be supported which often requires time to cultivate. York (2006) also shares the lessons she has learnt from applying this model hereunder which other current and potential embedded librarians should also benefit from:

1. Mark all library or research-related assignments on a calendar because one is likely to forget the deadlines as the pressure of work increases;
2. Anticipate needs of the users and make adequate prior arrangements to satisfy them when they are finally made; and
3. Be constantly in touch with the people s/he supports and "remind them" of [his/her] existence and value.

Dugan (2008), on the other hand, recommends the following best practices for embedded librarians in academic institutions. All embedded librarians should:

1. Meet with the professor they are supporting before the start of the semester to plan for a more structured and regular presence in the class;
2. Decide up-front with the professor how much they should contribute during group sessions;
3. Coordinate resources with each other and use the course page to post timely information focused on the requirements of the current assignment(s);
4. Be more assertive in giving guidance to resources, especially search strategies in subscription databases;
5. Set appointments to meet with students at least once during each of the assignment periods and monitor the progression of the students' learning;
6. Meet with the professor mid-semester for evaluation and possible course modifications; and
7. Contribute to evaluation of the research with the professor, with the elements of that evaluation including information literacy.

The embedded library model is currently gaining popularity among research and academic institutions in many parts of the world. Rosemary Kuhn[57] explained that during an internship programme she undertook in some North American academic libraries, she noted that most of the libraries employed the embedded model. She also added that there are ongoing initiatives to develop a library model for South African academic and research institutions and hinted that the embedded model seems to be the preferred model.

3.1.4 Bookstore model

In this model information resources and books are stored by topic not by call numbers as in other library models (Rippel 2003; Sauers 2007). Some scholars have called this arrangement the reader-interest classification. It is not a classification of the fields of knowledge but a shelving arrangement based on broad areas of interest which relate themselves to the needs of the library users. These broad areas have been designated as interest categories (Sapiie 1995; Thomas 1995; Huff 2006). The resource arrangement emulates the pattern used in bookstores which is reputed to facilitate ease of access of the items. The users of this library model do not use catalogues to locate resources; instead they just browse the shelves (Sridhar 1986). The ease of access is enhanced through the use of attractive and big signage, bright light displays, pull-outs, and other "way-finding" aids (Coalwell 2006). Generally, users of bookstore model libraries serve themselves and even check-out resources in some cases using ICT facilitated library management systems. This self-service makes the bookstore model library services much faster than their other counterparts. However, the pace of service largely depends on the reliability of the ICT systems supporting the services. It may also be influenced by the availability of ICT access points otherwise the queues may be longer than the case is in library models offering mediated services (Sridhar 1986; Coalwell 2006).

The bookstore model library limits the reading space in an effort to minimize the time users spend in the library. Indeed, the model emulates the actual bookstores where the best an interested customer can do is to peruse the books as fast as they can. It is reported that many bookstores used to stop customers from taking too long with the books and "blocking the aisles". The rationale behind this was that if a potential customer read the entire book, or most of it, in the store, he would not buy it. Though modern bookstores have changed, the space allowance is still limited to

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[57] Rosemary Kuhn is a subject librarian at the University of KwaZulu-Natal. This information was obtained from her through email discussions on 24th July 2009.

the extent that potential customers do not normally have the comfort to review the book exhaustively within the store (Woodward 2005; Coalwell 2006). Rippel (2003) also explains that bookstore model libraries utilize strategic shelf arrangement by applying the common rule that users are normally attracted to shelves in the first 5-20 steps to their right upon entering a library. Most important books are kept in this area to ensure higher visibility and usability. The publications are displayed "face-out" not "spine-out" as the case is in most libraries in which the call numbers are displayed on the spine (Bartlett 2008). Libraries using this model have modernized in line with the changes in the design and structure of modern bookstores which may set aside some reading space away from the shelves but the philosophy of this library model still remains to facilitate borrowing of information resources for use outside the library premises.

As a general rule, bookstore model libraries do not hold stocks of reference material. The libraries also strive to keep the latest publications only. The collection development is determined by the usage. Actually, the libraries using this model do not pride themselves on full shelves since they focus on getting the resources outside the library. Generally, the collection is leaner than in other library models giving the resources on the shelves better visual euphony. The bookstore model libraries are also reputed to exhibit higher customer service sensitivity than other library models. For instance, when customers enter their section, staff makes contact with the customer to show help is near. In many libraries, by contrast, staff members are not trained to greet people walking through the front door or invite patrons to ask questions (Rippel 2003). Further, they are likely to allow users to bring in drinks into the library premise, provide trash cans, and provide snack centres and coffee shops. The bookstore model libraries are also known to display their strengths strategically in the reading areas. The focus is normally on convenience of use and speed of service as well as freshness of collection such as new arrivals or new formats (Coalwell 2006). The libraries invite feedback from the clients on the resources. Whenever patrons mention liking a book, staff members ask patrons to write a one or two sentence recommendation on a recommendation card. Library staff and patrons write recommendations on the cards which are placed in the book with "Recommended book" written on the top of the card showing above the top of the book. Recommended books are placed on shelves in slotted end-panels. Many patrons go straight to these displays as soon they enter the library to assess suitability of the information resources before going to the other sections of the library. When recommended books are checked out, the "recommendation" cards are removed and kept at the circulation desk to be replaced in the books on check-in (Rippel 2003).

The bookstore model libraries also use aggressive marketing techniques such as bright posters, unique book arrangements and shelf positioning. Displays are so conspicuous and numerous that there is hardly any space left for seats or wide aisles. Significantly, bookstore model libraries have a fresh attractive look due to the graphics and displays that are changed frequently to point the users to the new material in the library. They are also reputed to have better and brighter lighting than other library models. Some scholars also point out that bookstore model libraries smell better than traditional libraries the air of which may contain mildew and have a musty odour. Such smells are unpleasant for everyone and unhealthy for many. Some propose that libraries should be scented to remove the offensive smell that may keep users from the library (Rippel 2003; Coalwell 2006). It is possible, however, that there could be some library users who have a sentimental attachment to the typical traditional library smell and cannot perceive a serious library without it. Just like the smell of medicine in hospitals, some typical library smells may not be eliminated completely. The good practice, however, is to control the smell levels to keep the library fresh and hospitable. To achieve this, opening of all windows and doors and selective use of fans is recommended to blow in clean air when and where possible (Rippel 2003).

The location of bookstore model libraries is easily accessible. This model of library service literally follows the users as they move. The location is often influenced by proximity to schools, bus (transportation) routes and shopping centres. While traditional library sites are generally determined by the county or municipality planning and perhaps based on the available free land, bookstore libraries are based on thorough demographic analyses to determine the location with easiest access (Woodward 2005).

Rippel (2003) suggests that bookstore model libraries should have background music. He is aware of the controversies this is likely to elicit given that most library environments are quiet. However, he justifies this suggestion by quoting psychological experiments by North, Hargreaves and McKendrick (1999) and others to demonstrate the influence of music on customers in restaurants and supermarkets and asserts that these experiments proved that slow background music positively influences the sale of products in shops. He concludes that good background music may have the same effect on library users and may increase the frequency and intensity of library usage. Already, there are a number of libraries which have introduced piped music in the reading areas. Though some have reported that the libraries have been "very busy" since the introduction of the music,

others say that music has "chased" away some patrons especially the older ones who, for instance, complain that they cannot concentrate on choosing their books because of the "thumping background beat" (Berlins 2009). Others also suggest that those who want music while they browse can have their own, for example by using iPods, without disturbing anyone else or the library staff having to overcome the difficulties of reconciling differing tastes (Roper 2009).

Staff members of a bookstore model library are trained to offer any service in the library. They are able to assist the customers promptly without directing them elsewhere. As with an actual bookstore where the shop attendants are sufficiently knowledgeable to assist any customer on the aisles, bookstore model libraries ensure that all the librarians are cross-trained. This training also yields many benefits. For instance, training circulation and reference staff in the technicalities of interlibrary loan would enhance their ability to answer questions and advise patrons about the interlibrary loan process. Similarly, cross-training cataloguers and reference staff could yield better cataloguing for use by reference staff and improve reference staff's understanding of the access facilitated by cataloguing (Rippel 2003).

The major disadvantage of this model is that sometimes it is hard to locate a book once it has been misplaced. In the conventional model, the use of call numbers makes it easier to detect a missing book and pick it out from where it may have been mis-shelved. Again, it tends to be more expensive than the other models given that the focus is on new information resources which are generally more expensive. This library model is most suitable for special libraries and some categories of public libraries (Rippel 2003; Woodward 2005). It works better for libraries with smaller collections.

3.1.5 Library Outpost model

This model was popularized by Nate Hill in 2008. The Library Outpost, as a library model, is aimed at transforming public libraries in urban centres to offer better services to their users. The idea was to create library outposts in places where people are already congregating such as business centres, schools, apartment complexes, or department stores (Koerber 2008). These outposts are streamlined library buildings, with little to no print material but lots of space for computers and for events to take place. According to Hill (2008), the salient features of the model are:

1. **Strategic location** – The Outpost is a small (not more than 1500sq ft) "storefront" library located in central commercial areas, a business improvement district, or a transportation hub. Rather than bring the patrons to the library, the Outpost model seeks to take the library to the patrons through physical proximity. The outpost library space, though small, is easily transformable; one moment it may be a silent reading room, another moment it may become a performance art space, and another moment a platform for a community group meeting.

2. **Extended service hours** – The Outpost library ordinarily remains open from 8am until 10pm, giving the user community longer access to library materials, exhibitions, and programmes during the times most convenient to them.

3. **Collection available via online holds system** – Rather than providing a localized browsing collection, the Outpost connects users to all library materials via the catalogue.

4. **Reference service** – Outpost staff provide exceptional reference services using online databases and Internet searching strategies. All reference sources are electronic.

5. **Wireless access and digital library content** – The Outpost is a comfortable Wi-Fi[58] zone to work in from a table or play in from a lounge chair. Through the patrons' portable devices they can access digital content via the library website and other online resources.

6. **Programming and exhibition space** – The Outpost features exhibitions that pair the library's collection and services with art related to the community interests. The space is also flexible enough to accommodate performances, lectures, concerts, discussions, and even meals during evening hours.

Hill (2008: Now the longer explanation) also explains that the unique feature of the Outpost model is that it has no local collection and adds that "every single piece of print material (with the exception of magazines and newspapers) is an item that was requested online for pickup at the Outpost location." This in turn frees up most of the 1500 sq. ft. library space for programmes, exhibitions, classes, movies, concerts, community meetings, serving coffee, and virtually any community-building, social capital-creating activity. Hill (2008) concludes that the library of the 21st Century has to maintain a physical presence, but that presence cannot always be in the form of a well-organized, publicly accessible book "warehouse" with specially-strengthened floors to support the physical collection. He is quick to add, however, that these Outpost model libraries will not

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[58] Wireless network technology facilitating easy Internet connectivity. It is used here to imply a convenient Internet connectivity zone which the library patrons can use to access the Internet.

replace or work in isolation from the physical libraries but will operate as nodes in that network. He says:

> An Outpost is just one node in a network of different physical service points. Just as the car-culture era bookmobiles didn't replace library branches, neither will Outposts. The important thing is getting these little service nodes into the community in the right places, and giving people as much as we possibly can out of them. Location is everything in the urban environment (Hill 2008: Now the longer explanation).

To justify the need for this model, Hill (2008: Now the longer explanation) uses the example of the Brooklyn Public Library to explain that most library branches were built in the "first two decades of the 20th century" and since then entire communities have "moved, disappeared, shifted, and grown" but library facilities have not been able to follow the people as community centres and business districts migrated to new areas. He points out that many large, beautiful public libraries are located in desolate and remote corners of their neighbourhoods. Regrettably, the working adults who live and labour in the rapidly developing communities have moved out of reach of the libraries and have become potential patrons rather than active patrons. In his view, this is where this model comes in to take the library to the people. He says:

> Libraries need diversified service points that address the needs of their immediate communities, not cookie-cutter branded environments. In some locations, a good Outpost facility could be nothing more than a room full of public access computers because that is what THAT community needs (Hill 2008: Now the longer explanation).

Hill (2008) explains that storefront library facilities have been tested in the past with limited success but adds that the Outpost model takes advantage of emerging technologies to reconsider the distribution of library content and materials and invent itself as something entirely different. Hill (2008) also claims that presently a few libraries such as Houston Public Library which has a few small, tech-heavy locations; and Contra Costa Public Library which offers material vending machines in the BART[59] stations, have opened some storefront facilities that have been received enthusiastically by their communities.

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[59] BART stands for Bay Area Rapid Transit which is a heavy rail rapid transport system

Kesselman and Anfenson (2008) aver that the Library Outpost model generates some benefits for wider library service delivery. Basically, the model enables librarians to: 1) Extend services and access to users; 2) Be where the users are; 3) Be moveable and flexible; 4) Be visible affordably; 5) Help users overwhelmed by libraries; and 6) Partner with the library communities in offering services suitable for their contexts. They add that from their experience in experimenting with the model, many people like the services. They also find that these outposts constitute important outreach efforts for the libraries and play a critical role in marketing the library and librarians. However, to succeed, the Library Outpost model needs to be developed in partnership with the communities. User studies to establish the real needs and contexts of the neighbourhood as well as publicity are also critical to its success. However, they (Kesselman and Anfenson 2008) warn that the Library Outpost model employs inefficient use of staffing and therefore requires more people. The model is also not scalable to other locations. Blumenstein (2008) also points out that implementing the Library Outpost model is expensive leading some libraries to drop it midstream.

3.1.6 Mobile library service models

Butdisuwan (2000) defines mobile libraries as all travelling or movable library activities in any formats such as large enclosed trucks or vans or large motor vehicles equipped with shelves and a staff enclosure to visit rural districts or remote areas where there is no other library service at specific times on a certain day or days of the week. Depending on the society and operational environment, other modes of transport such as horse-carts, camels, engine boats, motorcycles or bicycles may be used to transport the library materials to the users in the villages or other places far away from the actual library premises.

Mobile libraries can operate on an individual basis or as part of a regional or national network. They are normally part of a traditional library set-up. In fact, many of the mobile library services in operation today are offered as part of established public library services. However, there are also unique cases where individuals offer portable library services out of their passion for literacy. When they operate under a network – whether inter or intra organization – mobile libraries are able to exchange books and other information materials between them thus reducing costs of collection development while reaching their users with a wide variety of sources. In such scenarios, the libraries exchange whole collections or big portions thereof going beyond the provisions of interlibrary loan systems (Hue 2000).

Mobile libraries are suitable for poor underserved neighbourhoods or counties where the authorities responsible for library services cannot afford to build and operate a full library. It also works for regions where the population is too low to justify the establishment of a fully-fledged library. Mobile libraries are also suitable for users whose way of life cannot be supported by a "stationary" library. Such users like nomads in North Eastern Province in Kenya move from one place to the other depending on weather and security conditions. In such settings operating a physical traditional library is not suitable as the potential users are constantly migrating. Conversely, they can benefit from a mobile library which follows them and delivers the information resources to them wherever they are.

Mobile libraries are also perceived to be economical; convenient to the users who do not have to travel long distances to the permanent library premises; and more affordable especially because the authorities do not have to build a complete library in all the regions. Some scholars are also of the view that mobile libraries easily attract greater support than their counterparts. This has been attributed to the fact that individuals and organizations can easily donate components of a mobile library such as unused train carriages or buses. It is also possible for interested supporters to volunteer labour. It has also been argued that it is easier to promote mobile library services than other library models (Lerdsuriyakul 2000).

The major challenges the mobile library model faces include difficulty in meeting most users' needs in a limited physical space; operating on strict schedules which limit their access; and difficulty in maintaining membership inventories. The libraries are also exposed to harsh weather conditions such as high temperatures, wind, dust, and rainstorms resulting in rapid wear and tear of the resources (Lerdsuriyakul 2000).

Many forms of the mobile library model are being used in various places in the world today. Some of these include:

3.1.6.1 Mobile Train Library in Thailand

This model utilizes train carriages and platforms to deliver information resources to the commuters and the communities living around the rail network. The commuter service is pleasant because travellers utilize the hours-long trips on trains to access library services. Communities who live or

work near railway stations also receive services when the trains stop at the stations. The mobile train libraries provide opportunities for various learning activities and resources such as books, audio-visual aids, exhibitions, learning groups, and reading promotion activities. Basically, the mobile train library model is designed to extend the reach of libraries to include the often-excluded rural populations with library services and reading materials. It is also aimed at nurturing a reading culture and enhancing literacy levels in the country (Butdisuwan 2000).

These libraries are designed in different ways depending on the primary services offered. Some operate specialized carriages customized as libraries with shelves and other library facilities designed as an ordinary library van. Such carriages can be left in various stations for a day or two to serve the residents of the area before moving on to the next station. When the carriage has gone the full length of the trip, it comes back on the same route and allows the users to return or exchange materials. A similar service is being proposed to be delivered on buses and floating vessels to benefit people living around the bus-routes, rivers and other water bodies. Similar mobile libraries equipped with modern communication technologies and information materials are also in operation in China. Other designs can include sections of carriages used as storage for reading materials that commuters can borrow and use only for the trip. These materials are collected at the end of the trip (Zhaochun and Miaohui 2005). Whatever the design, this library model has the potential of reaching many people who would otherwise not be reached effectively through the other models of library services.

3.1.6.2 Biblioburro in Colombia

This is a travelling library service using two donkeys (Alfa and Beto) to distribute books and other information materials by Luis Humberto Soriano in La Gloria, Colombia. Developed in the late 1990s with just 70 books, the Biblioburro had expanded to include at least 4,800 books by 2008. The idea came to Mr Soriano when as a young teacher he witnessed the transformative power of reading among his pupils in the conflict-prone country. He lends out the reading materials and also reads the story books to children who wait for him in groups as he travels along with Alfa and Beto. His collection mainly contains story books, dictionaries, text-books, encyclopaedia and novels (Martine 2008; Romero 2008; West 2008).

Romero (2008) explains that Soriano's Biblioburro is a whimsical riff on the bookmobile. It is a small institution: one man and two donkeys. He created it out of the simple belief that the act of

taking books to people who do not have them can somehow improve their lives and ultimately lift the economy of this impoverished country. Soriano believes that books change lives by empowering the readers to deal with the pressing issues that hinder them from maximizing their potential to a dignified livelihood. His passion is deep and he has committed his life, savings and energy to this project to build the literary capacity of the masses. Whereas many other people may be having the same intentions but are held back by bureaucracy, procrastination and the need for elaborate implementation plans, Soriano is doing what he can with what he has, now.

Mr Soriano faces many challenges including loss of his books (some borrowers do not return them; others steal them; he has also been robbed of one title), personal risks (he has suffered in the hands of bandits who tied him to a tree and stole his books) and general security risks but he is not deterred. He believes that if he can interest just one person in reading a mundane news item – say, about the rising price of rice – then that would be a bold step forward (Romero 2008).

3.1.6.3 Llama Libraries in Peru

This was a mobile library service aimed at reaching the remote rural farming communities in the Andes of Peru. Due to lack of adequate finances to build and operate normal libraries, some of the farmers volunteered to act as librarians and also offered their houses to keep the library material in. The houses storing the library material became known as house libraries. Each volunteer librarian was responsible for 20 books (Metcalf 1982). The farmers visited the house library in the neighbourhood to read or borrow the books. Metcalf (1982) also explains that every month, the volunteer librarian took back the 20 books to the main library in Bambamarca[60] and obtained a new set. Because of the dilapidated road network in this region, the llama[61] was the preferred mode of transport for the books between the house libraries and main library. In order to protect the collection from wear and tear, each book was stoutly bound, covered with cellophane and then put in a plastic bag (Metcalf 1982). The collection was mainly composed of simple reading material covering fiction, agriculture, rural crafts and general knowledge.

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[60] Bambamarca is the headquarters of a district by the same name in the Bolivar province of Peru (Wikipedia Contributors 2009c).
[61] Llama is a pack animal used by the natives of the Andes Mountains in Peru and other places in South America (Wikipedia Contributors 2009d).

3.1.6.4 Donkey Mobile Service in Zimbabwe

This mobile library model was initiated in 1995 by Zimbabwe's Rural Libraries and Resources Development Programme and has recently been extended to provide the Donkey–Drawn Mobile Cart Electro-Communication Library, offering access to radio, television, telephone, facsimile, email and Internet services powered by a solar unit installed on the roof of the cart (Kabwato 2009).

The Donkey–Drawn Mobile Cart Library consists of a closed cart designed to provide proper storage facilities and hold books on shelves so that when the vehicle is parked the books can be accessed by readers. The units have solar panels on the roofs and enable the libraries to offer basic electronic services such as Internet access as well. This library model is used to provide library services to villages and city suburbs without library buildings. The donkey mobile carts can be used in all sorts of terrains and can be attached to a network system linking several towns, villages and schools. The donkey mobile libraries operate on set dates and are accessible at specific times. This could be once a month or once a term depending on road conditions or distance between target communities and the hub station. These mobile libraries generally allow users to borrow books until the next visit. Library staff could either be trained librarians or volunteers with basic library training and skills obtained on the job (Kabwato 2009; Wikipedia Contributors 2009a). This model of library service has been replicated in Kenya and Ethiopia. It has also being considered for adoption in the Eastern Cape region in South Africa. Besides its simplicity and affordability, it is also adaptable and usable on narrow roads that bigger motorized vehicles cannot pass through. Consequently, it has the potential to extend library services to rural areas that are not easily reachable by other means.

3.1.6.5 Camel Mobile Libraries in Kenya

The Camel mobile library service is one of the unique non-motorized mobile library service in use today. It was launched in 1996 and is operated by the government-owned Kenya National Library Service (KNLS) (Atuti 2002; Passchier 2002). Located in the arid, sparsely populated and least developed North Eastern province, the service is suited to meet the information needs of the nomadic pastoralists who live in the province.

Passchier (2002) explains that the Camel mobile library service was launched using three camels and had been expanded to six camels by 2001 and later on to twelve by 2007 (Majtenyi 2007). It operates from a "static" branch of the KNLS in Garissa town – the North Eastern provincial headquarters –

from where it covers a radius of about 20 km. The service primarily targets pastoralists, schools, adult literacy programmes and refugee camps.[62]

The service is currently enabling pupils, students and other members of these communities access to information materials – largely books – easily. The library service operates four three-camel caravans. The camels travel to four settlements per day, four times (Mondays to Thursdays) a week. From Fridays[63] to Sundays, the camels are released to go and feed, recuperate and checked for any signs of disease and receive any necessary treatment. The patrons borrow books and return the same after two weeks (Hamilton 2005; Majtenyi 2007).

According to the KNLS[64], a day starts with the loading of books and other library materials into boxes, which carry about 200 books each. The books are then taken to designated areas in a camel caravan. One caravan comprises three camels each with specified tasks as follows: one camel carries two book boxes; another carries a tent, reading mat, two chairs and a table; the third camel is used as a spare in case any of the other two has a problem. A librarian in charge, two assistants and a skilled camel herdsman lead the caravan. On arrival, the books and other items are unloaded, the tent is pitched and the books are then displayed on the mat. As it is the culture of the local people to sit on mats, a floor mat is also provided for those needing to make quick references to the materials. From this makeshift library all the basic library services are provided and at the end of the day, all the items are loaded on camels, which head back to the library in preparation for the next day's programme.

The service is compatible with the nomadic pastoral lifestyle because it targets the community in their natural focal points, the 'Manyattas'[65] and other groups at the administrative centres. The impact of this model of delivering library services has been profound as demonstrated by an assessment commissioned by the International Federation of Library Associations and Institutions (IFLA) to ascertain its viability which declared that it is effective in providing services to the residents of this seemingly neglected region (Atuti 2002; Passchier 2002).

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[62] This province holds thousands of refugees mainly from war-torn Somalia (which it borders), Sudan, Ethiopia and Eritrea, among other countries.

[63] This region is mainly inhabited by Muslims who worship on Fridays hence the break.

[64] Information obtained from interviews with some of the KNLS officers involved in the service and from the KNLS website – http://www.knls.or.ke

[65] These are temporary settlements used by nomadic groups in Kenya as they move from one place to the other in search for pasture for their animals. Sometimes, they are also forced to move due to security concerns.

The use of camels as opposed to motorized means of transport is due to the poor road network in the area as well as insecurity given that this province borders Somalia which has been without a formal central government for almost 20 years now. The main challenge this library model faces is the harsh weather conditions which increases wear and tear on the information resources. It also lacks an adequate collection; lack of awareness of the service by the communities it seeks to serve due to their lifestyles and lack of adequate communication infrastructure in the area; it is also labour intensive; and some of the camels occasionally fall ill thus disabling delivery of the services during the period of sickness (Atuti 2002).

3.1.6.6 Cupboard Library Service in Kenya

This service model is being offered by the KNLS in Kenya's Laikipia[66] district for institutions that have no libraries. In this model, the institution buys the cupboard and the library supplies the books, which are kept in the cupboard for use by the students. This serves as a starting point for the development of a full-fledged library in that institution. The loan period for the books is one month.

3.1.7 Information Commons

This is a model of library services mainly embraced by academic libraries and emanating from the understanding that there are certain pieces of information which should be known by everybody as a common property of the society. To perpetuate and benefit from such common information requires the use of an open, free, flat, peer-to-peer network that enables anyone – individual, small group, or large group – to come together to build a common information environment (Kranich 2004; Leighton 2003).

Lippincott (2006) explains that the Information Commons is a special library place and often occupies one floor of a library facility, generally a main service floor, which often includes or replaces the library's reference area. She adds that most Information Commons are currently in library spaces that have been renovated though a minority is in totally new buildings or non-library buildings.

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[66] This is also a semi-arid region inhabited by the pastoralist Maasai community. The district suffers from insecurity caused by cattle-rustling and inter-clan rivalries.

Though most of the reviewed literature defines Information Commons as renovated library spaces, the term also refers to a library service that combines flexible instructional settings and collaborative learning spaces with a full range of digital library resources, productivity software applications, and expert professional and technical assistance. It accommodates diverse learning styles, including formal classroom instruction, small group coaching, individual research consultation, and drop-in assistance (Leighton 2003; Lippincott 2006).

Lippincott (2006) identifies three major distinguishing characterizations of Information Commons as:

1) Information Commons use pervasive technologies more than traditional libraries do. For instance, she explains that while most academic libraries have computers linked to the Internet and space for laptops, the public computer workstations in the libraries are restricted in terms of software as many of them only allow the users to access bibliographic information. Conversely, computer workstations in Information Commons have other applications that enable the users to do more than just access the library's catalogues. She further explains that in an Information Commons, the underlying philosophy is to provide users with a seamless work environment so that they may access, manage, and produce information all at the same workstation.

2) Traditional libraries have focused on providing quiet space for individual study. Even where group study rooms exist, they are normally considered a peripheral feature of the library. In an Information Commons, however, much of the space is configured for use by small groups of students, reflecting students' desire for collaborative learning and combining social interaction with study. Besides, Information Commons frequently provide furniture built to accommodate several people sharing a common computer and provide large tables where several students can use their laptops while working together. Information Commons also provide comfortable seating areas with upholstered furniture that encourage informal meetings, cafés with food and drink, and group study rooms, often with a computer and screen, so students can work together efficiently on projects.

3) The range of services in an Information Commons is broader than in a traditional reference area. Significantly, the library staff members also assist with users' technology needs, not just their information needs. For instance, Information Commons that include multimedia production capabilities also provide support for those specialties. To ensure seamless service

delivery, a service desk in the Information Commons is generally jointly managed by library and information technology personnel. Students do not have to know the library's or computer centre's administrative structure to ask for help; they can ask questions at a central location and receive help on a wide range of problems.

Kranich (2004), on the other hand, also identifies the following as the key characteristics of Information Commons:

1. They are collaborative. They offer shared spaces, real and virtual, where communities with common interests and concerns gather;

2. They take advantage of the networked environment to build information communities, and they benefit from network externalities, meaning the greater the participation, the more valuable the resource;

3. They are interactive, encouraging discourse and exchange among their members;

4. Many offer services free of charge or at low cost;

5. Their participants often contribute new creations after they gain and benefit from access;

6. Their governance is shared, with rules and norms that are defined and accepted by their constituents; and

7. They incorporate democratic values. Free expression and intellectual freedom prevail.

Leighton (2003) also asserts that the Information Commons library service delivery model seeks to integrate information literacy and library research skills, provide pedagogical and technical support for the effective uses of information technology, support active and collaborative learning, improve the quality of instruction and teaching materials through outcomes assessment, and develop autonomous lifelong learners.

Most of the reviewed literature also points out that Information Commons may be abused especially by younger patrons who may use them more for their personal social activities than for academic pursuits. However, Lippincott (2006) while admitting that the Commons may be misused also adds that most of these students have lived with various media and have learnt to combine academic with social endeavour successfully. She adds that most of the students can easily multi-task.

In asserting the value of Information Commons in academic libraries, Lippincott (2006) makes the following comment:

> An Information Commons can be a collaborative learning space, not just a glorified computing lab; it can be a place to access, use, and create information, not just a reference area with rows of computers; and it can provide transparent user services, not fiefdoms of service points. Information Commons can enhance learning, provide an environment which is both academic and social, and fosters a sense of community on campus for students (Lippincott 2006:22).

3.1.8 Digital library model

A digital library is a library where the collection is processed and stored in digital formats facilitating electronic searching and retrieval of the same through digital devices such as computers. This model of library service has evolved for many years (Singh 2003) and is sometimes described as "paperless", "virtual", "library without walls", "electronic library", and "bionic library", among other names (Harter 1996). Though some scholars also describe digital libraries as those libraries which have more digital collections than physical ones, others assert that digital libraries only offer services electronically; they are virtual and do not have a physical presence. The reviewed literature also reveals the common understanding that most digital libraries contain highly specialized collections. It is also evident that digital libraries do not stock all the information resources locally but often collaborate with content producers to facilitate online access under appropriate terms and conditions such as licensing (Levy and Marshall 1994; Miksa and Doty 1994; Harter 1996; Leiner 1998; Prasad and Swarnalatha 2005). Baohua, Xiaoyan and Fei (2002) also suggest that the digital library is a major transformation of the traditional library model. They explain that this transformation is evident in the transition of the traditional libraries from passive to active use; from direct to indirect service; from providing information "blindly" to selective and accurate dissemination of information; and the provision of "rich" collections whose quality is enhanced through mixing and remixing by different collaborators such as librarians and users at various levels. Singh (2003) emphasizes that the digital library is more about the digital service environment than the digital content. He asserts that this environment brings together digital collections, people and services that support information processing and sharing. Prasad and Swarnalatha (2005), on their part define digital libraries as organizations that provide the resources, including the specialized staff, to select, structure; offer intellectual access to; interpret, distribute, preserve the integrity of; and ensure the persistence over

time of collections of digital works so that they are readily and economically available for use by a defined community or set of computers.

Some people confuse a digital library and a search engine. Amrelia, Murthy and Satyabati (2005) admit that digital libraries share an important characteristic with search engines – both are accessed online. However, they add that while search engines cover a wide range of subject areas, digital libraries are more narrowly focused around one or a specific group of disciplines. Further, unlike search engines, digital libraries use content-specific and highly descriptive metadata to describe each item in the collection. Thus, when a user conducts a search in the digital library, it is this metadata that is searched. Search engines, on the other hand, search "blindly" on an item's content and the results obtained may only indicate that a particular search term appears somewhere in the item, and not whether the overall content of the item is relevant to the search. They conclude that searches in a digital library produce more useful results, save users' time and effort in searching, and users can access the information found instantly.

There is also a popular perception that digital libraries should match and surpass traditional library services. Digital libraries should provide more than mere search facilities but should feature a high degree of selection of resources that meet criteria relevant to their mission, and they should provide services, including searches that facilitate use of the resources by their target community. They should maximize their borderless features to adapt their services and collections to the needs of the societies they serve. Digital libraries are also perceived as collaborative in nature and harness the inputs and evaluation of users and other stakeholders in actively conceptualizing, delivering and evaluating library services (Lagoze *et al.* 2005). Harter (1996) summarizes the properties of digital libraries as they progress from the traditional model in Table 3.1 on the next page.

Baohua, Xiaoyan and Fei (2002) identify the major characteristics of the digital library as: 1) The digitization of the information resources making them more durable and easily sharable; 2) Digital information transfer through communication technologies such as the Internet. Thus, the library users do not have to come to the library but can be served from wherever they are; 3) Limitless potential to share information across physical boundaries; 4) Focus on knowledge and not just information resources; and 5) Fast speed of service delivery. Singh (2003) also adds that digital libraries 1) have a higher variety of information resources; 2) provide localized access to distributed

content; 3) enable the same information resource to be shared by many people simultaneously; 4) have shifted paradigms from collection ownership to mere access; 5) emphasize quality and usefulness of collection as opposed to quantity; and 6) presuppose the absence of human intermediaries.

Table 3.1 - Properties of Digital Libraries
Source: Harter 1996

NARROW VIEW (based on traditional library)	BROADER VIEW(a middle position between the extremes)	BROADEST VIEW (loosely based on current Internet)
Objects are information resources	Most of the objects are information resources	Objects can be anything at all
Objects are selected on the basis of quality	Some of the objects are selected on the basis of quality	No quality control; no entry barriers
Objects are located in a physical place	Objects are located in a logical place (may be distributed)	Objects are not located in a physical or logical place
Objects are organized		No organization
Objects are subjected to authority control	Some aspects of authority control are present	No authority control
Objects are fixed (do not change)	Objects change in a standardized way	Objects are fluid (can change and mutate at anytime)
Objects are permanent (do not disappear)	Disappearance of objects is controlled	Objects are transient(can disappear at anytime)
Authorship is an important concept	Concept of author is weakened	No concept of author
Access to objects is limited to specific classes of users	Access to some objects is limited to specific classes of users	Access to everything by everyone
Services such as reference assistance are offered		The only services are those performed by computer software through Artificial Intelligence (AI)
Human specialists (called librarians) can be found		There are no librarians
There exist well-defined user groups	Some classes of objects have associated user groups	There are no defined user groups (or, alternatively, infinitely many of them)

Singh (2003) also explains that there are many myths about the digital library model. These myths include:

1) The Internet is the digital library – the use of the Internet as a tool for information sharing cannot equate it to the library;

2) One window view of all collections – it is really not possible to present one window view of all the collections;

3) The digital library provides equitable access anywhere anytime – the Internet is not ubiquitous and is unavailable in many parts of the world, especially in the developing countries. This compromises the real possibility of equitable access of digital content and services; and

4) Digital libraries are cheaper than conventional libraries – although digitization may reduce costs in certain areas of library service, it increases costs in other areas. For instance, though digital collections may be more affordable, the need for ICT tools to use them may keep the costs up.

Prasad and Swarnalatha (2005) state that the goals of digital libraries are diverse but include:

1. To increase the access to all types of information available to users - both offline and online;
2. To preserve the original documents and manuscripts;
3. To facilitate qualitative and quantitative resource sharing;
4. To improve the library services;
5. Ensuring the effective usage of information storage in digital format;
6. To promote the effective utilization of funds invested in the digital library;
7. To facilitate user acceptability from their desktops; and
8. To satisfy the five laws of library science by Ranganathan.

The major benefits of digital libraries discernible from the literature reviewed (Amrelia, Murthy and Satyabati 2005; Baohua, Xiaoyan and Fei 2002; Harter 1996; Lagoze *et al* 2005; Leiner 1998; Singh 2003; Wikipedia Contributors 2009b) include:

1. *No physical boundary*. The user of a digital library need not go to the library physically. This makes library use convenient and also facilitates fast service delivery. Besides, people from all over the world can gain access to the same information, as long as an Internet connection is available.

2. *Round the clock availability.* A major advantage of digital libraries is that people can gain access to the information at anytime, night or day. Digital services are potentially available on demand though hitches may arise from technology down-times, among other factors.

3. *Multiple access to services and collections.* The same resources and services can be used simultaneously by a number of institutions and patrons. This may not be the case for copyrighted material as a library may have a license for "lending out" only one copy at a time.

4. *User friendly interfaces.* Digital libraries provide user-friendly interfaces giving ready clickable access to its resources.

5. *Preservation and conservation.* Digitization is not a long-term preservation solution for physical collections, but does succeed in providing access copies for materials that would otherwise deteriorate from repeated use.

6. *Space.* Whereas traditional libraries are limited by storage space, digital libraries have the potential to store much more information simply because digital information requires very little physical space and media storage technologies are more affordable than their physical counterparts.

7. *Value addition.* Certain characteristics of objects, primarily the quality of images, may be improved. Digitization can also enhance legibility and remove visible flaws such as stains and discoloration.

3.1.9 Hybrid libraries

The term "hybrid library" was popularized by Chris Rusbridge around 1996 to describe libraries that have elements of the digital model existing alongside the traditional model (Oppenheim and Smithson 1999). Thus, hybrid libraries are neither purely digital nor purely traditional. This library model seems to have developed as a response to the dilemma traditional libraries faced when moving towards the digital model, regarding the non-digital information collection they already held. The hybrid library model is a means of integrating the traditional library with the digital library. A hybrid library model augments rather than replaces the traditional library model (Oppenheim and Smithson, 1999; Hsiung, 2008). Some authors (Pugh, 2004; Hsiung, 2008) also suggest that hybrid libraries are managed by hybrid librarians who combine information skills with technical computing skills to meet the dynamic user needs. Oppenheim and Smithson (1999) aver that most libraries

today are hybrid libraries which are transitioning gradually towards becoming more digital than traditional libraries over time although the pace of change cannot be predicted.

3.2 Summary

Very little is written about library service models. No wonder most of the professionals are unable to say which model they are applying in their libraries. Literature on this subject is also scarce and exists mainly in non-traditional formats such as blog entries and web pages. Nonetheless, the subject evokes heated debate, especially regarding which model is better than the others. Often librarians strive to support the model they prefer and are hesitant to embrace newer developments, especially relating to the application of emerging technologies in library service delivery, transformation from the provision of passive to active services as well as liberalizing the library environment to allow group work, and food and drinks.

This literature review reveals that library service models are continuously evolving. Each of the models cannot suit all service provision contexts. Therefore, none can be perceived as better than the others. However, it is also evident that some models may yield more benefits than others to a specific library community at a particular time. Libraries are careful to accommodate the prevailing characterization of the users. This cautious approach often results in the library being perceived as slow in adapting to the dynamic needs and lifestyles of the users.

Several trends in library models are discernible from the reviewed literature. These trends are as follows:

1. A shift from the static library service point as exemplified by the traditional model to mobile and virtual models which take the library services to the users;
2. Also a shift from offering physical information resources, as is the case with the traditional model through to the delivery of hybrid physical and virtual resources in the library outpost and bookstore models, to pure digital models delivering intangible services and products;
3. Less focus on collection development through ownership; more focus on collection federation and availability of mere access to information resources;
4. A shift from conservatism to liberalism in terms of classification (adoption of reader-interest approaches and folksonomies); open library membership; decentralized and shared control

between librarians and users; provision of shared spaces; borderless, minimum barrier, networked environments; and acceptance of food and drinks, among others;

5. Repetition of history with models moving from library services offered through the initiatives of individuals passionate in sharing knowledge (for example, ancient special libraries) through institutionalized libraries (most models fall here) and inevitably back to individual initiatives like the Biblioburro by Luis Soriano and library outposts by Nate Hill;

6. A full-cycle shift from free library services through fees based environments and inevitably back to free service delivery;

7. A shift from robust organization, quality control and standardization to less organization, minimal quality control and fluid mutational services and products;

8. Movement from less automation to more automation with the processing, organization and delivery of library services;

9. Adoption of marketing, customer care and public relations techniques in enhancing the uptake of library resources and services; and

10. Acceptance of ergonomics (better upholstery) and aesthetics (flowers, scenting, and attractive arrangement) as part and parcel of a good library experience.

The models discussed in this chapter cannot be all that exist. Similarly, due to space and time constraints, it was not possible to discuss them in greater detail. Nonetheless, the researcher hopes that this discussion is adequate to stimulate more dialogue on this topic and perhaps generate new and better models than those presented. The onus is on the professionals to harness the benefits of these discussions to develop new and/or update current models of library service which are consonant with the current civilization status and needs of the 21st Century generation of users.

Table 3.2 – Comparison of major library models

Source: Researcher

Feature	Traditional	Mobile	Community	Bookstore	Outpost	Embedded	Digital	Hybrid
Collection	Focus on ownership of general collection	Focus on less collection; just what is needed	Focus on ownership of localized collection	Focus on ownership of new collection	Focus on less collection; just what is needed	Focus on specialized collection; less ownership and more access	Focus on access and not ownership of diverse collection categories	Focus both on ownership and access collection development
Resources	Physical resources	Physical resources	Mixed physical and digital resources	Mixed physical and digital resources	Less physical and more digital resources	Less physical and more digital resources	Digital resources and no or negligible physical resources	Mix of both digital and physical; steadily moving towards more digital
Services	Traditional "acquire and lend"	Traditional "acquire and lend"	Traditional "acquire and lend"	Less traditional; including shared spaces.	Less traditional; users take shortest time in the library	Less traditional; services tailored to individual researcher needs	Non-conventional services mixed and remixed by the users and librarians	Mix of conventional and non-conventional
Mediation	Full mediation by librarians	Substantial mediation by librarians	Substantial mediation by librarians and the community	Less mediation by librarians	Less mediation by librarians	More self-service	Full self-service	Self-service and librarian-facilitated services exist side by side
Library place	"Sacred"	"No place"	"Sacred"	More Liberal	More Liberal	More Liberal	Virtual	Both virtual and physical

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CHAPTER FOUR – LIBRARY 2.0 MODEL

4.0 Introduction

Different people describe modern society in diverse ways. Obviously, every person has a view of the society depending on what s/he focuses on. Some describe the society as post-industrial or service society. Evidently, this view is informed by economic-historic perspectives. Others see it as the communication, information or knowledge society in which there is a great focus on information and communication management. Yet others are of the view that we currently live in a post-modern society characterized by greater ideals of freedom than before (Parker 1992; Cooper 2000). Regardless of their perceptions, many people agree that modern society is an interactive society characterized by a desire for participation that involves citizens, workers, customers, politicians, decision makers and entrepreneurs (Alsbjer 2008). Levine (2007) reports the discussions at the 2006 OCLC symposium[67] on rebranding libraries and explains that the "industry" needs to change because the society is also experiencing a transformation characterized by the following trends:

1. Convenience – people would like to get what they want with little effort. They abhor barriers and bureaucracies that delay or restrict their access to services and products;

2. Community – people enjoy their freedom to socialize with other people either virtually or physically. In the physical library, this can be facilitated by comfortable seating or serving beverages to the users. Online, this is achievable through social media tools like blogs, social bookmarking and discussion forums, among others;

3. Empowerment – people would like to be self-reliant. Already many of them are making their own travel reservations, stock trading, and home improvement. They would like to do the same in libraries as well;

4. Choice – people would like to choose the product or service that best suits their needs from a wide array of alternatives. They do not like to be restricted to a few options or no options at all; and

5. Experience – people yearn to be "wowed."[68] The experience of being in a good library is as important as the quality of the information resources therein. People long for a "wonderful place to read, write, think and reflect."

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[67] This symposium was held at Seattle in January 2006 on the topic "Extreme Makeover: Rebranding an Industry" (OCLC 2006).
[68] This term is used here to imply extreme satisfaction and pleasure.

Libraries, as part of the larger human society, inevitably have to change with it. Libraries have been changing and indeed, the history of libraries and librarianship is laden with myriad instances of change. For example, we have moved from handwritten manuscripts to low-cost industrial printing; from private or pay libraries to open and free libraries; from handwritten card catalogues to typed card catalogues, and now to electronic catalogues; from the library-based librarian to the embedded librarian within research units; and many more. Even though change has been a constant in the library history, it is now much faster and deeper than before giving rise to new expectations for better usability, efficiency, and faster response to user needs (Casey and Savastinuk 2007b). However, the change currently necessitated by the advancements in information and communication technology requires more consideration; especially on user participation. Library patrons do not want to use the library passively any more. For instance, they do not want to use the library only as a reading space or merely consuming the library services and utilizing the resources as provided without making any suggestions. Conversely, they want an experience that engages them. And, this is where Library 2.0 comes in.

Although a relatively new and controversial term, Library 2.0 is already well-engraved in the library lexicon (Cho 2008). It represents a new way of performing library services. There are differences in the understanding of what it is all about and whether it should be adopted. Discussion is still ongoing on various facets of the concept with no consensus in sight. This chapter presents some of these discussions.

4.1 Web 2.0

It is generally accepted that Web 2.0 provided the impetus for Library 2.0 (Casey and Savastinuk 2007b). It is logical, therefore, to explore the concept before focusing on Library 2.0. The term "Web 2.0" was coined by O'Reilly Media in 2004 to explain the way in which a new generation of web functions – file sharing, wikis[69] and blogs – differed from earlier web tools. Though original web developers like Vannevar Bush who developed Memex[70] in 1945 and Ted Nelson who pioneered the hypertext[71] concept in 1963 envisioned a more interactive web, latter developers

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[69] Wikis are online information resources and sites that allow users to add and edit content collectively.
[70] This is a concept of online library that enabled researchers to follow and annotate links which are of interest to them (Cerami 2003).
[71] Ted Nelson coined the term hypertext in 1963 to describe a new information management technology he conceptualized. His vision involved implementation of a "docuverse", where all data was stored once, there were no

focused more on advanced linear applications hence realizing only one facet of the technology. In this regard, the earlier web tools – now commonly described as Web 1.0 – were based on the restrictive one-way communication models where experts presented their material to an audience perceived to be expectantly captive. The concept of Web 2.0, on the other hand, espouses the idea that humans are each others' teachers; that knowledge originates from interactions such as meetings, conversation, dialogue and mentorship; and that even experts have something to learn from their audiences (Alsbjer 2008). To foster richer user participation, the World Wide Web (WWW) has undergone a transition and moved from being a mere collection of websites to a fully-fledged computing platform serving web applications to end users. This transition is what is described as Web 2.0 (O'Reilly 2005a; Miller 2006; Wikipedia Contributors 2009e; Maslov, Mikeal and Leggett 2009). Ultimately Web 2.0 services are expected to replace desktop computing applications for many functions using newer tools such as social networking sites, wikis, pervasive communication tools, and folksonomies that emphasize online collaboration and sharing among users (O'Reilly 2005a). Though the term suggests a new version of the web, it does not refer to an update of the Internet or WWW technical standards, but to changes in the ways they are used.

The emergence of Web 2.0 may have been necessitated by a number of factors including the need to replicate offline social networks on the Internet. Definitely, Web 2.0 makes the Internet more sociable and real. It is on this framework that social media tools such as MySpace[72], blogs and Facebook were developed. With the increasing ubiquity of the Internet, such social network sites are slowly becoming part and parcel of daily communication tools for many people worldwide. The tools are so popular that many people are now spending several hours daily interacting through them, even in the workplace. Consequently, many companies, especially in the private sector, currently use filters to block social media, especially MySpace and Facebook during working hours. There is ongoing debate whether these filters are justified or not. Those who support the filtering explain that companies lose valuable employee time through social media activities leading to low productivity and bandwidth congestion. On the other hand, there are people who are of the view that these tools can be used to leverage business and should not be shut out of the workplace. Besides, the latter school of thought asserts that blocking such sites is tantamount to infringing the

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deletions, and all information was accessible by a link from anywhere else (Stewart 1996). This is the concept now applied by social media tools such as Wikis.

[72] This is a social networking personal space on the Internet.

communication rights of the workers. The debate is still ongoing and its conclusion is not foreseeable in the near future (Humphries 2007; Partee 2007; Sinrod 2007).

Musser and O'Reilly (2007) identify the primary drivers of Web 2.0 as: 1) globalization and the need to reach to customers worldwide; 2) increased 24/7 connectivity making the Internet an essential part of the basic necessities of life for many people; 3) growth of the Internet accessibility locations enabling customers to remain connected everywhere they go and to expect services on the move; 4) deepening of digital interactions and transactions in which customers are now not just connected but engaged – contributing content and transacting business; and 5) transformation of the web to become a business facilitator enabling enterprises to reach more clients and generate more revenue.

According to Musser and O'Reilly (2007), Web 2.0 platforms and tools exhibit the following core characteristics:

1. It enables web users to do more than just retrieve information. This is the reason why it is also called the read-write web; it enables users to actively interact with the content as well as its creators. This is the foundation of user-generated content[73] and citizen journalism[74];

2. It enables users to execute applications straight from their browsers and they can own data on a Web 2.0 platform. They may also control the data;

3. Web 2.0 enables users to add value to the content they are accessing. This facility leads to a seamless exchange of information building a robust body of knowledge that is sometimes called collective intelligence;

4. It utilizes simple, user friendly and "lightweight" interfaces that do not require specialist knowledge to apply;

5. Web 2.0 systems are greatly decentralized with no centre of control or gates[75] as we know it under conventional media systems;

6. It is user-focused and invites their participation through seamless many-to-many communication mechanisms;

7. Web 2.0 is transparent and uses open technology standards that rapidly grow into open ecosystems of loosely coupled applications built on open data and reusable components; and

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[73] This is content which is contributed by the end-users as opposed to traditional media producers (Oien 2009).
[74] This is a new journalism concept in which members of the public play an active role in collecting, organizing and disseminating media content (Gillmor 2006).
[75] Control points that restrict information flow.

8. It is emergent and does not rely on fully predefined application structures. Web 2.0 structures and behaviours are allowed to emerge over time. This flexible, adaptive strategy permits appropriate solutions to evolve in response to real world usage and needs. It recognizes the fact that real success comes from cooperation and not control.

Andrew McAfee (2006), a Harvard Business School professor, explains that Web 2.0 systems generally have the following key features:

1. Search – a facility that enables users to seek information using keywords;
2. Links – references to information resources;
3. Authoring – facility to enable users to co-author resources;
4. Tags – continuous categorization of information resources which is flexible and not bound by pre-determined structures;
5. Extensions – using algorithms to automate work and pattern matching; and
6. Signals – a way of informing users of updates on resources of interest.

Common Web 2.0 tools include social networking utilities like MySpace and Facebook; electronic commerce solutions and sites facilitating complete real-time business transactions such as Amazon.com, eBay (online auctions) and online classified adverts on Craigslist; discovery sites like StumbleUpon[76]; enhanced search engines like Google; groupware such as Eventful for sharing calendars and diaries or social bookmarking for sharing bookmarks; and citizen journalism solutions such as YouTube (for sharing videos) and Flickr (for sharing photos) (Musser and O'Reilly 2007). The list is growing rapidly with the majority of the upcoming tools being open source.

In an effort to simplify Web 2.0, O'Reilly (2005b) proposed a meme map (*See Fig. 4.1*) which graphically illustrates the concept of Web 2.0. The orange rectangular part at the centre denotes the primary principles of Web 2.0. For instance, the web as a platform summarizes what Web 2.0 really is: a platform where users meet, discover information, remix and share knowledge. It is a platform where users create an experience using information from diverse sources. The green oval shapes at the top give examples of Web 2.0 tools. The brown oval shapes from the middle downwards highlight the characterization of Web 2.0 use. These include the environment in which its use is

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[76] StumbleUpon is a Web resource that enables users to discover and share websites based on set personal preferences. It is accessible on http://www.stumbleupon.com.

optimal (trust, play, hackability); the dynamic nature of Web 2.0 products (perpetual beta, software that gets better the more people use it, emergent user behaviour); the attitude with which the products are used (play, trust, right to remix); and the diverse categories of information resources available on Web 2.0 platforms (small pieces loosely joined). It also shows that Web 2.0 creates and sustains a rich user experience that engages the user as a creator and user simultaneously.

Fig. 4.1- The Web 2.0 meme map
Source: O'Reilly (2005b)

Web 2.0 demonstrates that monolithism[77] is no longer tenable or desirable. Instead, different users hold and contribute small pieces of information which are loosely joined to create a versatile collection through various mechanisms of user participation. Evidently, this approach works better in a decentralized architecture which harnesses the value of multiple sources (Coombs 2007; Hinchcliffe 2005).

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[77] This term is used here to refer to amassing of huge library collections to which access is highly restricted.

Miller (2005) asserts that leveraging the approaches typified by Web 2.0 offers libraries many opportunities to serve their existing audiences better, and to reach out beyond the walls and websites of the institution to reach potential beneficiaries where they happen to be, and in association with the task that they happen to be undertaking at that time. He summarizes it all by saying:

> With these approaches, we take our existing wealth of data, and we make it work much harder. We begin to break down the internal silos of the separate systems within a single library, and we connect those components to one another, and to related components and services far beyond the building. At a technical level, we make it possible for searchers to be presented with choices to view online, borrow locally, request from afar, buy or sell as appropriate to their needs and circumstance. Technically, it is possible, and we are doing it with standards and specifications shared across a range of sectors, rather than inventing our own library-specific standards once again (Miller 2005: Web 2.0 + Library = Library 2.0).

4.2 What is Library 2.0?

The term Library 2.0 was introduced by Michael Casey through his LibraryCrunch blog[78] launched in September 2005. In this blog, he expressed his views about the possible benefits of applying the then emerging Web 2.0 "to make libraries better" (Casey and Savastinuk 2007b). This suggestion was made in an effort to relate libraries to Web 2.0 just like it had been done for the Web 1.0 before it (Alsbjer 2008). Discussions about this new concept gained great momentum which was replicated in other blogs and websites and by October 2005 the term was introduced at *Internet Librarian 2005*[79] in a speech by Michael Stephen (Casey and Savastinuk 2007b) who used it to refer to the application of Web 2.0 tools to offer library services. Maness (2006) provides the commonly used definition of Library 2.0. He says that Library 2.0 is the application of the interactive, collaborative, and multi-media web-based technologies to library services and collections. Though Michael Casey is credited with coining the term, no one person can singly take the credit for the adopted definition or the wave of discussions that popularized it (Crawford 2006; Casey and Savastinuk 2007b; Cho 2008).

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[78] The blog is available online at http://www.librarycrunch.com.
[79] Conference for information professionals who are using, developing, and embracing Internet, Intranet, and Web-based strategies in their roles as information architects and navigators, Webmasters and Web managers, content evaluators and developers, taxonomists, searchers, community builders, information providers, trainers, guides, and more held at Monterey, CA – October 24-26, 2005. More information on the conference can be obtained from http://www.internet-librarian.com/2005/.

Farkas (2007) admits that defining the Library 2.0 concept is a difficult task. She explains that if you ask any five people what Library 2.0 is you will most likely get five different answers. She adds that the definition thus obtained will depend on the respondent's perspective and context. For instance, some people would define Library 2.0 as being primarily about technology – being available at the point of need, providing library services online where the users are, creating more interactive library systems that capitalize on the collective intelligence, and developing more usable library systems. Other people would focus more on service orientation than technology – user-centred services, surveying users, constantly re-evaluating library collections and services, meeting the needs of the long-tail; and the list continues. Many other scholars also support this view and admit that the end of the debate on the real meaning of Library 2.0 is not in sight (Miller 2005; Crawford 2006; Casey and Savastinuk 2007b; Maness 2006; Deschamps 2008; Farkas 2008; Gibbons 2009).

Iser (2006) defines Library 2.0 as the expression that captures the practical and focused efforts to use web technologies – Web 2.0 in particular – to connect to and create relationships with library patrons. She emphasizes that these new technologies enable library community members to interact and share information, more so with peers. In her view, librarians use Library 2.0 to bring libraries closest to the people through information-driven social media. She alludes to the notion that Library 2.0 is a second phase in library development which, according to her, is better, for instance, in terms of facilitating seamless users-to-users and users-to-librarians interaction than the previous phase. She emphasizes that Library 2.0 seeks to connect patrons to the library and to each other through diverse technologies determined by what the patrons currently use. The focus of Library 2.0, to her, is robust connectedness between all the members of the library community for mutual benefit.

According to Farkas (2005), the idea of Library 2.0 represents a significant paradigm shift in the way people view library services. It describes a seamless user experience, where usability, interoperability, and flexibility of library systems are vital. She adds that it is about the library being more present in the community through programming, community building (both online and physical), and outreach via new communication technology tools such as IM, screencasting, blogs, and wikis, to mention but a few. She also explains that Library 2.0 is really about allowing user participation through writing reviews and tagging in the catalogue and making their voices heard through blogs and wikis. She also underscores the effort by the Library 2.0 approach to make the library human, ubiquitous, and user-centred. To achieve these, she concludes that it requires a change in library systems, web presence,

and librarians' attitudes. She admits that it will take a lot of work and time for any library to be completely 2.0, but insists that the idea should inform every new decision made at the library today.

Cho (2008) also asserts that Library 2.0 is a transition within the library world in which programmes and services are delivered to the users through new and innovative methods. He adds that the principles of Library 2.0 are "entirely" user-centred and that they facilitate seamless collaboration between the users themselves to create community content using new communication technologies. He is supported by Sanzo (2008) who also emphasizes that Library 2.0 is a new model of service in libraries that embraces change and technology and engages users to create a customer-driven library. He (Sanzo 2008) also explains that Library 2.0 looks at how library services fit into the new user-centric world created by Web 2.0 technologies where dynamic web-based tools, online communities, and the ability to customize and personalize everything, drives people's computing environment.

Habib (2006), however, is of the view that Library 2.0 brings together two discrete concepts – library and 2.0. He suggests that defining the concept merely as an integration of the two concepts is limiting in the sense that it assumes that both concepts are transferred as they were during the integration. Conversely, he suggests that a true definition of the term should take consideration of the fact that when these two concepts merge they create a totally new and different concept which blends several features of either of them. To illustrate this view, let us consider cocktail juice made from mango and orange juices. While the cocktail may have orange and mango flavours, these flavours do not exist independently of each other. They are blended harmoniously to create a new juice with a totally new colour, taste and texture. Similarly, Library 2.0 is neither Web 2.0 nor is it a common library service. Library 2.0, therefore, cannot be defined by the separate characteristics of the two composing concepts but by new features arising from the resulting union between the two. Habib (2006), therefore, proposes that Library 2.0 should be defined as a subset of library services designed to meet user needs precipitated by the direct and peripheral effects of Web 2.0. He explains that this definition demonstrates that Web 2.0 catalyzes changing user needs and that Library 2.0 services have emerged to meet these needs. This view seems to contradict the common understanding that libraries have been changing throughout history even before Web 2.0. However, Maness (2006) explains that Library 2.0 actually recognizes the changes libraries have undergone over the years but adds that the use of this term, at least for now, is specific and tied to Web 2.0. In

fact, he suggests that the previous and impending changes in libraries can be described by other terms accordingly. They do not have to be "squeezed into" Library 2.0.

Evidently, the label and meaning of Library 2.0 as a concept remain debatable (Miller 2006; Rothman 2006; Casey and Savastinuk 2007b). It is a mushy term (Plutchak, 2006), an amalgam of ideas (Blyberg 2006) and so, there are many contrasting and seemingly contradicting views about what it really ought or ought not to be (Crawford 2006). But there are three overarching views: (1) It is the representation of transformational change of existing library models making it revolutionary; (2) It is the continued improvement and extension of existing library services to meet the constantly changing user needs making it evolutionary (Crawford 2006); and (3) It is neither revolutionary nor evolutionary since its main features, such as user-centeredness, have been hallmarks of librarianship for ages (Solomon 2006). However, most Library 2.0 concepts are constructive; building on today's best practices and improving them for the future (Crawford 2006). In spite of the contestations, the term continues to be an acceptable label for the new change – whether revolutionary, evolutionary or not – in library services (Miller 2005). It is an attempt to focus energies on two specific objectives: 1) empowering the user; and 2) embracing constant change (Casey and Savastinuk 2007b).

Apart from the debate around its real meaning, Library 2.0 has also provoked fresh controversies. For instance, Crawford (2006) draws a distinction between what he calls Library 2.0 and "Library 2.0". He explains that while the former is the new model seeking to improve current library services, the latter is a confrontational bandwagon movement deriding today's libraries and librarians as rigid and unchanging. He avers that "Library 2.0" is unfortunate and adds no value to the existing concepts but detracts and creates division where none is necessary. Other controversies revolve around the role of technology in Library 2.0 as well as whether or not it can be adopted by all types of libraries and how it should be implemented (Chad and Miller 2005; Miller 2006). Some librarians also suggest that Library 2.0 advocates have misplaced priorities and are unfairly dismissive of those who don't agree with them (Cohen 2007a).

There is a consensus, however, that the heart of Library 2.0 is user-centred change (Albanese 2004; Abram 2006; Blyberg 2006; Cohen 2006a; Miller 2006; Rothman 2006; Walter 2006) which is not only constant (Albanese 2004; Abram 2006; Blyberg 2006; Cohen 2006a; Crawford 2006; Miller 2006), but also inviting user participation in the creation of both the physical and the virtual services

they want (Miller, 2006), supported by consistent evaluation of the services. It is also an attempt to reach new users while offering better services to the current ones through improved customer-driven packages. Each component by itself is a step toward better user service (Crawford, 2006). However, it is through the combined implementation of all of these that Library 2.0 can be attained (Chad and Miller 2005; Casey 2007).

Despite the change represented by Library 2.0 fitting so well with the history of libraries and their mission, it is still a major paradigmatic shift from the traditional model. One of the areas Library 2.0 model seeks to change is access and control of systems such as catalogues. Whilst it is relatively easy for librarians to provide open access to the catalogues and collections, it is difficult for them to cede their control to the actual and potential users (Blyberg 2006). Library 2.0 recommends that libraries focus less on secured inventory systems which are selected and managed largely by the librarians and more on collaborative discovery systems which are designed or selected and managed constantly by both librarians and users in a mutually-beneficial partnership (Miller 2006). These systems are dynamic and are regularly changed by the librarians and users. There is perhaps a great synchronicity between librarianship and Web 2.0, but viewed holistically, Library 2.0 will change the profession. Ideally, rather than creating systems and services for patrons, it will enable users to create tools and solutions for themselves. Consequently, the traditional librarianship profession which is steeped in decades of a culture of control and predictability will need to continue moving toward embracing facilitation and ambiguity. This shift corresponds to similar changes in library history, including the opening of book stacks and the inclusion of fiction and paperbacks in the early 20th century (Maness, 2006). These shifts, however, have limits and may only be executed selectively and in varying extents in different library ecologies (Crawford 2006).

Cho (2008) asserts that Library 2.0 ultimately relies on the skilful use of emergent technologies to serve library patrons. He suggests that the Web 2.0 technologies that librarians could use to offer services to the users include:
1. Instant messaging (IM);
2. Video sharing (like YouTube);
3. Podcasting;

4. Photo sharing (such as Flickr[80]);

5. Blogs and wikis;

6. Social networks (such as MySpace, Facebook);

7. Folksonomies and social tagging;

8. RSS[81] feeds; and

9. Web mash-ups.

In conclusion, therefore, it is evident from the foregoing that Library 2.0 describes a subset of library services designed to meet user needs precipitated by the direct and peripheral effects of Web 2.0 (Crawford 2006; Habib 2006; Casey 2007; Maslov, Mikeal and Leggett 2009). It is a way of thinking and a way of operating (Casey 2007). It is not just about searching, but finding; not about mere access, but sharing (Albanese 2004; Maness 2006). In the words of Walter (2006), Library 2.0 is a commitment to assess, improve, integrate and communicate library services using the newest information technology and the tried and true "human technology". It is any service, physical or virtual, that successfully reaches users, is evaluated frequently, and makes use of customer input (Casey and Savastinuk 2007a). While Library 2.0 is still an evolving concept, it nonetheless is a necessary development that encourages both users and libraries to reposition themselves – in terms of redefining their expectations and obligations – and their ideas about how a library functions. It ultimately helps libraries to grow and develop as a significant cultural institution in the society (Cho 2008).

Thus, Library 2.0 can be defined as the new model of library service which harnesses the power of emerging information and communication technologies to create a dynamic physical and/or virtual library platform which is defined and controlled by the users and librarians and which facilitates the delivery of a superior library experience to the users anytime anywhere anyhow.

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[80] Flickr is a photo sharing website. It provides a means for Web users to share personal photographs with each other and is mainly used by bloggers. It was developed and launched by Ludicorp, a Canadian company, in 2004. More information on Flickr can be obtained from http://www.flickr.com/.

[81] RSS stands for Really Simple Syndication or Rich Site Summary. It is a format for sharing Web content among different websites. It is a system that scans and aggregates contents of blogs and other tools that are updated regularly and delivers the same to registered users (Fagan Finder 2004).

4.3 Principles of Library 2.0

Various library and information scholars have proposed more than ten principles of the 2.0 librarianship. Whilst a number of them have caused controversy, the following four have been accepted by the majority as critical to guiding the Library 2.0 discourses and practice:

1. *The library is everywhere:* A number of scholars aver that the Library 2.0 model facilitates the provision of services at the point of need. Library 2.0 libraries and their services are visible on a wide range of devices, and integrated with services from beyond the library such as portals, virtual learning environments as well as e-commerce applications (Chad and Miller 2005; Stephens 2005; Casey 2007). With Library 2.0, libraries move beyond the notion of "library without walls" in which traditional libraries offered destination websites where physical library services were digitally reproduced (Miller 2006). Instead, relevant aspects of that library experience are reproduced wherever and whenever the user requires them. Crawford (2006), however, argues that libraries have never been primary information sources for all people. He asserts that a library that attempts to be all things to all people, to serve all information needs under all circumstances, is a library that will fail: its people and other resources will be stretched too thin to do anything well.

2. *The library has no barriers:* Library 2.0 also ensures that information resources managed by the library are readily available and that barriers to use them are minimized (Chad and Miller 2005; Stephens 2007). In the Library 2.0 model there is an active presumption that use and re-use of resources is both permitted and actively encouraged (Chad and Miller 2005; Miller 2005). With many governments adopting Freedom of Information policies, expectations of users' rights to access information held by libraries have drastically risen. Library 2.0 is about working with these users and other library stakeholders to enhance the availability of information. Modern librarians must constantly work to reduce barriers to their services and libraries (Stephens 2005).

3. *The library invites participation:* Library 2.0 invites and facilitates the culture of participation, drawing on the perspectives and contributions of staff, technology partners and the wider user community (Miller 2006). This concept is exemplified in wikis, blogs, RSS and social bookmarking systems facilitated by Web 2.0 technologies, as discussed earlier (Chad and Miller 2005; Miller 2005; King 2007a; Stephens 2007). Cho (2008) clarifies further that Library 2.0 does not only encourage user participation and feedback in the development and maintenance of library services, it is supposed to be continually evaluated and

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updated by the users and librarians to meet the changing needs of library users. He also adds that the active and empowered library user is a significant component of Library 2.0. With information and ideas flowing in both directions – from the library to the user and from the user to the library – library services under Library 2.0 model have the ability to evolve and improve on a constant and rapid basis. Thus, the user becomes an active participant, co-creator, builder and consultant of the library services and products.

4. *Library 2.0 uses flexible best of breed systems*: This model requires a new relationship between libraries and a wide range of partners in which all parties together push the limits of what is possible whilst ensuring that core services continue to operate reliably (Chad and Miller 2005; Crawford 2006). Library 2.0 challenges the conventional procurement procedures in which detailed specifications of tendered services and products are given to the vendors. Instead, components are innovatively mixed. Librarians rely on the expertise and expectations of their users and other stakeholders to identify, acquire and install suitable systems to effectively deliver their services. There are scholars, however, who hold the view that too much flexibility opens up libraries for undue influence by the vendors of services and products. They argue that this is not only disruptive; it also gives too much control of determinants of library success such as library management systems and technological utilities to third parties that may not be interested in the welfare of libraries but in profits (Crawford 2006; Blyberg 2008).

In summarizing these principles, Cho (2008) explains that 2.0 model libraries should exhibit unique characteristics which distinctly set them apart from the ordinary libraries. These include:

1. The 2.0 libraries embrace their communities and change along with them;
2. The libraries embrace user-centred content and services which maximize the library's online web presence;
3. The roles of the 2.0 librarian and user (Patron 2.0) are not always clear and are ever-changing;
4. The 2.0 libraries create a multi-media experience in which collections and services consist of both video and audio components; and
5. 2.0 libraries are socially rich and possess a robust web presence which encourages a two-way communication environment between the users and libraries.

4.4 Library 2.0 meme map

The Library 2.0 meme map (*See Fig. 4.2*) was developed by Bonaria Biancu, a librarian at the University of Milano-Bicocca, Italy, in 2005. The meme map seeks to aid the understanding of the concept of Library 2.0. No detailed explanation of the meme map was found in the literature reviewed by the researcher. However, the researcher noted that the meme map may have been derived from the Web 2.0 meme map, discussed in earlier sections of this chapter. The researcher proposes the following explanation of the meme map.

Fig. 4.2 - Library 2.0 meme map
Source: Biancu (2006)

The central part presents the foundations of Library 2.0 as a model. From this meme map, it is evident that Library 2.0 is about creating a service environment and tools that facilitate effective service design and delivery to library patrons wherever they are at anytime using modern information and communication technologies. The meme map also underscores the fact that Library 2.0 is participatory and involves many players such as library patrons, communities, sponsors, librarians, and application developers working together seamlessly to deliver user-centric library experience and services. Library 2.0 is also about recognizing and managing change that constantly

confronts the library ecosystem. The use of open standards, however, may hinder access to resources and bibliographic control.

The branches of the meme map represent conditions and principles that would facilitate the creation and sustenance of an effective Library 2.0 environment. For instance, it identifies the key features of a Library 2.0 institution as a library that fits (adaptive), learns (does not know everything and can be "taught" by the users), suggests (cedes some authority to the users), gathers (does not amass), combines (mixes and remixes content and experiences) and organizes resources and services to meet dynamic user needs. Critically, it also shows that a 2.0 library is organic; meaning that it is sensitive, it recognizes its weaknesses and seeks help, and constantly changes. If it is not nurtured, it can die. A 2.0 library also lets implying that it empowers and lets the users serve themselves thus reducing the levels of intermediation. It may also imply that it gives more freedoms to the users and minimizes barriers to the access and use of its services. It is also important to note that 2.0 library users (Patron 2.0) are no ordinary users. They exhibit new and versatile needs of which the key features include self-service and anywhere-anytime service. The other branches suggest ways of implementing Library 2.0 including establishment of committees, enhancing OPACs, creation of "loud" sections in the library where people can chat, and delivery of portable library services through mobile devices.

4.5 Library 2.0 cookbook

This was developed by Karen Schneider in 2006 to explain the progression of Library 2.0 from 1.0.

	L 1.0		**L 2.0**
Closed stacks	-->	Open stacks
Collection development	-->	Library suggestion box
Preorganized ILS	-->	User tagging
Walk-in services	-->	Globally available services
"Read-only" catalogue	-->	Amazon-style comments
Print newsletter mailed out	-->	Team-built blog
Easy = dumb users	-->	Easy = smart users
Limited service options	-->	Broad range of options
Information as commodity	-->	Information as conversation

Monolithic applications	-->	Flexible, adaptive modules
Mission focus is output	-->	Mission focus is outcome
Focus on bringing 'em in	-->	Focus on finding the user
ILS is core operation	-->	User services are core

Fig. 4.3 - Library 2.0 cookbook
Source: Schneider (2006)

Though simplistic, Schneider (2006) expounds on the nature of the new library users in this cookbook (Patron 2.0). She explains that these are users who prefer mobile technologies, are always connected, multitask, expect fast delivery of services, self-serve, embrace high transparency through social networking applications and games, and use less traditional mass media such as television.

4.6 Library 1.0 versus 2.0

Library 2.0 presupposes Library 1.0. Indeed many people view anything before 2.0 as 1.0. However, the 1.0 term has become increasingly associated with the traditional classical libraries (Chad and Miller 2005). Whilst most proponents (evangelists) of the Library 2.0 model view it as a progression on Library 1.0 (Stephens 2005; Rothman 2006) making it better (Miller 2006; Solomon 2006), supporters of 1.0, on the other hand, have no kind words for 2.0. Gray (2006) sees no real new value in 2.0 that 1.0 could not offer. While admitting that there are several areas that need improvement in 1.0, he does not regard technology as the panacea to these inadequacies. He is supported by Deschamps (2008) who posits that merely having blogs and other social outreach utilities in the 2.0 model will not help much if there are active policy and other barriers preventing people from using the library effectively. He suggests that it is easier and faster to improve 1.0 than deploy a totally new 2.0 which requires elaborate strategies and longer planning cycles to implement. He further argues that it is communication with patrons that matters and not the mere use of blogs. He concludes that a library can launch many blogs, flickr accounts and other tools and not really accomplish anything when it comes to customer service. He recommends that libraries should identify their needs first and then select the technologies or solutions that would help meet those needs (Deschamps 2008). Blyberg (2008) agrees with Gray (2006) and Deschamps (2008). He warns that it is easy to become enamoured by social networking sites and Web 2.0 "toys" to the point where they seem like a panacea for everything wrong with your library or your job. He further argues that it is not realistic to blindly prescribe tools such as wikis and hope that they will work some magic in isolation. He

points out that the reality that many 2.0 "evangelists" ignore that which the most successful users of these newest technology tools have recognized, is that they are just that - tools (Sheehan 2008).

But Rothman (2006) sees no reason for the controversy between 2.0 and 1.0 concept. He disagrees that calling the new model 2.0 does not necessarily place it in opposition with the old model which then must be perceived to have been anti-users. He emphasizes that the new model provides a method to actively invite and facilitate customer input so as to facilitate a stronger, clearer, more consistent conversation with the library patrons. He adds that embracing the new model does not imply that the old model was bad but that the former can facilitate better services than libraries have managed to offer to their clients, especially in light of the changes in the infosphere. He also admits that though libraries have always embraced change, there are a number of practices embedded in the traditional model that hinder the same. He identifies one of the greatest impediments to meaningful change as lip-service. He asks rhetorically, "if people are going to get bent out of shape every time someone says "we should be better," how will any progress ever be made?" Rothman (2006) is supported by Levine (2006) who sees Library 2.0 as a mash up of 1.0 with new concepts and castigates those opposing the model as being linear in thought by implying that if something is not "A" then it is "B".

Some scholars and practitioners are also of the view that Library 2.0 is not really about change. They describe it as a hollow concept co-opted by a growing group of libraries, librarians, and particularly vendors to push an agenda of "change" that deflects attention from some very real issues and concerns without really changing anything. They also point out that even when this change actually happens, it is disruptive and ignores the delicate information ecologies of libraries and their communities. This disruption is witnessed in and affects costs, staffing, control and authority in library ecosystems (Blyberg 2008; Mercado 2008).

The role of vendors in hyping the 2.0 model has also been criticized. Many scholars believe that the vendors are driven by the desire for huge market shares and profits, and obviously do not have an honest interest in libraries (Crawford 2006; Blyberg 2008). They argue that one cannot really buy 2.0. This implies that vendors need to realize that they cannot sell it and their hope that the real life situation will at some point mimic the virtual hype is misplaced.

Laying the foundation of Library 2.0 on Web 2.0 is also viewed as a fallacy (Farkas 2005). This is because Web 2.0 is largely considered as a technological concept while Library 2.0 is a service seeking to extend the reach of and experience in libraries. Besides, the latter did not develop with the former in mind (Blyberg 2008) and, perhaps, it never will. Others also argue that Web 2.0 is a technological hype which will fade away. Libraries, on the other hand, are not momentary (Farkas 2005). Consequently, those contesting the founding of Library 2.0 on Web 2.0 assert that it is very unfortunate that libraries are currently too consumed with technology while ignoring serious matters that they should urgently address (Mercado 2008). One of those serious matters is managing technological change, as he asserts below:

> Web 2.0 is such that by the time most libraries, already behind the curve on technology and are understaffed, get around to implementing something new, a large chunk of the 2.0 community has already moved on to the next hot thing (Mercado 2008: Comments).

Whether Library 2.0 is better than 1.0 or not cannot be assumed since it is still contestable (Levine 2006; Plutchak 2006; Rothman 2006). Levine (2006) sees no logic in directly contrasting the two models and argues that defining something as new does not necessarily make it diametrically opposed to or better than the old. For her, it is a continuum with revolutions and evolutions but not opposition or denigration of 1.0. Nonetheless, there is discernible resistance to Library 2.0 on many fronts which could be attributed to many factors including:

a) Librarians think that they know more than the users. It is their considered opinion that users should depend on their (librarians') expertise and experience to seek, locate, access and use information (Crawford 2006). They fail to discern the relationships between themselves and the information; themselves and the users; and users and the information in libraries. There is need for the triad to be harmonized in a synergized bond to bring out the best of each entity for the greater good of the whole infosphere (Smith 1990).

b) Librarians also think that the library patrons should continue to utilize the tested information searching techniques such as the Boolean system (Cohen 2006a). This requires the users to understand the library bibliographic apparatus such as catalogues, indexes and bibliographies. Furthermore, in working their way through these apparatus, they must also be willing to move back and forth through immense perseverance and effort (Smith 1990).

c) Librarians encourage users not to search for themselves because they believe the users will not get the information they need. Again, reliance on the librarians to search for information is encouraged (Crawford 2006). This view is premised on the fact that to retrieve information effectively, one needs more than just the technical searching skills. For instance, they need to understand the library processes encompassing varied issues such as cataloguing policy, circulation regulations and interlibrary loan procedures. As Smith (1990) asserts, information searches of this kind are arduous, complex and time consuming and are frequently frustrating and seldom satisfying. Of course, technology supported searches are much simpler and faster and do not require as much expertise as their conventional counterparts. They are more deskilled and can be conducted effectively by users themselves with little or no assistance from the librarian. With the emergence of more techno-based searching utilities, such as FOIOTI[82] pioneered by Melius Weideman, information searching is bound to be even simpler and more rewarding.

d) Librarians want to classify as much information as possible (Miller 2006) to facilitate easier search and retrieval. In this pursuit, several techniques and tools have been used and discarded over time. One of the major contentions has been whether or not to use natural or controlled language. The Cranfield tests,[83] however, proved that the use of either of the approaches to subject indexing does not significantly impact the information retrieval performance (Cleverdon 1991; Salmela 2006). Consequently, both approaches are applied in varying degrees by different libraries and librarians. In this pursuit, the librarians have been guided by two objectives: completeness and control. They have attempted to gather as much collection as possible and organized it into structures to make it adequately identifiable and positioned (Smith 1990). But users, on the other hand, prefer to collaboratively classify information by themselves through social systems such as folksonomies as they emerge (Barnes 2007; Magnuson 2009). This latter view is informed by the understanding that information creation and sharing is dynamic and exhibits rapid growth that cannot easily be captured and classified by the traditional librarianship techniques. Furthermore, there are many instances in which users have a better understanding of the structure of knowledge in

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[82] This is an Internet information searching aid. More information on the tool can be obtained from http://www.mwe.co.za/htm/internet-searching-foioti.htm
[83] Tests conducted in the late 1950s and early 1960s at Cranfield College of Aeronautics by Cyril Cleverdon and others to investigate the link between indexing languages and the performance of information retrieval systems (Salmela 2006).

their areas of specialization than librarians.[84] There are divergent views on whether such user-generated "classification schemes" are more effective in aiding information searching and retrieval. Perhaps, this is an indication that though such new approaches to information classification may be innovative there are obvious limits to their usefulness.

e) Librarians and libraries operate in relatively bureaucratic systems which allow limited adventure. Consequently, they can only adopt new systems gradually. This is positive in certain respects. For instance, it 1) ensures that libraries do not adopt changes just for the sake of it; 2) creates room for consultation of the other players in the system and facilitates participatory approaches to change; and 3) gives time for preparation and organization of resources to implement and manage the desired or inevitable change more effectively (Smith 1990). On the other hand, this relatively cautious approach to change may be unsuitable for ICT because the users get more easily excited, anxious and ready to espouse new tools and techniques as soon as they know of them (Cohen 2006a). Evidently, libraries and librarians have always changed but to remain in tandem with the constantly changing user needs and tools, the pace of that change should be much faster than it has been in the past (Casey and Savastinuk 2007b).

4.7 Library 2.0 and technology

The linkage between technology and Library 2.0 is a tricky one. Proponents of the model are at pains to explain that though technology plays a major role in defining and facilitating Library 2.0, technology alone does not constitute a library (Blyberg 2006; Miller 2006; Casey and Savastinuk 2007b; Stephens 2007). Consequently, in their view, Library 2.0 cannot just be about technology (Casey 2007; Casey and Savastinuk 2007a) because libraries need much more than just that (Crawford 2006). They argue that Library 2.0 is about new service design and delivery models and technology is a mere tool of its implementation; and it is not the only tool either (Miller 2006; Casey and Savastinuk 2007b). On the other hand, some scholars are not convinced that technology merely plays a peripheral role in Library 2.0 as its proponents would like people to believe. They point out that the solutions proposed by Library 2.0 are mostly technology based. Furthermore, in their view, only technology is conspicuously visible in most Library 2.0 considerations (Casey and Savastinuk 2007b; Chabot 2007). They reason that if Library 2.0 is really not about technology then it is just

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[84] This view was confirmed by the preliminary interviews with librarians at the case libraries conducted between 14 and 18 April 2008.

ordinary librarianship. If what is left of the concept is user-centrism, change and evolution, then librarians who do not do these things already are bad librarians. Good librarians have always been user-centric (Chabot 2007).

The clarification notwithstanding, there are opinions that librarians in seeking to satisfy and keep their users are in a mad rush to embrace anything that promises change and have been baited by the technological fad. Surprisingly, this technological rush is not new to the profession. For instance, Buchanan (2009) in her study of the history of University of Natal libraries chronicles instances of quick implementation of computerized library systems at the university and explains that due to lack of in-depth analysis and understanding of some of the projects vis-à-vis the needs of the library users, some of the systems stalled mid-way. Some librarians are often in a hurry to provide technological solutions to library situations before even understanding the real problem (Casey and Savastinuk 2007a; Chabot 2007; Buchanan 2009). Chabot (2007) and Klein (2007) further argue that these technological solutions, as suggested in the Library 2.0 model, are actually librarian-centric and not users-centric. Chabot (2007) adds that giving people technology is an excuse used by librarians to ignore the need to listen more to their users by giving them what they want and not what they really need. He concludes by saying:

> I am for all the things that people suggest for Library 2.0 solutions, save a very small number. However, if we think that these stop-gap solutions are worthy of a 1.0–>2.0 revolution, we have to look at the studies around us and see what our users *really* need (Chabot 2007: Last paragraph).

Another issue that is evident in the literature on Library 2.0 and technology is usability. Opponents of the model, as currently proposed, feel that if a huge proportion of library patrons were not able to effectively use the relatively simple 1.0 technology, then how are they expected to use the more sophisticated 2.0 technology? They also wonder what will happen to the poor and/or disabled who are unable to afford or effectively use these tools? Are their needs taken care of by the Library 2.0 propositions (Plutchak 2006)? Proponents assert that these issues are taken care of just like in the 1.0 model where there were large print books, Braille story books, and story hour to respond to the needs of persons with disability (Levine 2006). Open source solutions, for instance, are aimed at making technology available to the masses affordably.

The higher focus on technology in the Library 2.0 discussions may be attributed to (1) the emergence of many new technologies of potential value to libraries and users as contrasted with fewer new physical services; (2) a better understanding of how to serve the users that come into library buildings, less so with users of online sites/resources; and (3) possibilities of testing or implementing Library 2.0 technology for little or no cost. In that context, it makes sense that most of the talk would centre on technology (Levine, 2006).

While the debate is still on, Casey (2007) makes the following statement which, for the time being, is construed to give a better picture of the relationship between Library 2.0 and technology:

> Library 2.0 is not about technology. Library 2.0 seeks to harvest good ideas from outside and use them to deliver improved and new services, often times in an effort to reach a new target population. Library 2.0 is, at its core, a way of thinking, a way of operating. It's a framework for integrating change into all levels of library operations. It's in our effort to reach this new level of service that we will utilize these new Web 2.0 technologies (Casey 2007: What is Library 2.0?)

Indeed, Casey and Savastinuk (2007b) also add that the changes that libraries need to make to keep up with the dynamic needs and wants of their users involve much more than just technology. It involves a paradigm shift in which librarians cease to ask what they can do for the library users and begin to ask what they can facilitate the users to do for themselves.

4.8 Implementing Library 2.0

Little is written on Library 2.0 implementation. Casey and Savastinuk (2007b) suggest that each library should map its own unique route to Library 2.0. They add that how Library 2.0 works within an organization varies a great deal based on that library's community and organization structure. They also suggest that before taking the leap, the library's community should first seek to understand where their library is; how it is currently serving its users; where they (the community) would like it to be; and how Library 2.0 can take it there. Clearly, this is a participatory process in which all the stakeholders are involved in evaluating the prevailing scenario and mapping an appropriate way forward through various shades of collaboration and consensus building mechanisms (Stephens and Casey 2005) and is aimed at meeting changing customer needs, staying relevant culturally, and keeping the library's digital space up-to-date (King 2007b).

David Lee King (2007b) also suggests that before a library moves to a 2.0 platform it should ask itself the following questions:

1. Why set up the new services? It is important to justify the change and demonstrate the benefits which the new services will accrue to the library, the parent institution and the community at large. New services should not just be introduced for the sake of it or just because other libraries have done likewise. Every new service designed and commissioned should add value to the library and its patrons.

2. What new services to set up? There are many options. The library management should be aware of the existing options, their advantages and disadvantages as well their suitability for the specific library context. The possible options should be weighed against the library's vision and mission and the most suitable service(s) chosen. It may also be prudent to expand the options horizon to include systems that could possibly be developed in-house. This is especially desirable for libraries that have very unique needs and adequate staffing.

3. Who will do what part? The 2.0 environment requires the participation of both the library staff and patrons. It is important that each party understands what their role would be. They should also be empowered to perform the assigned roles adequately.

4. How to make it happen? The library management should develop an elaborate plan on how to make the 2.0 dream a reality. This may include acquisition of equipment and systems, skilled staff members, as well as development of new procedures and institutional frameworks to support the new model.

5. When should it be rolled out? Some new 2.0 tools like blogs take just a few minutes to develop and launch. The big question here is: when would it be appropriate to do what? To add value, the new systems should not be introduced hurriedly but gradually.

Murphy (2008) argues that a library needs a suitable game plan to make the 2.0 switch successfully. He explains that this game plan should consider the establishment of standards; staffing; policies; user involvement and expectations; user and staff training; costing; marketing and promotion; and monitoring and evaluation. Cohen (2007b), on her part, outlines an action plan for transforming a traditional (1.0) library into a 2.0 model in which she also proposes prior adequate understanding of the concept by the library stakeholders before attempting to implement it. She argues that this prior understanding enables the library stakeholders to appreciate how the provisions of the new model are different from their current one. It also helps them to see how their users are likely to benefit

from it and whether it is addressing any of the challenges they are currently facing. The process also enables the libraries to understand the levels of investment needed to facilitate this transformation. Once this is done, she recommends the following steps:

1. Formal assessment of the library as a whole to identify the areas which need to change. Users, staff as well as other members of the library community should be involved in this process so as to make it participatory;

2. Work with all stakeholders to identify areas where new Library 2.0 tools can be used to make the services better; and

3. Selectively introduce the tools in a systematic manner ensuring user/staff participation and induction at all stages of the process. If needs be, staff training may be undertaken or new staff recruited to ensure that there are adequate human resources to implement the project.

Other scholars (Rivera *et al.* 2006; Helling 2007; King 2007b) highly recommend the creation and use of committees to facilitate the transformation. They argue that this is a much easier and faster strategy than trying to achieve the same with all stakeholders at the same time. Helling (2007) also explains that there are some Library 2.0 tools which are available free while some may have to be bought. The availability of free, or low-cost, application software offers a means of testing ideas and may be a cost effective way for expertise in use of Library 2.0 technologies to be gained. In short, the library needs to scout for all alternatives before selecting the best options.

Schneider (2006) also suggests that a library needs to do the following to successfully launch a 2.0 library:

1. Identify and prioritize just a few new services the library should introduce to deliver differently;

2. Develop an appropriate action plan and procedure of how to accomplish these;

3. Accomplish the identified tasks one at a time; and

4. Monitor the successes and/or failures of the projects continuously.

Transforming a library from its original service framework, especially if it is the traditional model, is bound to face various challenges. Helling (2007) identifies some of the challenges most libraries are likely to face when implementing the 2.0 model as:

1. Staff turnover which may disrupt the programme especially if any members of the core Library 2.0 team are involved;

2. Use of Library 2.0 tools which are inappropriate for the context of the adopting library;

3. Resistance to the proposed or implemented elements of change by various members of the library community;

4. Technological challenges such as the need for updates and licensing; and

5. Some of the core services or tools may be outside the direct control of the implementing libraries.

In such cases Helling (2007) proposes the following best practices in implementing Library 2.0:

1. Constant training and re-training of staff to boost the competence pool;

2. Preparation of adequate budgets for Library 2.0 model tools as well as the staff to handle them;

3. Reduction of the level of third party Library 2.0 service dependencies, for instance, by building the capacity of staff members to improve or support the third-party tools in-house;

4. Flexible budgeting to cater for any contingencies during implementation; and

5. Establishment of the services the clients really want so as to minimize resistance.

Brown (2009) also recommends that it is prudent to introduce the changes when the patrons are in the right state of mind to receive them. This may require preparing the users adequately to understand the new model. The preparation may take the form of training, open discussions on the model, harnessing the users' expectations and fears regarding the model, adopting a Library 2.0 model, and building the capacity of the librarians to support the new model and explain it effectively to the users (West 2005).

On her part, Wright (2007) gives the "ten commandments" for effective Library 2.0 implementation as:

1. Listen to your staff;

2. Involve staff in planning;

3. Tell stories – demonstrate why and how;

4. Be transparent;

5. Report and debrief;

6. Do your research;

7. Manage projects efficiently and effectively;

8. Formally convene the Emerging Technology Group;

9. Training 2.0: Let everyone play and experience; and

10. Celebrate success.

It is evident from the foregoing that implementing Library 2.0 is a complex process and can be varied depending on the context of the implementing library. However, the best practices that can be derived from the various recommendations above include:

1. A situational analysis and an evaluation of the library and its services. This is the first step towards assessing the current status of the library services and products and the extent to which they meet the needs of the users. This process enables the library to identify its strengths and weaknesses which can then be used to demonstrate threats and opportunities.

2. Evaluation of the potential of Library 2.0 model as a possible framework for enriching the library services so as to meet the needs of the patrons. This is done best through working committees which should include users, librarians, managers as well as ICT personnel in the institutions. Basically, this committee explores Library 2.0 tools and assesses their suitability for efficient delivery of library services in the context of the specific institution.

3. The committee develops a strategy and plan of action through elaborate consultation with the other stakeholders. The strategy should clearly express the specific areas of library services Library 2.0 tools would support and how. It should also establish the roles of each member of the library community such as users, staff members, and sponsors in the process of adopting Library 2.0 model. It should also include the necessary work-plans, budgets, specific activities, timeframes and outcomes which can be summarized in a relevant matrix.

4. The strategy is executed in a phased manner gradually moving from experimentation to domestication of Library 2.0 tools and platforms. Necessary Library 2.0 systems and tools can be bought or developed in-house. It is advisable that the library begins with peripheral services before moving to the core ones. This would forestall possible disruption of key services during the experimentation period. Elaborate testing and modifications should be done before the official launch of Library 2.0 modules as per the implementation matrix.

5. Once the systems are tested and approved, all the users and staff members should be trained to build their capacity to make the best use of the systems. The training should be in-depth

and scenario-based so that users can get to acquaint themselves adequately with what they can do with the systems and how. Training manuals and other documentation should be made available online to facilitate easy reference. Where possible, users can act as peer-trainers. This normally yields better buy-in and uptake of the new model. Adequate time and resources should be set aside for this phase of the project otherwise it would not succeed.

6. The committee should constantly monitor the system and make provisions for modification, addition or removal of modules and parts thereof. Given that the Library 2.0 model uses tools that are dynamic, appropriate measures should be in place to detect changes in the infosphere and act accordingly.

Critically, Penzhorn and Pienaar (2009) assert that the success of any Library 2.0 project depends heavily on the participation of all the stakeholders. Specifically, they recommend that the librarians should devise the best strategies and tactics to unravel the needs and expectations of the users before they (librarians) can set out to meet them using the Library 2.0 tools such as social networking utilities.

4.9 Library 2.0 in Africa

Not much has been written about Library 2.0 in Africa. However, there are some libraries in Africa which have reportedly adopted the model already. One such library is the University of Pretoria (UP) library which developed an e-information strategy to facilitate optimum use of the new information and communication technologies to support the delivery of library services in 2006 (Pienaar and Smith 2008). The implementation of this strategy involved setting up new library structures, processes, skills and facilities to spearhead the development and delivery of electronic services and products to the users. This strategy also facilitated the establishment of an e-services unit to manage the electronic services offered by the library. The first step of the transition to Library 2.0 model, however, involved training of library staff on the various Web 2.0 tools. Critically, the training sessions were not made compulsory with the assumption that the staff who attended the training voluntarily would be more open to new innovations and are likely to integrate the tools in the library services and products they offer (Penzhorn 2009). The library initially set out to experiment with Blogs, YouTube and Flickr only but it gradually widened its scope to include LinkedIn, Facebook, web portal for South African academia, Google Earth, RSS Feeds, Wiki,

Slideshare, and Mobile blogs. According to Ina Smith and Christelle Steyn,[85] the library currently offers the following Web 2.0 tools and services:

1. A digital institutional repository;
2. Chat functions on the web;
3. Bookmarking and sharing functionality on the web;
4. Bookmarking and sharing functionality on the OPAC;
5. Google calendar on the web;
6. Widgets for some of the services (for example, catalogue);
7. The Library has a presence on Facebook;
8. Listing on Wikipedia;
9. Interactive gaming as part of the training programme;
10. Information specialists and other staff members use blogs and wikis as information tools to serve the clients; and
11. Agendas, notes and minutes of meeting are documented on wikis or blogs.

To promote the service, the library offered 60-minute workshops on what Library 2.0 is all about. It also held a Library 2.0 road show in which the benefits of the model were demonstrated (Penzhorn 2009). The impact of Library 2.0 on the library's usage has been profound. Significantly, the library is now able to reach the users where they already are. The 2.0 tools also provide effective communication mechanisms which are being utilized to connect users to the library staff and also to other users facilitating a rich communication system which has been used to enrich the library services. The tools have also been used to market library services to potential users and also to increase the web presence of the university (Pienaar and Smith 2008; Wyk 2008). The adoption of the Library 2.0 tools has placed the library in a favourable position to provide ongoing quality service in support of research and teaching at the university (Penzhorn 2009). However, Wyk (2008) and Penzhorn and Pienaar (2009) admit that uptake of the tools has been slow in spite of the benefits. They suggest that this slow uptake may be attributed to organizational inertia, general feeling of technical insufficiency and vulnerability (technophobia) by the librarians and library users.

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[85] These views were obtained through email interviews with them in June 2009. Smith used to be the Webmaster in charge of the Web 2.0 initiatives in the UP library before taking a new posting as the manager of the Digital Research Repository (UPSpace). She was succeeded by Steyn.

4.10 Summary

Library 2.0 is a very complicated and controversial model. While one group of librarians readily embraces it, another vehemently opposes it. Yet, another group stands in-between; choosing to deal with it cautiously. Regardless of where any of the groups stand, Library 2.0 is a reality that they will have to deal with at some point or another. This chapter defined the concept, its core principles and application in modern library services design and delivery. It also discussed some of the controversies around Library 2.0, such as the role of technology, the distinction between Library 2.0 and "Library 2.0", and whether Library 2.0 is better than Library 1.0. This chapter also discussed the relationship between Web 2.0 and Library 2.0 as well as the meme maps used to explain them.

It is not possible to conclude whether Library 2.0 is better or worse than the other models discussed in Chapter 3. This is because library communities exist in unique contexts that require inimitable responses in satisfying their information needs. It follows that some scenarios may rely on a mobile service while another may just be fine with a bookstore model. What matters at the end of the day is how well the needs have been met. However, considering the overall information revolution facilitated by ICTs that has currently engulfed most of the library users, Library 2.0 model has great potential to facilitate better satisfaction of library patrons' needs and wants and should be given due consideration by all progressive librarians.

CHAPTER FIVE – RESEARCH METHODOLOGY

5.0 Introduction

Research methodology defines what the research project is all about, how it is to be conducted as well as how to measure its success or failure. Research design is a strategic framework for action that serves as a bridge between research questions and the execution of the research project. Research designs are plans that guide the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. Like building plans, research designs ensure that the study fulfils a particular purpose and that the research is completed with the available resources.

This chapter discusses the research approach employed in this study. Specifically, it presents the research type and paradigm; data collection techniques and tools; data analysis approaches; and reliability and validity mechanisms to ensure that the research findings aptly answer the research questions and are applicable in influencing the decision of whether and/or how to adopt the Library 2.0 model for research libraries in Kenya.

5.1 Type of research – qualitative research

The researcher used an interpretive qualitative research methodology for this study. Some research scholars admit that providing a precise definition of qualitative research is not a mean feat (Snape and Spencer 2003). Denzin and Lincoln (2000) in an attempt to provide a definition suggest that qualitative research is a situated activity which locates the observer in the real world of the research subjects and consists of a set of interpretive and material practices that makes the world visible. These practices turn the world into a series of representations which include field notes, interviews, conversations, photographs, recordings and memos to the self. At this level, qualitative research involves an interpretive, naturalistic approach to the world as opposed to quantitative methods which attempt to hold some factors constant so that others can be studied. This implies that qualitative researchers study phenomena in their natural settings, attempting to make sense of, or interpret, the phenomena in terms of the meanings people give to them. Jacob (1987), Crabtree and Miller (1999) as well as Brannen (2004) aver that most research scholars hold this view on the nature and purpose of qualitative research.

On the other hand, a number of scholars (Bryman 1988; Miles and Huberman 1994; Hammersley and Atkinson 1995; Holloway and Wheeler 1996; Denzin and Lincoln 2000; Gillham 2000; Patton 2002), in seeking to unravel qualitative research, have focused on key aspects of methodology as defining characteristics of qualitative research. These aspects include: the overall research perspectives and the importance of the participants' frames of reference; the flexible nature of research design; the volume and richness of qualitative data; the distinctive approaches to analysis and interpretation; and the kind of outputs derived from qualitative research. These scholars also identify specific data collection methods as appropriate for qualitative research. These include observational methods, in-depth interviews, group discussions, narratives, and the analysis of documentary evidence.

Some scholars have also defined qualitative research in terms of what it is not (Ritchie and Lewis 2003). Strauss and Corbin (1998) delineate qualitative research as any research not primarily based on counting or quantifying empirical material. They conclude that it is a research method in which findings are not arrived at by statistical procedures or other means of quantification.

In summary therefore, it can be deduced that the following form key elements of qualitative research:

1. Aims which are directed at providing an in-depth and interpreted understanding of the social world of research participants by learning about their social and material circumstances, their experiences, perspectives and histories;

2. Samples that are small in scale and purposively selected on the basis of salient criteria;

3. Data collection methods which usually involve close contact between the researcher and research participants, which are interactive and developmental and allow for emergent issues to be explored;

4. Data which are very detailed, information rich and extensive;

5. Analysis which is open to emergent concepts and ideas and which may produce detailed description and classification, identify patterns of association, or develop typologies and explanations; and

6. Outputs which tend to focus on the interpretation of social meaning through mapping and "re-presenting" the social world of research participants (Ritchie and Lewis 2003).

From these definitions and suggestions, it can be deduced that qualitative research approaches apply techniques that enable the researchers to obtain in-depth information about the research problem going beyond a numerical perspective. It is also evident from the foregoing that qualitative research works well if conducted with small samples that facilitate closer interaction between the researcher and the subjects. The answers to the research questions are sought and interpreted from the perspectives of the subjects in the natural habitat. This may imply that the research may cut across various disciplines and the researcher should be able to adapt accordingly to obtain valid and reliable findings (Krauss 2005).

Although the comparison of research design to building plans made earlier has the connotation of rigidity, qualitative researchers propose designs which are more open, fluid and changeable in ways that are not defined purely in technical terms. According to this view qualitative research is an iterative process which requires a flexible, non-sequential yet guided approach. However, it is important to note that adherence to a specific research design is critical for any research study because it ensures that adequate research standards are followed.

Given that this project investigated and sought to recommend changes to services offered to people in defined communities, it was important that the social and cultural aspects of the issues and their effects on the subjects be considered. Qualitative research was best suited for these investigations. Specifically, this study sought to understand the information needs of the research communities in Kenya, whether and how they are currently being met by the existing models of service applied by the research libraries. The researcher heavily depended on the views of the library users and librarians managing the libraries to understand the relevance of the services as perceived by them. He also relied on their opinions on expectations of good research library services. Thus, he constructed meaning from the points of view of the participants. It is not possible to adequately unravel and interpret this data using other research methodologies because they must be investigated in a social and cultural context. As Orlikowski and Baroudi (1991) posit, there is no direct route to reality unmediated by socio-cultural factors. This view is also reinforced by Kaplan and Maxwell (1994) who argue that the goal of understanding a phenomenon from the point of view of the participants and its particular social and institutional context is largely lost when textual data are quantified. Given the research questions and environment in which the study was conducted, qualitative approaches were the most suitable to investigate and obtain appropriate answers.

5.2 Research paradigm - interpretivist

The word "paradigm" comes from the Greek παράδειγμα which literally means pattern, example or sample and reflects a pattern or example of something. The word generally connotes the idea of a mental picture or pattern of thought. Paradigms of research act as perspectives or models that provide a rationale for the research and commit the researcher to use particular methods of data collection, observation and interpretation (Pajares 1999; Kaniki 2006). The popular use and application of this term to research is attributed to Thomas Kuhn who described it essentially as a collection of beliefs shared by scientists or a set of agreements about how problems are to be understood. Kuhn (1959; 1962) emphasized that paradigms are essential to scientific inquiry and explained that no natural history can be interpreted in the absence of at least some implicit body of intertwined theoretical and methodological belief that permits selection, evaluation, and criticism (Pajares 1999). Paradigms are thus central to research design because they impact both on the nature of the research question: that is, what is being studied as well as the manner in which the questions are to be studied (Pajares 1999; Krauss 2005; Kaniki 2006).

Guba and Lincoln (1994) suggest four underlying paradigms for qualitative research: positivism, post-positivism, critical theory, and constructivism. Orlikowski and Baroudi (1991), following Chua (1986), suggest three categories, based on the underlying research epistemology: positivist, interpretive and critical. Whilst Guba and Lincoln's approach (1994) focuses more on ontology – the form of objective reality under research, Orlikowski and Baroudi's approach (1991) focuses on epistemology – the relationship between the reality under study and the research participants (Charney 1997). The researcher adopted the three-fold classification proposed by Orlikowski and Baroudi (1991) as best suited for this research given that it (research) relied on the interaction of the "material" reality (libraries and services) and the research participants (library communities and researchers). However, it needs to be clarified that, while these three research paradigms are philosophically distinct, in the practice of social research these distinctions are not always so clear cut (Lee 1991a). There is also considerable disagreement as to whether these research paradigms are necessarily opposed to each other or can be accommodated within one study.

Positivists generally assume that reality is objectively given and can be described by measurable properties which are independent of the observer (researcher) and his or her instruments (Robson 2002; Ritchie and Lewis 2003). Positivist studies generally attempt to test theory, in an attempt to

increase the predictive understanding of phenomena. It is generally accepted that this paradigm was associated with leading scholars such as Rene Descartes who wrote the *Discourse on Methodology* in 1637 in which he exhorted researchers to observe objectivity and evidence in the search for truth, and Isaac Newton and Francis Bacon who asserted that knowledge about the world can be acquired through direct observation (induction) rather than deduced from abstract propositions (Ritchie and Lewis 2003).

Critical researchers such as Hohendahl (1979), Mezirow (1981), Thompson (1981) and Hoffman (1987) assume that social reality is historically constituted and that it is produced and reproduced by people (McCarthy 1982; Friesen 2008). Although people can consciously act to change their social and economic circumstances, critical researchers recognize that their ability to do so is constrained by various forms of social, cultural and political domination of which technology is a tool. The main task of critical research is seen as being one of social critique, whereby the restrictive and alienating conditions of the status quo are brought to light. Critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and seeks to be the emancipator, that is, it should help to eliminate the causes of alienation and domination (Held 1980; Friesen 2008).

Interpretive researchers start out with the assumption that access to reality (given or socially constructed) is only possible through social constructions such as language, consciousness and shared meanings. The philosophical base of interpretive research is hermeneutics[86] and phenomenology[87] (Boland 1986; Benner 1994; Allen 1995). Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them. Snape and Spencer (2003) identify the following as key elements of interpretivism:

1. Perception relates not only to the senses but to human interpretations of what the senses capture;
2. People's understanding of the world is based on their interpretations of what happens around them and not just by experiencing them; and
3. Knowing and knowledge transcend basic empirical enquiry.

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[86] This is the study of theories of the interpretation and understanding of texts (Thompson 1981).
[87] Philosophical doctrine of understanding based on the study of human experience in which considerations of objective reality are not taken into account (Thompson 1981).

Research libraries and their collections are materials that exist in socio-economic and technological contexts. Further, a research library represents collections, services and organizations that have evolved over time. Consequently, an evaluation of the research library considers the present manifestation of a complex set of processes that have occurred over a long period of time. To construct an adequate understanding of the social context of these libraries, and the processes by which they influence and are influenced by the socio-economic and technological contexts of the users, an interpretive approach is more appropriate and was used by the researcher. This approach was also preferred because it does not predefine dependent and independent variables, but focuses on the full complexity of human sense making as the situation emerges (Walsham 1993; Kaplan and Maxwell 1994).

5.3 Research method – case study

Data for this research project was collected through multiple case studies. According to Kothari (2004), the case study method is a technique by which an individual factor or group is analyzed in its relationship to any other in the group. Yin (2003) defines a case study as an empirical inquiry that investigates a contemporary phenomenon within its natural context especially when the boundary between the "phenomenon" and "context" are not clearly evident. Case studies can also be perceived as methods for learning about a complex instance, based on a comprehensive understanding of that instance, obtained by extensive description and analysis of the instance, taken as a whole and in its context (Stake 1995; Yin 2003). Robson (2002) adds that case studies are detailed and reveal intensive knowledge about a single case or a small number of related cases. He also identifies the typical features of the case study research approach as (1) selection of a case(s) of a situation; (2) study of the case(s) in context; and (3) collection of information through a number of data collection techniques. Sommer and Sommer (2002) point out that due to its cost-effectiveness and intensiveness, case study, as a research methodology, is more appropriate to investigate innovations, their adoption and impacts. Sommer and Sommer (2002) also laud the richness and breadth of the materials in this research technique which facilitate in-depth reporting.

Case studies are not new to research. However, the history and development of the case study as a method of research is ridden with controversy. Tellis (1997), for instance, explains that the case study has been adopted and rejected in different periods in research history. The methodology was disused in the 1920s because it was not considered scientific when compared to statistics but it

returned to favour in the 1930s with the rise of positivism. The main criticism of the case study method was its reliance on single or limited number of cases giving it a "microscopic view" of the research issue making the findings hard to generalize. In spite of all these challenges, the case study remains one of the most common methods of qualitative research (Yin 2003). Yin (2003) attributes this apparent popularity to the fact that case studies investigate contemporary phenomena within their real-life contexts, especially when the boundaries between phenomenon and context are not clearly evident and multiple sources of evidence are used. This research methodology has been associated more with sociological and anthropological research studies which seek more in-depth information than quantitative research methods can deliver.

Case studies can be very complex (Stake 1995). The case study technique assumes that social reality is created through social interaction, albeit situated in particular contexts and histories, and seeks to identify and describe before trying to analyze and theorize (Stark and Torrance 2005). Case studies also assume that things may not be as they seem; the truth can only be laid bare after an in-depth inquiry. Another major challenge of the case study as a research method is the difficulty of drawing the boundaries of cases and how far their results can be generalized (though generalization of research results is limited in qualitative research). This issue is further exacerbated by the fact that cases are not independent but are influenced by other factors which may not be captured in the study (Stark and Torrance 2005).

The benefits of the case study method for this project include: (1) its capacity to provide in-depth and richer overall view of the problem of study (Kothari 2004); (2) its ability to provide understanding and experience of the research issues first-hand in real life context (Stark and Torrance 2005); (3) its engagement of a wide range of respondents in data gathering and generation of findings (Sommer and Sommer 2002; Yin 2003); and (4) its potential to provide data not yet available quantitatively (Yin 2003).

Case studies also have some latent disadvantages that the researcher was cautious about. These include: (1) case studies are time consuming and labour intensive; (2) cause-effect conclusions are not easy to substantiate; (3) case studies may be subjective due to their contextual interpretation and the desire of the researcher to emphasize particular points; (4) results of case studies are difficult to generalize because they are specific and contextual; and (5) case studies are relatively expensive

compared to other research methods. These disadvantages notwithstanding, a case study was the best method for this project.

Yin (1993) identifies three categories of case study as: 1) Exploratory – condensed case studies, undertaken before implementing a large-scale investigation; 2) Explanatory – used to demonstrate or unravel causal situations; and 3) Descriptive – aimed at describing situations and often applying appropriate theories. Stake (1995) on the other hand suggests three other categories: 1) Intrinsic – when the researcher has more than a research interest in the case; 2) Collective – when more than one case is studied; and 3) Instrumental – when the case is used to understand what is more than obvious to the observer. Still, Davey (1991) identifies six categories:

1. Exploratory – preliminary studies preceding the main study;
2. Critical instance case studies – examination of a single or a few cases with no expectation of generalizability;
3. Programme implementation case studies – investigates whether a programme is being implemented as intended;
4. Programme effects case studies – evaluates the impact of a programme;
5. Illustrative case studies – utilizes one or more instance to show what a situation is like; and
6. Cumulative case studies – aggregate different information collected from different sites at different times.

It is not easy to determine the case study typology applied in this study based on the categorizations above. Definitely, it was a combination of explanatory and descriptive as suggested by Yin (1993); collective and instrumental as proposed by Stake (1995); and critical instance and illustrative as argued by Davey (1991).

The researcher's choice to conduct multiple case studies was not aimed at gathering a sample of cases for some sort of generalization for the population. Conversely, the researcher viewed the multiple cases as multiple scenarios which complement each other. The study was not concerned with statistical generalization but with analytic generalization (Yin 1993; Robson 2002). An important feature of the case study is that if more than one investigator is involved, they typically take on essentially similar roles. The tasks cannot be reduced with rigid formulae with division of function as in other research methods (Robson 2002). Though the researcher collected most of the

data himself, he was also supported in this study by five research assistants who were all recent graduates with Bachelor of Science degrees in Information Science from Moi University, Kenya. To reduce the possible error levels, the researcher trained all the assistants and closely supervised their work on a daily basis. The assistants were very useful in observations and mystery shopping[88] in the libraries.

The case study sites were:

1. African Medical and Research Foundation's (AMREF) ***The Mahler Library*** based at the organization's headquarters and training school on Langata Road, Nairobi;

2. International Livestock Research Institute's (ILRI) ***InfoCentre*** at the organization's Nairobi Campus, off Naivasha Road;

3. Kenya Medical Research Institute's (KEMRI) Library at the headquarters in Ngumo area in Nairobi;

4. Kenya Agricultural Research Institute's (KARI) Library at the headquarters in Loresho, Nairobi; and

5. The International Centre for Agroforestry Research's (ICRAF) Library in Gigiri, Nairobi.

The researcher applied the information-oriented case study sampling strategy. Flyvbjerg (2006) explains that while random sampling focuses on representativeness alone, information-oriented sampling also focuses on expectations of information content of the cases. Thus, the researcher selected cases based on the amount and quality of information he expected them to generate about the research problem. The following specific criteria were applied:

1. Potential of the libraries to help the researcher maximize what he could learn due to their perceived commitment to modernize;

2. Variety of scenarios through the inclusion of local (KEMRI and KARI) and international (AMREF, ICRAF and ILRI) libraries which enabled the researcher to obtain rich and diversified findings applicable both locally and internationally;

3. Ease of access and anticipated cooperation from the librarians due to rapport established between them and the researcher;

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[88] This is the research information collection technique in which the researchers pose as ordinary members of the public so as to evaluate customer service related issues or assess quality of service.

4. The current level of adoption of new technologies in the delivery of library information services to the users;

5. The large and remarkably diverse population of the research communities served by these libraries; and

6. The expressed desire and willingness of the libraries to participate in the development and evaluation of new knowledge in librarianship.

5.4 Data collection techniques

This section discusses the data collection techniques and tools used by the researcher for this study. The population of the study as well as the pre-testing techniques used by the researcher are also discussed hereunder.

5.4.1 General techniques

Credible case studies combine on-site documentary analysis (operational policies, service specifications, and audit outcomes) with individual interviews of key players, group interviews, observations and critical incident analysis (Stake 1995; Gillham 2000; Stark and Torrance 2005). The researcher utilized documentary analysis, individual interviews, direct observation, focus group discussions, mystery shopping and social network analysis to collect data for this project. Methodological triangulation was also applied to ensure information veracity by converging different sources and types of data to build a true reality of the issues under study (Gillham 2000). In all the discussions and interviews, critical incident analysis was done and participants were encouraged to be as practical as possible by reflecting on specific incidents to deepen their understanding of the key issues.

Secondary data on the theories and principles of Library 2.0 were gathered from monographs, journal articles, white papers, web pages and professional articles available since 2005. Though a few of these were obtained in hard copy, most of them were accessed and used online. Web 2.0 media such as podcasts, blogs, wikis, chats, Slideshare and discussion boards were also used as sources of secondary data. However, credibility and timeliness of online data was carefully evaluated before it was considered authoritative. Evaluation of online content credibility was based on authoritativeness, uniqueness, currency, and accuracy, among other criteria.

5.4.2 Target population

The parent research institutions of the case libraries currently employ about 3,000 research and administration staff in total. Though all these are assumed to be users of the libraries, the actual active users are much fewer; estimated at below 1,000.[89] All the employees of these institutions – both research and administration – were the core population of this study. However, given that the focus of the study was on research, the majority (more than 75%) of the respondents were researchers. Similarly, all professional librarians managing and offering services in the case libraries were also considered as primary targets of the project. Besides, the libraries also serve some members of the public based on diverse criteria. For instance, ILRI offers membership to researchers – holding Master's Degrees and above – from other institutions. ICRAF also offers limited services to researchers from associated institutions. AMREF, KEMRI and KARI libraries are open to members of the public. These users were also considered but as secondary target population of the project.

5.4.3 Pre-testing

Pre-testing is the administration of the data collection tools to a small group of potential respondents for the purpose of identifying weaknesses with the tools which can then be corrected before the actual data collection (Bowden *et al.* 2002; Schaller 2005). Pre-tests are administered with the understanding that problems which may occur during the pre-tests are likely to occur also during the actual data collection. Weaknesses in data collection tools could be manifested in the mode of administration, terminology, structure or sensitivity of the questions asked (Collins 2003). Some scholars also argue that the researchers must conduct pre-tests themselves without delegating them to assistants because they understand the aims of the research better (Bowden *et al.* 2002). Pre-testing data collection tools and techniques helps the researchers to establish whether the respondents understand the concepts being probed in a consistent way and as intended by the researcher (Collins 2003).

Several pre-testing techniques exist. Some of these include focus group discussions, cognitive interviews and field pre-testing (Fowler 1998; Forsyth, Rothgeb and Willis 2004). The researcher applied the cognitive (intensive) interview technique and discussed with research experts, representing users, and Librarianship experts, representing librarians to test the suitability of the data

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[89] Estimates by librarians in the case libraries during preliminary interviews conducted on 13-17 October 2008 and confirmed during the actual data collection.

collection techniques and tools. The choice of cognitive interview was based on the understanding that it is more in-depth than the other techniques and evaluates not just responses to questions but also the thought processes influencing the answers. Thus, it was likely to generate better assessment of the questions, data collection tools and the approaches in administering them than the other techniques. The researcher interviewed twenty-seven respondents comprised of sixteen librarians and eleven researchers. The participants were chosen purposively based on expertise, convenience and availability. All the data collection techniques (see 5.4.1) and tools were pre-tested. The pre-tested data collection tools included questionnaires for both librarians and users; focus group discussion guides for both librarians and users; observation checklists; mystery shopping scenarios; and social analysis questions. Based on the findings, the researcher made several changes to the techniques and tools summarized hereunder.

5.4.3.1 Changes made to the questionnaires
The researcher made the following changes to the questionnaires:

Questionnaire for librarians
1. The researcher found that the question on library models for librarians was misunderstood most. The researcher listed the common models and made provision for explaining them during the interviews;

2. The researcher also reworked the wording of question 3a; some respondents felt that the question, as originally phrased, sounded like it was testing the librarians;

3. The researcher also included choices for the levels of importance for questions 3c and 4c;

4. The researcher removed question 3d which sought the view of the librarians on services they are offering but are not popular. There were views that it would be humiliating for librarians to confirm that they are wasting scarce resources on services which are not being used. The answer to this question has been deduced from responses to question 3c; and

5. The researcher also modified question 5 to integrate challenges and the solutions. So he added a column for solutions to enable the respondents to suggest possible solutions to the corresponding challenges they identified.

Questionnaire for users

1. The researcher added a new question (1d) asking the respondents to indicate their general area of research. This was useful in comparing the responses of the researchers from different areas of research;

2. The researcher also included the levels of importance in the table to make responses easier for question 3d;

3. The researcher reworked the Lickert scale of question 4f by adding "Very Poor"; and

4. The researcher also reworded question 6a to make it clearer. The previous version was long-winded and presented in passive tense.

The final versions of the questionnaires for the librarians (Appendix 5.5) and users (Appendix 5.6) are enclosed in the Appendices.

The researcher also used the test-retest approach in which he administered the same set of questionnaires twice to the same sets of respondents (one set comprised of three users and another of three librarians chosen by purposive sampling) after a fortnight and correlated the scores from both testing periods. The scores were generally consistent.

5.4.3.2 Changes made to the Focus Group Discussion approach for librarians

The researcher also changed the approach for the Focus Group Discussions (FGDs) for librarians. This change followed the realization that the discussions would be more fruitful if the researcher brought together librarians from all the institutions. The change was necessitated by the fact that there are very few librarians (an average of three) in every case library. So, he held two sets of FGDs; one for the head librarians of all the case libraries and another for the other librarians (librarians and assistant librarians) from all the five cases. The researcher had difficulties in organizing the FGD for head librarians due to their tight schedules and some degree of reluctance in creating time for the discussions. He therefore organized a half-day workshop at ILRI, Nairobi Campus, facilitated by Mr. Peter Ballantyne[90] which attracted them. Mr. Ballantyne made a presentation on the potential

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[90] Mr. Ballantyne is the Head of Knowledge Management and Information Services at ILRI. He is based in Addis Ababa, Ethiopia and is renowned for application of Web 2.0 tools in Knowledge Management. He presented his experiences in harnessing the potential of Web 2.0 tools in delivering information services with a focus on their potential for research libraries in Kenya.

applications of Web 2.0 tools in research libraries in Kenya. Thereafter, the researcher facilitated a focus group discussion based on the FGD guide for librarians. The programme of the workshop is enclosed as Appendix 5.9.

5.4.3.3 Changes of approach to Social Network Analysis

The researcher had initially set out to conduct direct interviews with the researchers and librarians to get information on social networks in and around the libraries. However, the pre-test indicated that many respondents were not comfortable giving the information. The researcher then consulted some experienced researchers in Library and Information Systems such as Professor Dennis Ocholla of the University of Zululand and Dr Bosire Onyancha of the University of South Africa (UNISA) who have experience with applying Social Network Analysis to Information Sciences for advice. It emerged from the discussions that there are very few cases in which researchers have conducted direct interviews with respondents to unveil their social networks. Therefore, the researcher conducted a fresh literature review on Social Network Analysis and established that the reluctance of the respondents to give information on their social ties arises from some intrinsic disadvantages of Social Network Analysis as a technique. Some of these include:

1. The questions to elicit social ties are often of a sensitive nature – some questions can easily cross lines into personal matters and are tantamount to invasion of privacy especially when respondents name people in their social networks who have not consented to participate in the research;

2. Sociograms (social network diagrams) do not hide the individual responses using statistical aggregates. The data in sociograms is raw, to a large extent, and is just presented as is. There is no room for anonymity. Further, the respondents have to disclose their own names, the names of the colleagues with whom they relate and the type of relationship(s) they are in. Thus, anonymity cannot be ensured. This degrades confidentiality of responses;

3. The respondents view the researcher as an "outsider" to the institutions and may not cooperate effectively;

4. Social Network Analysis facilitates the "participation" of the people identified by others even if they chose not to participate. Opting out of a study that involves Social Network Analysis may not totally preclude one from being portrayed in the sociograms;

5. Results of Social Network Analysis can be used to penalize respondents (for instance, when the sociograms indicate unfavourable linkages) so many potential respondents would not want to be involved in such a research project; and

6. The results of Social Network Analysis may result in hurt feelings of those members of the institutions who are portrayed in negative light. Similarly, participants may not want to list anyone's name unless it is in a positive context.

It also emerged from the consultations and literature review that direct Social Network Analysis is more suitably applied by members of a network or an institution. It is not easy for a researcher from outside the institution to conduct it effectively. Under these circumstances, it became apparent that the respondents would not be willing to participate in the study, let alone being able to be honest in their responses. Under these circumstances, the research data would have been skewed.

The researcher, therefore, decided to analyze the social networks using indicators of linkages such as research collaboration and co-authorship. The researcher conducted an analysis of co-authorship amongst researchers as an indicator of collaboration and social networks. The researcher also did the same for the librarians. The analysis was based on the entries of publications from the institutions listed in the online Web of Science (Science Citation Index; Social Science Citation Index; Arts and Humanities Citation Index; Conference Proceedings Citation Index – Science; and Conference Proceedings Citation Index – Social Science and Humanities). The researcher focussed on articles published from 1945 to the present. The revised set of questions for Social Network Analysis is enclosed as Appendix 5.7.

5.4.4 Data collection

The researcher conducted semi-structured face-to-face interviews using a combination of open ended and Lickert questions to gather information on services offered as well as the opinions of the users of the case libraries about the services vis-à-vis their expectations. The researcher also interviewed all the professional librarians to obtain their individual opinions on how they rate the services, the challenges they face, the reality of using the Library 2.0 model to address these challenges, as well as their view on the future of research libraries in the wake of the Internet revolution. This method was preferred because it allowed the researcher to gather more information

from non-verbal cues; it also enabled him to probe inadequately answered questions; and also gave the researcher an opportunity to create and administer new questions as he deemed fit to the benefit of the research in the course of the interviews. However, it was more expensive and time-consuming than posted self-administered questionnaires because the researcher had physically to meet the respondents to maximize its benefits. In this process, the researcher utilized separate interview schedules – with specialized questions – for users and librarians. The results of the interviews were recorded by the researcher on the respective questionnaires during the interviews. Responses which had not been anticipated were recorded in a notebook dedicated for this purpose.

The researcher also used ten (two for each case) focus group discussions (FGDs) with library users, consisting of five to seven members for each FGD, to establish the consensus of the users about the levels of the services they receive as well as their expectations and priorities and how these have or have not been met by the library services they received. Two categories (broadly based on grades of employment) of researchers were sampled using standard procedures for sampling and engaged in the focus group discussions (see Appendix 5.3 for set of questions). Besides these, the researcher also conducted two focus group discussions with the librarians (see Appendix 5.2 for the set of questions used). One FGD was held for a group of librarians and assistant librarians from the case libraries (one representative from each case) to shed light on what the majority perceived the role, performance, opportunities and challenges of the libraries were as well as the direction they ought to take. Similarly, a focus group discussion for head librarians was also conducted. As stated earlier, it was through a half-day workshop facilitated by the researcher and Mr. Ballantyne. Focus group discussions were preferred because they are more insightful, comfortable (less formal) and generally yield in-depth information than other methods. All the sessions except the FGD for head librarians – facilitated jointly by the researcher and Mr. Ballantyne – were facilitated by the researcher himself in appropriate environments so as to obtain credible data. The major points of the discussions were recorded by the researcher in a notebook dedicated for that purpose. The conversations were also recorded using a digital voice recorder as back-up data. There were separate schedules and semi-structured questions for each group – users and librarians.

Apart from the interviews and FGDs, the researcher also conducted participant observations both directly (openly) and through mystery shopping. For direct observations, the researcher monitored the library premises and services – from strategic positions in the libraries – and noted various issues

that would affect effective use of the libraries for research such as cleanliness of the library premises, customer service levels and appropriateness of shelving of resources, among others. Direct observations were also used to gather data on the number of users visiting the case libraries as well as the status of library equipment and materials. These findings were recorded on the direct observations checklist (see Appendix 5.8). For mystery shopping, the researcher used the research assistants unfamiliar to the staff members. These assistants posed as any other ordinary library user and experienced the services first hand. As Hogg and Gabbott (1996) suggest, mystery shopping was used together with the other methods like interviews and FGDs to enable the researcher to overcome possible weaknesses of these techniques. This was in recognition of the fact that 1) There is a discrepancy between real and reported behaviour; 2) Often facts are brought to light in the context of natural settings and may not be obtained through questioning; and 3) The verbal capabilities of the interviewee may limit the quality and quantity of information gathered (Hogg and Gabbott 1996). Mystery shopping (see Appendix 5.4 for the scenarios) was used to get an experience of the levels of service offered at the counters, shelves, Internet access points, reference sections and periodical desks. This technique was used to capture the library experience and processes as they unfolded rather than gathering opinions about them. To protect the subjects' right to informed consent and privacy, the researcher notified the users of the schedules, nature and locations in which mystery shopping was to be done (Norris 2004). The researcher also strived to remain as objective as possible while limiting unnecessary intrusion and disruption as results may have been erroneous if the subjects realized they were being observed.

The researcher spent about a month at each of the case sites. Data collection at each of the case libraries was generally conducted on a daily basis by the researcher with the help of research assistants. To ensure reliability, the research assistants were rotated in all the case sites. They used their first visit to the libraries mainly for mystery shopping and other observations. Given the relatively small number of active researchers (less than 100) in the case libraries, all the researchers who came to the libraries during the one-month period allotted to each library were interviewed. The researcher also collaborated with the librarians to identify usually active library users who did not visit the library during this period. The users were formally requested to participate in the research. The researcher then visited and interviewed the users who agreed to participate in the research in their offices. In some few cases, the researcher was also forced by the circumstances to leave the questionnaires with the researchers to fill in at their convenience. In such cases, the

researcher explained the questions to the respondents to facilitate effective responses. The librarians also helped the researcher to identify and interview some of the users who have reduced their usage of the libraries in the last six months. These interviews were critical in establishing why they were not using the library as actively as they had done before and the alternatives they were now using. Again, the participation of the users so identified was through informed consent. In some cases, such as KARI, ILRI and AMREF, where the library is open to some members of the public, the librarians helped the researcher to identify bona fide researchers both in the case institutions and other associated institutions. These are the respondents who were asked to participate in the research and those who agreed to being interviewed; not just all the people who came to the library during the period. The interviews and observations were based on schedules in order to ensure that comparable data was collected from each site (Stark and Torrance 2005).

5.5 Data analysis

Analysis is a challenging but exciting stage of qualitative research. Unlike quantitative research, there are no clearly agreed rules and procedures for analyzing qualitative data (Spencer, Ritchie and O'Connor 2003). Consequently, it requires a mix of creativity and systematic searching, a blend of inspiration and diligent detection. Because most of the data collected in this study was descriptive, content analysis, conversation analysis and other descriptive/interpretive techniques were used to sift, label, order, reduce and interpret it. The researcher also utilized computer-assisted data management and analysis systems. The researcher applied this combination of data analysis techniques so as to accommodate all the types of data collected during the study. The techniques were complementary.

5.5.1 Content analysis

This is an analytic technique in which both the content and the context of documents are analyzed. Themes are identified and the researcher focuses on the way the theme is presented or treated as well as its frequency of occurrence. The analysis is then linked to other variables such as gender or role of the contributor (Robson 2002; Spencer, Ritchie and O'Connor 2003). Scholars have identified the following as the basic steps of content analysis (Krippendorff 1980; Martens 2005) which the researcher applied in this study:

1. **Coding** - This is the basic tool of content analysis. It involves simply determining the basic units of analysis (for example, each word in a particular five-minute speech), and counting how many times each word appears;

2. **Categorizing** - This is the next level up in content analysis. It involves creating meaningful categories to which the units of analysis (for example, "terms signifying 'satisfaction' and terms signifying 'discontentment'") can be assigned;

3. **Classifying** - This level involves verifying that the units of analysis can be easily and unambiguously assigned to the appropriate categories;

4. **Comparing** - This is the next level. It involves comparing the categories in terms of numbers of members in each category (for example, a speech can be coded as having 135 "satisfaction" references and three "discontentment" references) and performing any relevant statistical analysis; and

5. **Concluding** - This is the highest, and often most controversial, level of content analysis. It involves drawing theoretical conclusions about the content in its context. The context of any type of communicative content is very important at this level of analysis.

Using this technique, the researcher analyzed the primary documents relating to the vision, mission, role and governance of the selected case research libraries. These documents included strategic plans, policies, evaluation reports and brochures. These provided insights into the perception of the libraries by their users regarding their role, performance, challenges and future. It was also used to analyze data obtained through interviews and focus group discussions.

5.5.2 Conversation analysis

This is a data analysis technique in which elements of a conversation are analyzed to derive meaning (Spencer, Ritchie and O'Connor 2003). Antaki (2002) asserts that transcription of recorded conversations forms a significant part of Conversation Analysis. He also identifies three questions that worry conversation analysts as: 1) is turning movement and expression into descriptions as accurate as writing down sounds as words? 2) can descriptions be impartial? 3) can they be complete? No concrete answer is available so far for these questions.

According to Woodruff and Aoki (2004), conversation analysis involves two steps. First, the analyst makes a moment-by-moment, turn-by-turn transcript of the actions in each encounter. Second, the

analyst examines these encounters individually and then comparatively to reveal a practice's generalizable orderliness.

Conversation analysis also relies heavily on what the participants see and hear. It doesn't depend on matters like feelings or motivation which cannot easily be seen or heard (Antaki 2002). Though this may appear to be a major weakness of this technique, it is also strength in the sense that it ensures objectivity in perception of the issues under study. This technique was useful for the analysis of the data collected from the focus group discussion and interviews with researchers and librarians.

5.5.3 Descriptive/interpretive techniques

Also known as hermeneutic techniques, these approaches concentrate on the historical meaning of the experience and its developmental and cumulative effects on the individual and society (Filippo 1991). Hermeneutics is a technique of interpreting phenomena and events by combining both the literal meaning of the words used as well as the human experience of the phenomena described (Filippo 1991; Abulad 2007). Hermeneutics emphasizes the role of contextualized human experience in interpreting a phenomenon correctly (Ramberg 2005). Abulad (2007) argues that linguistic knowledge alone, without experience, is inadequate in unraveling events or phenomenon correctly. Filippo (1991) adds that hermeneutics is formal and systematic and attempts to analyze human phenomena from different angles. Thus, hermeneutic research design focuses on all perspectives and expressions of phenomena (Filippo 1991; Lee 1991b; Abulad 2007).

Various branches of hermeneutics are used in qualitative data analysis. The researcher used the Heideggarian approach, the focus of which is upon how people interpret their lives and attach meaning to their experiences. This approach recognizes that the data generated by the research subjects becomes fused with the experience of the researcher during research. This means that the views of the researcher cannot be bracketed off, thereby recognising that no researcher can come to the study with suspended preconceptions. Thus within Heideggarian philosophy the researcher is an active participant in the study (Bale *et al.* 2003). Using this technique, the researcher began by interpreting the basic terminology and then moved on to interpret fully the meanings of the issues and events observed and/or captured by other means during the study. This analysis drew from the researcher's experience and skills to condense the data and extract meaning in various contexts.

5.5.4 Computer Assisted Qualitative Data Analysis Software (CAQDAS)

Computers and software tools aid faster data analysis. Though these systems do not actually analyze qualitative data, they facilitate storage, coding, retrieval, comparison, and linking while human beings do the analysis (Patton 2002).

The researcher used the Non-numerical Unstructured Data with Indexing, Searching and Theorizing (NUD*IST) software – also known as NVivo – to store, sort and manipulate the qualitative data and SPSS to process quantitative data electronically. This choice was based on the fact that both software packages are easy to use (have a good graphical user interface) and are readily available on the University of KwaZulu-Natal local area network (LAN). Besides, Patton (2002) reports that CAQDAS specialists generally agree that most of these systems do not exhibit any significant functional differences.

5.6 Reliability and validity

Research is largely about measurement of issues pertinent to the topic of study. Measurement in research is done according to some set of rules (Sechrest 1984). The credibility of any research project is pegged on whether and how it measures the pertinent issues. Errors in the issues to be measured as well as the tools or techniques of measurement may yield misleading results. Thus, a credible research project ought to not only generate valid results but also to be reliable. Reliability and validity are conceptualized as trustworthiness, rigor and quality in qualitative research (Golafshani 2003).

5.6.1 Reliability

Howell *et al.* (2005) define reliability as the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials. They further posit that research reliability aids replication, generalization and theory formulation. According to Mugenda and Mugenda (1999), reliability in research is influenced by random error which is the deviation from a true measurement of research issues due to factors that have not been addressed by the researcher. They add that as random error increases, reliability decreases.

In this study, the researcher ensured higher reliability through accurate coding, issuing explicit instructions to the participants in the project as well as maintaining objectivity throughout the

process. The researcher pre-tested the data collection instruments and techniques to ensure they were appropriate for the objectives of the study. The researcher also used the test-retest technique to evaluate the reliability of the findings as described earlier. The level of consistency of the responses was high thus indicating high reliability (Mugenda and Mugenda 1999).

5.6.2 Validity

Validity, on the other hand, refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher sets out to measure. It is the accuracy and meaningfulness of inferences which are based on the research results (Mugenda and Mugenda 1999). While reliability is concerned with the accuracy of the actual measuring instrument or procedure, validity is concerned with the study's success at measuring what the researcher set out to measure (Howell *et al.* 2005). In other words, validity is the degree to which results obtained from the data analysis actually represent the phenomenon under study (Mugenda and Mugenda 1999).

In this project, validity threats were likely to have come from the Hawthorne Effect (Holden 2001) which, for instance, may have arisen from librarians performing much better because of being aware that they are being observed. Another threat may have resulted from the Halo Effect (Murphy, Jako and Anhalt 1993) in which the observations by the researcher may have been influenced by the researcher's impression of the subjects. Being aware of these threats, the researcher strived to ensure the study achieved high validity through methodological triangulation, pre-testing of the data collection tools through cognitive (intensive) interviews with researchers (potential users) and librarians, and use of appropriate samples which were truly representative of the research population.

5.7 Ethical considerations

The main ethical concerns in this research revolved around data collection through direct observations in general and mystery shopping in particular. The researcher ensured that the participants were informed appropriately and thus exercised their right to informed consent. Again, the researcher collected data precisely for use only in the research and hereby reports the findings in aggregates. The confidentiality of the collected data was maintained throughout the research process. In fact, the researcher changed the Social Network Analysis approach, as explained earlier, partly to safeguard the confidentiality of the respondents.

The University of KwaZulu-Natal also conducts ethical tests on all proposals. No researcher is allowed to collect any data without ethical clearance from the relevant authorities. This research study obtained the requisite ethical clearance from the University.[91] Further, all the participants signed a participation declaration (see Appendix 5.1) indicating that they understood the nature of the research and their willingness to participate in the project.

5.8 Summary

This chapter presented the research methodology applied by the researcher in this study. The research paradigm, type, and method were presented here and justified. The researcher used an interpretive qualitative case study to collect data using interviews, focus group discussions, direct observation and mystery shopping. He also used separate sets of questionnaires and focus group discussion guides to collect data from the users and librarians. The data was analyzed using content analysis, conversation analysis and Heideggarian hermeneutics. Computer aided qualitative data analysis software, that is, NVivo and a statistical package, that is, SPSS were also used to organize and process the data. Reliability and validity of the results were ensured through effective sampling, pre-testing, test-retest and general objectivity.

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[91] The University of KwaZulu-Natal's research policy and ethical clearance process can be accessed from http://research.ukzn.ac.za/Libraries/BREC_MEETING_DATES_FOR_2009/Research_Ethics_Policy_V_-_Final_rec_from_ACB_31_July_2007_sen_30_may_2007_and_council_29_june_2007_1.sflb.ashx.

CHAPTER SIX – RESEARCH FINDINGS

6.0 Introduction

This chapter presents the findings of the research study. It provides summaries of the basic quantitative representations such as numbers of the respondents as well as their distribution by gender, age and education levels. The chapter also presents qualitative data collected through observations, mystery shopping, focus group discussions as well as social network analysis.

6.1 Demographic profile of the two populations

In this section, the profiles of the population of researchers as users and the research librarians are described.

6.1.1 Profile of the researchers in Kenya

One hundred and sixty two library users were interviewed. Of these eighty eight (54%) were male while seventy four (46%) were female. It can be concluded from the findings that there are more male than female researchers in Kenya. However, the gap (8%) is not as wide as it is popularly believed to be.

Fifty two (32%) of the researchers interviewed are between 31 and 40 years of age. Forty eight researchers (30%) are between 20 and 30 years of age, and forty nine (30%) researchers are between 41 and 50 years of age. Only thirteen (8%) are over 50 years old. Fig 6.1 summarizes this distribution. Thus, it can be concluded that most of the researchers in Kenya are fairly young. It also follows that most of the users of the research libraries in Kenya are under 50 years of age.

Sixty nine (43%) of the researchers interviewed currently hold Master's degrees. There is also a sizable portion – eighteen (11%) – holding professional Diplomas. This latter category mainly comprises technologists supporting the research process, especially in the laboratories. Fig 6.2 below summarizes this distribution by level of education.
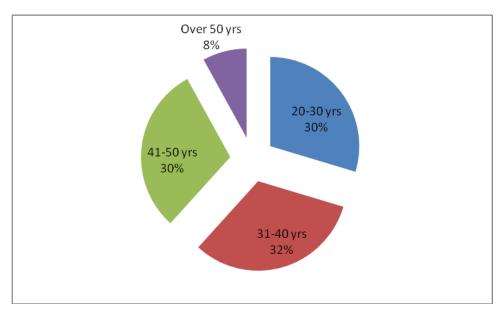
Fig 6.1 - Distribution of the researchers by age
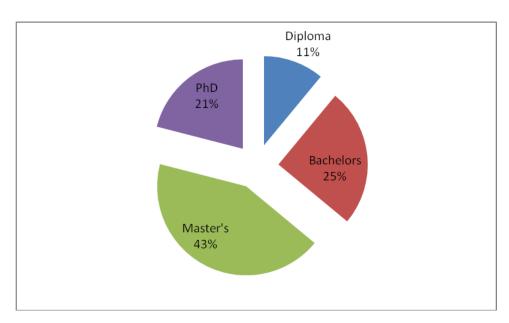
Source: Researcher

Fig 6.2 - Distribution of researchers by level of education

Source: Researcher

The research interests of the researchers interviewed were diverse, ranging from poverty eradication to rumen molecular biology however some common themes were identified. For instance, all the research institutions have varied interests in environmental management. The findings also indicate that researchers at KEMRI and AMREF share interests in several areas including public health,

HIV/AIDS, tuberculosis (TB), malaria and health statistics. Similarly animal scientists at KARI share a lot in common with ILRI researchers including animal breeding, animal feeding, animal diseases and animal production among other areas. Similarly, crop scientists at KARI share several research interests with scientists at ICRAF. Strangely, researchers at KEMRI and ICRAF also share research interests in medicinal plants. No trends or inclinations predetermined by research interests were noted.

6.1.2 Profile of research librarians in Kenya

The case libraries employ twenty professional librarians. Of these sixteen, representing 80%, were interviewed. One half (eight) of the librarians interviewed were male while the other half were female. Six (37%) of the librarians are below 30 years of age while four (25%) are between 31 and 40 years of age. Thus, ten (62%) of the librarians are below 40 years of age. Fig 6.3 below represents this age distribution.

Fig 6.3 - Age distribution of research librarians
Source: Researcher

Seven (44%) of the librarians currently hold Bachelor's degrees while six (37%) hold Master's degrees. So far none of the research librarians interviewed holds a PhD degree even though some have enrolled for PhD studies. Fig 6.4 summarizes the distribution.
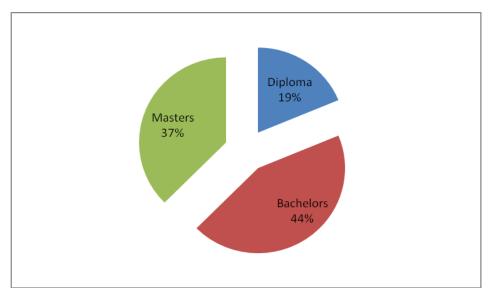
Fig 6.4 - Education levels of research librarians
Source: Researcher

6.2 Membership of research libraries

This section presents findings of the study on the various elements of membership of the research libraries such as number of members, length of membership as well as willingness to maintain it.

6.2.1 No membership registers

Few research libraries maintain a membership register. Consequently, it was not possible to ascertain the exact number of users. However, the librarians estimated that there were about 120 to 300 users in each library depending on the size of the institution and whether the organization has a training programme or not. Two parent institutions of the case libraries offer diploma, postgraduate and short professional courses. Thus, their membership is different from the others in terms of numbers and composition; they have more users who are basically students at different levels of study – Diploma, Postgraduate Diploma (PGD), Masters and PhD.

In principle, all the employees of the research institutions are considered as users of the libraries. Consequently, membership is also influenced by staff dynamics in the organization. For instance, the number of users increases or decreases depending on the staff turnover. One of the parent institutions of the case libraries had retrenched staff the previous year thus reducing the number of

users of the library drastically. Of the users interviewed, 129 (80%) were members. Fig 6.5 represents this distribution.
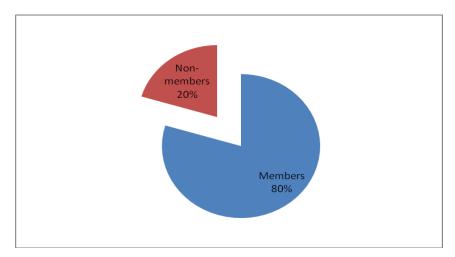

Fig 6.5 - Distribution of respondents by membership

Source: Researcher

Thirty eight (30%) of them had been members for less than three years. Most of these were graduate students and visiting scientists. Thirty five (27%) had also been members for between three and six years. Thus seventy three (57%) of the users interviewed had been members of the research libraries for six years or less. Significantly, twenty nine (22%) had been members of the libraries for more than ten years. Most of these are permanent employees of the research institutions. Fig 6.6 summarizes the membership period distribution.

6.2.2 Likelihood to stop membership

Sixty six (51%) of the users interviewed said that they will stop their membership in the next three or so years. Most of these are students or visiting scientists who will return to their parent institutions or countries of origin after their programmes. Notably, none of these members said they would stop their membership because the libraries do not meet their research needs. Three (2%) of the members are not sure whether they will continue their membership or not. One was on transfer to another station (Kakamega) which is far from the library while two were about to retire. Fig 6.7 represents this distribution.
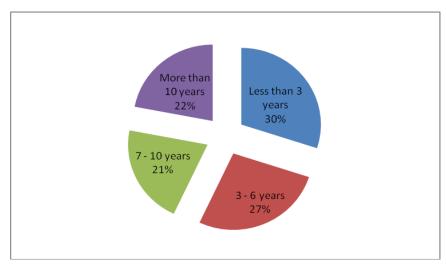
Fig 6.6 – Distribution of members by membership period
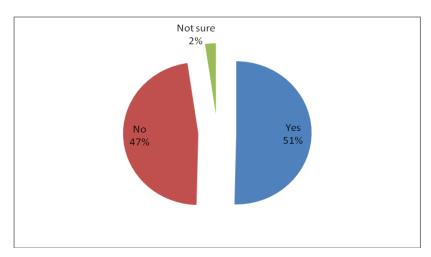
Source: Researcher

Fig 6.7 – Likelihood of stopping membership

Source: Reseacher

6.2.3 Non-members would like to join

Nineteen (58%) of the non-members would like to be members of the libraries so as to get unlimited services from the libraries. Some of these non-members also said that they are about to undertake various study programmes and so will need the library more. Ten (30%) would not like to obtain membership. This category of users said that they are not using the library for research or live far from the library and only use it occasionally. There are others also who said that they are already getting the services they need even without being members. Four (12%) of the non-members are not sure whether they would join or not. Fig 6.8 represents this distribution.
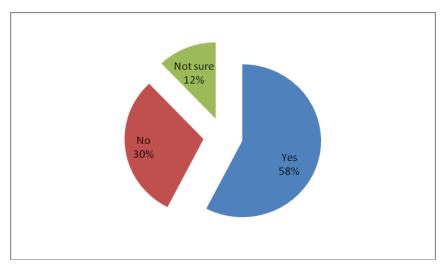
157

Fig 6.8 – Willingness of current non-members to become members

Source: Researcher

6.2.4 Membership increased or reduced?

Nearly all the librarians interviewed said that there has been a change in the library membership in the past three or so years. Only one respondent was of the view that the research libraries have not changed in the period. While eight (53%) of the librarians who said the libraries have changed viewed the change as negative, seven (47%) said the change was positive. Those who perceived the change as negative explained that membership had decreased because their parent institutions had experienced high staff turnover over the period. Critically, some also pointed out that some potential users are now relying on independent online sources – some even using individual mobile phone Internet modems – and are not keen on maintaining library membership. One research library had been supporting small research centres conducting related research. However, during this period, two of these centres established their own libraries and thus reduced its membership.

Those who viewed the change as positive pointed out that the number of the members had increased over this period. They attributed this increase to the introduction of new projects hence more staff and an increased need for new information; expansion of training programmes; and the convenience of using the library through the use of ICT tools enabling users to access services and products from their offices or homes. Some librarians also averred that the number of members had increased due to the introduction of cybercafé facilities in the libraries. There was consensus,

however, that the number of users coming into the physical library had reduced but the number of users accessing services online had increased.

6.2.5 Libraries have improved

Apart from changes in membership, findings from interviews and focus group discussions with both librarians and users also revealed that most of the case libraries have improved in the past three or so years. They explained that most of these improvements had been necessitated by the need to meet the emerging interests of the users and thus retain them. They explained that most improvement has been done through digitization of services and collections as well as improvement of the physical spaces of the libraries. Both librarians and users also agreed that there are still many areas of the libraries that require more improvement. They expressed hope that the current momentum of change will increase so that the libraries may play their roles effectively. However, they warned that libraries are likely to face challenges relating to inadequate funding, general resistance to change, skill gaps, as well as steep learning curves (for instance, how to deploy and make the best use of new ICT systems) which may be difficult to surmount. They proposed that these challenges can be overcome through good planning, phased implementation of change, intensive involvement of the users, and aggressive resource mobilization.

6.3 Operations of research libraries

This section presents the findings on the operation of research libraries in Kenya. Specifically, the findings relate to operation issues such as strategic planning, role definition, participation of users, compliance with new legislation, and challenges affecting service delivery.

6.3.1 Strategic planning

Most of the research libraries do not have documented strategic plans or vision and mission statements. Most of the library plans are integrated with the institutional strategic plans. Consequently, current library plans are extracted from the organizational plans. All the librarians suggested that libraries should develop their own documented strategic plans. Most of them said that their libraries are likely to develop the plans in the next year or so. Nonetheless, the research libraries aspire to be one-stop centres of excellence offering timely information services and resources that support their areas of research on demand, conveniently and affordably.

6.3.2 Role of the Research Libraries

Findings from the focus group discussions and interviews indicate that users and librarians have generally similar understandings about the role of a research library. There is consensus that a research library supports research activities and is as important to research as a laboratory. The specific roles identified include:

1. Providing a physical space that is conducive for the researchers' work;

2. Supporting the researchers in identifying, searching, retrieving and using information necessary for their research projects and interests through reference services, literature searches and the provision of online and physical information resources such as books, journals, reports, and conference proceedings, among others;

3. Repackaging and disseminating research findings to the various categories of consumers such as farmers, policy makers, or the general public through strategic media and events;

4. Providing a platform for interaction and dialogue between researchers and other researchers as well as between researchers and research stakeholders;

5. Acting as the hub of institutional knowledge which collects, organizes, preserves and provides access to various types of organizational knowledge tools such as brochures, leaflets, reports, slides and other forms of knowledge products; and

6. Creating a reference point of all research information in the organization to enable researchers and other interested parties to search and retrieve information on topics and findings of various research projects with a view of guiding the identification of research gaps and selection of research topics for maximum impact.

There was also a general consensus that even though the primary role of research libraries is to provide research material and information, some researchers were also of the view that a research library should also provide general and current awareness information. One participant in one of the focus group discussions made the following statement which captures the essence of this point of view: "It is very bad when you are a good scientist but you don't know about current affairs." Some of the information resources the users suggested for inclusion are *Reader's Digest*, fiction books, business books, resources on leadership and biographies.

The head librarians were of the opinion that libraries have played these roles well. However, most of the users and middle-level librarians were of the view that research libraries have not played these

roles effectively but emphasized that there are a number of changes currently being introduced to bridge the gaps. The librarians said that most of these changes revolve around digitization of information resources and introduction of Web 2.0 tools in some libraries. Other areas include provision of functional ICT tools in the library, user education, marketing of information products and services in the library and active involvement of users in decision making in the library. Researchers emphasized that the libraries need to go beyond buildings and collection and integrate these with good customer service so as to meet the needs of the users effectively. "In this day and age you do not only consider huge buildings and collection of books," one researcher said during the focus group discussions for users. They also pointed out that research librarians need to assert their role in the research process, particularly during the proposal writing and remain part and parcel of the projects throughout their lifecycles. One librarian also argued that for the research librarian to be relevant he/she must attach himself or herself in the research value chain. This librarian emphasized that the research librarian must be seen to add value. Here is what he said: "Librarians need to have something to bargain with ... Librarians must have something to place on the table." It was suggested that one of the possible bargaining chips could be specialized skills in seeking and providing ready information to the researchers.

Researchers also emphasized that a research library should manage institutional knowledge products and store them permanently in the appropriate formats and media. They decried a phenomenon which they said is common in most research institutions where grey literature such as minutes of important meetings or PowerPoint presentations which are useful for research and policy making get lost without trace. They suggested that the research library should act as the institutional depository where such information can be stored permanently for future reference.

Findings from focus group discussions with librarians also revealed that they have not played a significant role in scholarly communication. Only one case library is in charge of a peer refereed journal published by the parent institution. This particular library coordinates the editorial process and production of the journal. The other libraries only manage lists of articles published by researchers in the institution on a regular basis. The findings indicate a general view that libraries should take the publication of research more seriously. It was also suggested that the librarians should influence dissemination provisions in research proposals and should take charge of that process, particularly with non-researchers such as policy makers and the general public. One

participant in one of the focus group discussions for librarians said: "Publishing should be moved to the library so that it [library] ceases to be just a distribution unit."

6.3.3 Compliance with new legislation

Recent information legislations and policies in Kenya such as the Freedom of Information Policy (2006), the Kenya National ICT Policy (2006), Kenya Communications (Amendment) Act (2008) as well as the new constitution promulgated on 27th August 2010 generally guarantee the rights of access to information through various media. This legislation and these policies require libraries and institutions to store information in ways that would facilitate easy access and use. Findings from this research indicate that even though most of this legislation has not been enforced, most of the case libraries are generally compliant. It was also pointed out that given that most of the case libraries do not hold any classified records, compliance with the requirements of the above legislations and policies is generally possible. The only challenge would be on how to cope with huge requests because most of the case libraries are small. The librarians suggested that the libraries should invest more in ICT systems which would enable them to serve the needs of the users and general public without requiring them to come to the physical libraries.

6.3.4 Library management system

Four of the case libraries use Inmagic software. The other one uses Web-based Library Integrated System (WEBLIS), which is based on Computerised Documentation Service – Integrated Set of Information Systems (CDS-ISIS). The library systems were introduced to the libraries in the mid 1990s. The librarians stated that they prefer Inmagic because it has many modules covering most of the library operational needs; is user-friendly; supports integration to the web; generates customizable reports; integrates with email systems; supports upload of image files; is upgradable to include more features; and supports Extensible Markup Language (XML) file formats. However, the librarians also explained that Inmagic is too dependent on the Internet; requires frequent updates which is costly; does not show when a user's membership expires; has no local technical support (currently obtained from South Africa); does not allow manual filing of updates; and lacks tight security features – anyone logged to a computer where the software is installed can edit the library records. On the other hand, the librarians who use WEBLIS said they chose it because it is open source and is fully integrated. However, they also said that being open source, the system lacks regular updates with the last one having been made in 2007. They also said that it uses controlled

vocabulary for searching rather than a natural language approach and is server-based making it impossible to use when the server is not working.

6.3.5 Participation of users in library decisions

Generally, users do not participate actively in determining what or how they are served in the libraries. However, findings from the interviews and focus group discussions with researchers and librarians revealed that there are some efforts to get the views of senior researchers on what materials should be acquired on a yearly basis mainly through book lists. Nonetheless, it was noted that these requests are sent out during the annual planning and budgeting season when the researchers are not able to respond to them adequately because of the pressure of work which increases during the planning season. Some libraries also conduct some form of user surveys. However, these are irregular and far-between.

In one of the research institutions there is a Library and Information Committee which analyzes the lists of materials requested by the researchers. Interestingly, participants at a focus group discussion for users in that institution expressed no confidence in that committee because it is reportedly composed of "retirees" whom they said lack the interest or competence to review modern information resources for emerging research needs. They were also not happy with the fact that the majority of the members of this committee are librarians and not users. Further, most of the requests of the users are not acted upon. Consequently, the users feel that the whole exercise of inviting their input is a mere public relations gimmick that yields nothing for the users. Consequently, feedback from users is normally low.

Generally, the users stated that they have not contributed anything significant in the management of their libraries but they said that given a chance they would like to. They proposed that the library management should establish transparent systems of capturing users' views and preferences on a continuous basis. They also suggested that using an appropriate ICT system as part of the Library Management System would be beneficial. Some of the challenges that the librarians and users could foresee when involving the users actively in determining library services and products include heightened expectations which may not be easy to satisfy; varying and diverse opinions which would not be easy to merge or deliver; and huge time requirements for the users and library managers to sift and integrate the suggestions. They pointed out that the benefits of adequate involvement of the

users in decision making in the libraries include ownership, user-centricity of the services and products, improved usage (frequency and intensity), and high impact.

6.3.6 Collaboration

Most libraries collaborate with each other through networks and consortia. Except for two case libraries which are sponsored by the same organization and therefore have institutionalized systems for collaboration, the other libraries work together in ad hoc manner. The findings also indicate that the researchers have no established collaboration networks. However, they said that they collaborate individually with other researchers working on similar projects (more details on this are provided on page 33, that is, the section on Social Network Analysis). The researchers explained that effective collaboration would enable them to pool resources, share information materials and get exposure on what is being done elsewhere. No collaboration was suggested for termination.

6.3.7 Challenges to the libraries

Fig 6.9 below summarizes the major challenges facing research libraries as identified by the librarians and how serious they were perceived to be (on a 1 to 5 Lickert scale in which 1 is very serious while 5 is not serious):
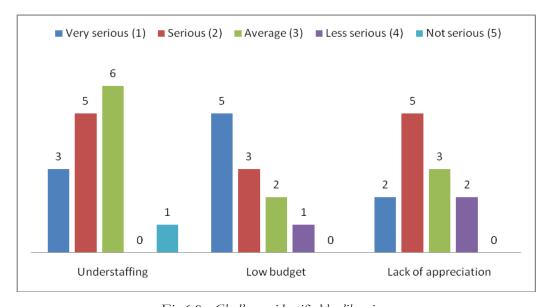

Fig 6.9 - Challenges identified by librarians

Source: Researcher

Table 6.1 – Challenges and suggested solutions by both librarians and users
Source: Researcher

Challenges	Suggested Solutions
Inadequate funding	Fundraising, exchange programmes, donations, allocating a portion of research grants to the library.
Inadequate ICT systems	Acquire and install WiFi equipment to create adequate wireless hotspots, establish infrastructure to enable users to plug in and use their own equipment, increase the number of computers used by the public, get a dedicated Internet link for the library, increase the number of power sockets.
Inadequate staff	Retrain the library staff on ICTs, public relations and marketing, hire more professional staff, develop an internship programme, improve the working conditions of the librarians, develop succession plans for librarians, support continuous training of librarians through short courses and workshops, and promote the spirit of teamwork amongst librarians.
Inadequate collection	Acquire current information materials, subscribe to more "high-end" online journals, establish collaboration networks to share information resources, focus more on electronic resources since they are more affordable and readily available to a wider section of users.
Inadequate space	Reduce shelf areas by digitizing the collection, create private reading rooms, create collaboration (group work) areas, decentralize (embed) the libraries in the centres to reduce pressure on the main libraries, expand the physical library where possible.
Poor dissemination strategy	Embrace aggressive public relations and marketing of information products and services in the library, utilize the potential of ICTs, make the library visible where it matters.
Internal politics; unfavourable organizational structures	Establish suitable policies and structures which focus on institutions and not individuals, work with corporate communications units to reduce grapevine (gossip), establish clear career paths and succession plans for the librarians.
Lack of linkages	Create a niche for the library and use it to negotiate favourable linkages with other organizations, departments and individuals.

The most serious challenge the research libraries in Kenya face is inadequate funding. Both librarians and researchers agreed on this. Other challenges include inadequate ICT systems, understaffing (numbers and competence), collection, and space; poor dissemination strategies; internal politics in the organizations and within the libraries; and lack of adequate linkages with other librarians and institutions (libraries and organizations). There was also consensus amongst the librarians and users that these challenges are serious and are affecting the performance of the libraries adversely and need to be dealt with conclusively and promptly. Table 6.1 summarizes the challenges and the corresponding solutions suggested.

6.4 Library service models

This section presents findings of this research on the level of awareness of the librarians of library service models as well as how the common models compare with the Library 2.0 model.

6.4.1 Awareness of library service models

Interviews and focus group discussions with librarians confirmed that most librarians are not aware of the models of library service they are using. It emerged that most of the time the services are planned based on what similar libraries are offering. After the researcher explained the common library service models, it was found that most research libraries in Kenya apply the traditional model but are now steadily embracing the digital model as well. The embedded model is also common whereby some research centres or departments have their own specialized libraries close by. It was also evident that there is a steady trend towards the digital library model with some case libraries having made very bold steps in that direction. Though some libraries are already experimenting with various Web 2.0 tools, it was also evident that no case library currently applies the Library 2.0 model. Similarly, no librarian was aware of any library in Kenya applying the Library 2.0 model.

The librarians pointed out that the models currently applied in delivering services in most of the research libraries do not support easy compliance with the new legislation. There was consensus that it would be easier to comply with these requirements if the libraries digitized their collections and services. However, they pointed out that some of the legislation, for instance, the Freedom of Information Bill, is ambitious and likely to face many challenges.

6.4.2 Library 2.0

It was evident from the group discussions and interviews that the models applied by the libraries only meet the basic needs of the users. However, there were strong views by both librarians and researchers that the libraries should adopt new models which embrace ICT tools to deliver library services and products to the researchers when and where they need the services. This need seems to be the major impetus for the adoption of digital models of library service. After the researcher explained the fundamental principles of Library 2.0 to the librarians, there was a general perception that Library 2.0 would be a better model to guide the adoption of new trends in library service design and delivery. Specifically, the librarians said that the model holds great potential for convenient and round-the-clock delivery of library services. Some librarians, however, wondered whether it is really possible for the library to be everywhere as one of the principles of Library 2.0 states. They had reservations about the rationale behind this and pointed out that the library only needs to be where its users are; not just everywhere. The librarians also warned that research libraries in Kenya are likely to face the following challenges when implementing Library 2.0 model:

1. Copyright and intellectual property issues arising from digitization;

2. Inadequate funding;

3. Poor attitude (technophobia, resistance to change, apprehension, perception of Web 2.0 tools to be informal and for the youngsters);

4. Definition of who will use the library and how;

5. Lack of institutional support (internal wrangles);

6. Time constraints;

7. Getting materials that meet the diverse needs of all the users;

8. Inadequate ICT skills (both staff and users);

9. Inadequate infrastructure such as electricity and Internet connection especially in the branch libraries;

10. Security issues arising from possible overexposure (technology-wise and also physical access to the library facilities) which may cause a security nightmare for the libraries and parent institutions; and

11. Lack of leadership as most chief librarians are challenged technologically and are generally resistant to techno-based change.

The librarians also suggested that research libraries should implement the Library 2.0 model in a phased manner using showcases and demos. They also cautioned that any Library 2.0 projects should be handled with care to avoid disruption of library operations and services. The librarians were of the view that a library using Library 2.0 model is likely to be more relevant than a library that does not. Similarly, they said that librarians applying the model are most likely to be appreciated by the institutions and to remain on the payroll than those who do not. One participant in the focus group discussion for the head librarians asserted that libraries should embrace change openly. He used the story of the four lepers narrated in the book of 2 Kings 7:3-4 in the *Bible* to illustrate his point. These lepers recognized that if they stayed where they were, they would surely starve to death but if they went to the enemy – Arameans – there was a probability that they would be spared. They chose to go to the enemies only to realize that they (enemies) had fled leaving behind food and other treasures. Similarly, he said, the libraries that choose to remain conservative fearing the consequences of new trends such as Library 2.0 will surely become obsolete, and "die". Conversely, those which choose to embrace change in spite of the risks thereof may be affected in several ways but they also have the probability of benefiting from the same. From the foregoing, embracing change in libraries, to the librarians, seems not to be an option but a means of survival.

6.5 Research library services

This section presents the services that research libraries in Kenya offer, how important the librarians and researchers perceive them to be as well as where else the researchers seek information.

6.5.1 Important services according to librarians

During the interviews with librarians, fourteen respondents rated access to the Internet as a very important (scale point 1) service while thirteen respondents also rated access to online journals as very important (scale point 1). Seven respondents also rated reference and provision of books as very important services. Fig 6.10 summarizes the responses.

6.5.2 Important services according to researchers

On the other hand, the users rated access to online journals as the service they consider most important (scale point 1) followed by seeking help from librarians, access to online research papers, borrowing books, surfing the World Wide Web (WWW) and using print journals in that order. Fig 6.11 represents these preferences.
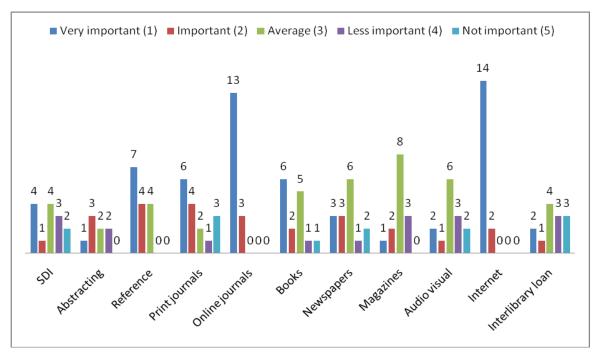
Fig 6.10 - Services offered by the libraries as rated by the librarians
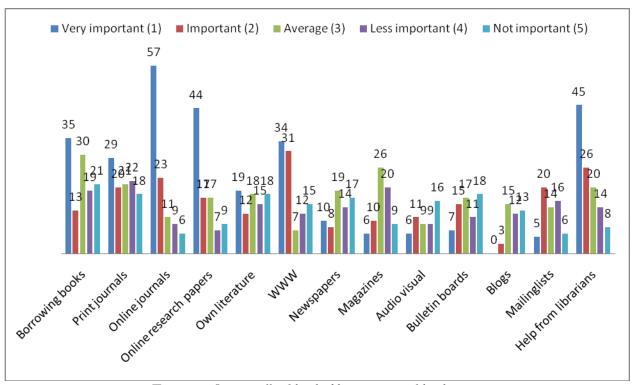
Source: Researcher

Fig 6.11 - Services offered by the libraries as rated by the users

Source: Researcher

These findings were corroborated by the results of the focus group discussions with users which showed that the most popular service offered by the research libraries, according to the users, is access to the Internet followed by access to online journals. A number of users also said that they still use the physical library space when they need to concentrate on a project. Many users in one of the libraries said that they like the interlibrary loan service. Other services liked by most users include literature searching and alerts on new items in the library. On the other hand, users do not like their colleagues who keep library material for too long; unreliable Internet connections; lack of WiFi connections in some libraries; tedious borrowing procedures such as being asked to leave one's national identity card in the library during the loan period; inadequate opening hours; poor customer services; and crowded reading areas.

The researchers also said that they use the library as a work space. Others also said that they value photocopying services as well as the library computers which they use to analyze research data and process assignments. Curiously, one user said that he values access to television and especially Digital Satellite Television (DSTV) services. Another researcher in a different institution, however, said he does not appreciate the presence of a television set in the library which, according to him, is too noisy. This latter researcher said that he has reduced the time he spends in the library because of a television set which is coincidentally located at the point from which he uses the library and which makes a lot of noise.

The users wished to get reprographic services such as scanning, printing and photocopying; a shop to buy basic stationery, gifts, basic software such as antivirus or statistical packages; provision of multimedia materials on DVDs or downloads; facility to capture, organize, store and provide access to grey literature generated by the research institutions and their partners; a Wide Area Network (WAN) linking all centres of research and helping the researchers to remain in touch with each other; an Intranet (local "Google") containing relevant information; systems to detect plagiarism; delivery of information materials to the researchers' offices and duty stations; private reading spaces; touch-screen facilities where users can peruse documents; and better customer service. There were no specific services that the users did not particularly like. However, they suggested that reduction of physical resources would facilitate the reorganization of the physical library space which would then enable the libraries to provide more public reading space, private reading rooms as well as more

comfort. Some research institutions are also being asked to provide Internet connectivity in some remote areas but this has not been done yet.

A participant in the focus group discussion for librarians recommended that research libraries should not hold newspapers. She felt that newspapers do not contain information that supports research and that they attract idlers to the insufficient library space. The general feeling, however, was that the newspapers are important but the usage should be regulated. They suggested that one way of regulating newspapers is by reducing the copies as well as the seats for reading them. It was also proposed that the library should maximize those who just come to read newspapers. These views were also corroborated by results of the focus group discussions and interviews with the users. However, one researcher actually recommended that libraries should keep back copies of newspapers and "not just sell them off".

6.5.3 Where else the researchers get information

The researchers said that apart from their own libraries, they obtain the information they need for their research projects from other libraries (University of Nairobi, Catholic University of East Africa, Aga Khan University and International Centre for Insect Physiology and Ecology [ICIPE]); seminars, conferences and workshops; personal exchanges with colleagues and stakeholders; mass media (newspapers, radio, TV); exhibitions; own home library; Internet (Google, Google Scholar); field visits; online databases; government institutions (line Ministries such as Health, Livestock Development, Environment, Forestry Services and Agriculture); records from local administration (chiefs, District Commissioners); collaborating researchers, projects and programmes; classrooms (notes, handouts, lecturers, classmates); information providers (specialized research institutions); public forums; journals accessed through individual membership; and national and international research networks. Eighty three (51%), that is more than half of the respondents, said that these other sources of information were complementary to the library sources. Twenty eight (17%) said they were better than the library sources while twenty one (13%) said they were worse than the library sources. Thirty (19%) of the respondents were not sure whether these sources were better or worse than the library sources. Fig 6.12 presents these results.
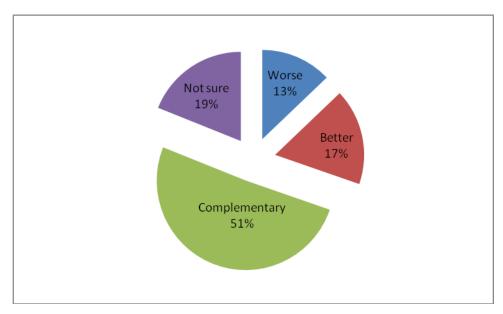
Fig 6.12 – Comparison of other sources and the library sources

Source: Researcher

6.6 Information resources

The Internet and electronic journals are the information resources that most researchers consider important. This preference is because of the diversity and currency of information which is readily provided through them. Conference papers are also considered by some researchers who view them as the source of current research going on in their areas of interest as important. Old books and print journals were proposed for removal from the library. One comment that captures this is: "they are only in the shelves to make one feel like they are in a library but they are not being used." The researchers would like more electronic information resources such as online journals and e-books. Nonetheless, there is a sizable number of senior researchers who still prefer print journals and books. Such researchers believe that books and printed journals are more credible sources of scientific information than any other online alternatives.

The researchers also expressed dissatisfaction with the information resources currently available in the library. Specifically, they said that the libraries only subscribe to the journals which are available through open access and not to the "high-end" journals which they consider as important. *Journal of Rock Science* and the *Journal of Agricultural Economics* were two of the journals identified by one such

user as important for his research projects but which were not subscribed to (more detail on this is provided on page 190).

6.7 Library usage

This section presents findings of the study on the levels, adequacy and change of usage of research libraries in Kenya. It also summarizes the factors that influence the usage of research libraries in Kenya.

6.7.1 Levels of library usage

Findings from interviews with the librarians indicate that, on average, about 200-400 users visit the case libraries each month. The librarians pointed out that this number varies greatly depending, for instance, on the calendars of the academic programmes some of the institutions are offering. The levels of use, they said, are also influenced by events being held in the institution; more people use the library when the parent institution is hosting a conference or seminar. Further, the librarians generally agreed that the levels of usage have changed. However, there was no consensus regarding the nature of that change. While some said that the change was positive because the levels of usage had increased, others said that the usage had actually reduced implying that the change was negative. Some respondents pointed out that the levels of use had increased in their libraries after they introduced computers with utilities for data analysis and free access to the Internet in the libraries. Some of the librarians said that the usage had decreased since the Internet connection at the institutions stopped working (in one case library, the Internet had not been working for almost three months at the time the interview was conducted). The usage of another library had also been affected by an improvement in a university library which had now taken up students who hitherto used to visit the research institution.

On the other hand, sixty (37%), of the researchers said they visit the library once a week while forty two (26%) said they use the libraries daily. Fig 6.13 represents the library usage. Further, sixty three (39%) of the researchers use the libraries for less than one hour on each visit while fifty seven (35%) use the libraries for two to four hours on each visit. Thus 120 (74%) of the researchers use the libraries for four hours or less on each visit. Only six (4%) of the researchers use the libraries for more than eight hours but not more than ten hours on each visit. Fig 6.14 represents the time spent by the researchers on each visit to the libraries.
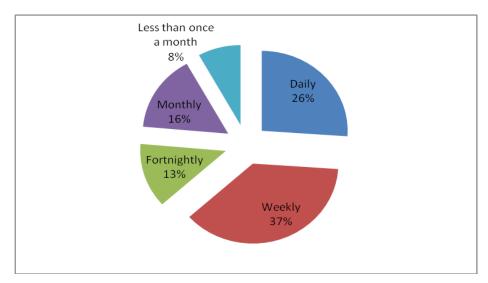
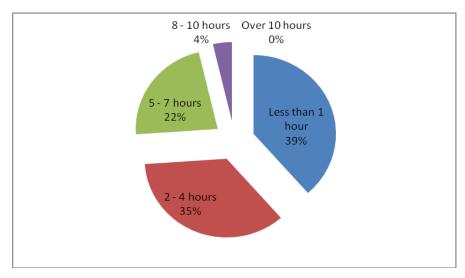*Fig 6.13 – Library usage by researchers*

Source: Researcher

Fig 6.14 – Library usage in hours

Source: Researcher

6.7.2 Adequacy of usage

Fifty (31%) of the researchers said that their usage of the libraries was adequate; forty two (26%) said it was satisfactory. Strangely, another forty two researchers (26%) said it was inadequate. Twenty one (13%) said this usage was very inadequate. Only seven (4%) said it was very adequate. Fig 6.15 represents the rating of library usage.
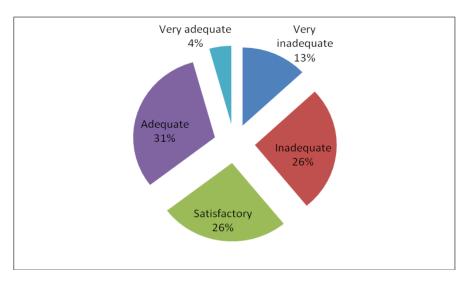
Fig 6.15 – Adequacy of library usage

Source: Researcher

6.7.3 Change in usage

Ninety nine (61%) of the researchers said that they have increased their library usage, thirty six (22%) decreased while twenty seven (17%) maintained constant levels of usage of the libraries in the past three or so years. Fig 6.16 represents this change in library usage.
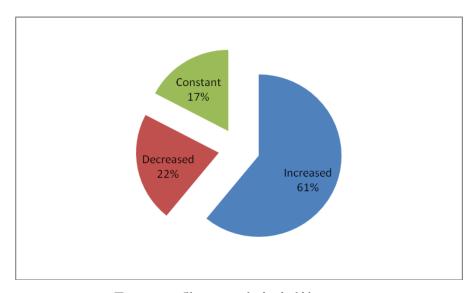

Fig 6.16 – Changes in the level of library usage

Source: Researcher

The findings also reveal that most of the researchers only use the library when they are undertaking programmes of study. Consequently, the level of usage varied depending on whether one was

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studying for a qualification or not. This fact was also corroborated by the librarians who said that most of the researchers used the library more when they are undertaking some studies or when they are writing research reports or proposals. While 107 (66%) of the researchers said that they see their level of use changing, fifty five (34%) said they would maintain the same levels. Fifty six (52%) of those who said that they would change their usage said that they increase it while fifty one (48%) said they would decrease it.

Researchers who are currently undertaking studies said they would reduce their levels of use upon graduation. Similarly, those who hoped to begin studies indicated that they would increase their library usage. Again, some of the researchers who are currently studying said that they would be going back to their countries or institutions and so would not be able to use the library. Some of the verbatim responses are hereunder:

Those who will increase usage:
1. "I will need to use it more when I start my Master's";
2. "I will go back to college and will require more reference thus use the library more";
3. "I will be doing more research and publishing hence use it more";
4. "I have just learned how to use electronic resources and will increase usage to learn more";
5. "I now have a lot of class work; I'll use it more when I have more time";
6. "I will be writing my dissertation so I will use the library more";
7. "Next year, I'll be back in school so I'll use the library more";
8. "More project funding hence more need for information updates";
9. "Likely to spend more time in the library as I build my research career"; and
10. "New research project, need for new information".

Those who will reduce usage:
1. "I am leaving the country soon so won't use it at all";
2. "I will leave Nairobi after my course so I will no longer use the library";
3. "I am completing my studies so I will not come to the library more often";
4. "I will have more responsibility at work leaving me with little time to use the library"; and
5. "I am on transfer so will not use the library well".

Critically, some researchers said that they would reduce physical library usage and instead use the Internet and other related ICTs more. Hereunder are some of their verbatim responses:

1. "Internet in the office will provide me with the necessary information";
2. "I will be able to get more information digitally and will not need a library";
3. "With technological advancements, physical library use will reduce";
4. "With technology I will not need to come to the library more often - fibre optics"; and
5. "I am likely to increase usage of Internet-based resources".

6.7.4 Factors that affect library usage

The librarians agreed unanimously that research libraries in Kenya are generally underutilized. As indicated earlier, they said that users basically come to the library when they are writing a proposal or report or when they have an assignment which requires heavy reference. The libraries supporting training programmes are normally filled by students especially during examinations. Some of the factors that the users identified as affecting usage include an inadequate collection, intermittent Internet connections, inadequate ICT tools and infrastructure (limited number of power sockets, limited Internet points for libraries that do not have WiFi, few public workstations for those who do not have their own equipment), short opening hours, crowded reading spaces during the peak seasons (examinations), poor customer care, lack of awareness of what the library offers, inaccessibility of the physical library for those who work or live off-campus, and poor image of the library as being a mere depository of obsolete unusable materials managed by disinterested and unmotivated individuals. On the other hand, the librarians said that understaffing and obsolete collections are the two most serious factors affecting library usage negatively. Other factors include competition from the Internet and a poor reading culture. Fig 6.17 shows these factors as well as how serious a problem the librarians deem them to be.

It is noteworthy that the other factors identified as very serious or serious revolved around ICT tools in the library. These included low Internet bandwidth, few computers, lack of ICT skills and software issues (lack of or problems with data analysis software).

The users suggested that the libraries should expand the reading areas, as suggested earlier; establish branches in research centres to ease pressure on main libraries; and embrace ICTs to provide library services to the researchers wherever they are at anytime. A researcher who has not been coming to a

case library recently had this suggestion: "I have stopped going to the library but I have not stopped reading; I read on my mobile phone and computer. If the [library] is to get back users like me, they have to bring the services online". But he admitted that not all users are like him. For instance, many users may not have access to similar ICT tools or the skills to use them effectively. Nonetheless, he emphasized that users like him, regardless of how many they are, should not be ignored. The researchers also suggested that the librarians should market the library services and products more aggressively and utilize public relations best practices to make the libraries more hospitable. Generally, users would like to go to a library which meets their information needs in a comfortable setting which facilitates some level of privacy during study. One user put it this way: "I'd like a little bit of a radius around me".
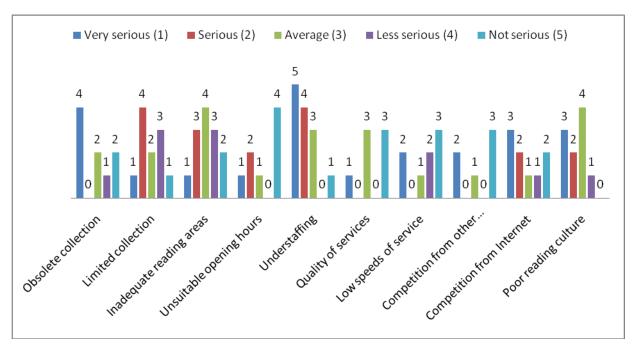

Fig 6.17 – *Factors affecting library usage as identified by librarians*
Source: Researcher

It was also suggested that new employees should be inducted in the library more effectively than the common familiarization tour. It was proposed that new research officers should spend at least one full day in the library during orientation. Some users also suggested that a national campaign should be conducted to nurture a reading culture in Kenya. They suggested that the relevant authorities and institutions should combine efforts and resources to support such a campaign. They asserted that as long as the poor reading culture still exists, libraries, not just research libraries, will be underutilized.

They also proposed that such a campaign should also involve family units so that people can begin to consider libraries as possible sites for family outings. "We take our children to watch and play games rather than to the libraries; when they grow up, they cannot be expected to be good readers," one participant quipped.

6.8 Usability of the research libraries in Kenya

This section presents the findings of the study about the factors which affect the usability of the research libraries in Kenya. Specifically, it shows the usability issues relating to customer care and library's physical space.

6.8.1 Customer service

The findings from mystery shopping and observation generally indicate that customer service in research libraries in Kenya is below expectation. Though some cases of superb service were noted, these were the exceptions to what appeared to be the norm.

The findings show that the attitude of the librarians towards users, especially new ones, is largely negative. Users were generally ignored or given scanty information on their first visit. Cases of rudeness were also reported. For instance, a case was reported where a librarian refused to show a user around the library but rudely pointed to the shelves leaving the user without any guidance on how to maximize library usage. There were also cases where the librarians did not announce library closure time; users were told to leave without warning giving them no time to wind up what they were doing. Similarly, most of the libraries do not have adequate documentation about their services. In one of the cases, the users were being given a brochure with a non-functional email address. The mystery shoppers also observed that most of the library systems are automated thus making the services relatively fast especially when there are only a few users in the libraries. However, during peak hours the speed of service slackened. Several cases where the systems crashed were also reported. These unfavourable customer care experiences, perhaps, explain the following negative comments (reported verbatim) obtained from users through focus group discussions, interviews and mystery shopping:

1. "The closing down of the library is not announced and an unaware user will only notice the librarian closing down the curtains and moving fast up and down to shut down equipment";

2. "The reception desk was unmanned and even though other members of staff had seen the user walk into the library and looking stranded at the desk, none offered to help";

3. "The librarian outwardly showed disinterest in understanding the user's needs";

4. "She [librarian] never bothered to show me around and could only point from the desk where I could possibly find the required materials…The only explanation given was that journals were arranged alphabetically and that reading space was upstairs";

5. "There was a general feeling that the librarian did not have a good mastery of the subject and her collection and this could be the reasons for the cold and ugly reception to avoid further [queries]";

6. "Service provision is slow, and the user was told to come back after one week for information";

7. "[The] attendant requested for an email address to send me the information immediately; information was sent after 2 weeks";

8. "Service provision is slow, and the user was told to come back after one week for information";

9. "The Internet and computers seemed to be down and the help given to access the database was not satisfactory"; and

10. "When I inquired about the services offered, they told me all services are offered".

However, there were exceptions as demonstrated by the positive verbatim comments below captured through mystery shopping, interviews and focus group discussions:

1. "As a new user I was given undivided attention, assistance and orientation to the library";

2. "All questions were answered in details and full explanations given";

3. "Though through a phone call, the librarian was willing to help" (the research assistant was denied access to the library because the library is strictly for users; she only managed to talk to the librarian on phone from the security office at the gate)[92];

4. "In case one of the staff was not sure of an issue, she directed me to another staff who was more familiar with such issues";

5. "Use of barcodes instead of manual cards" [accelerated the speed of service].

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[92] The researcher did not make any arrangements for the research assistants to be allowed into the libraries as this would have compromised the objectivity of the data collected. The librarians and the users, however, were aware of the general period in which mystery shopping would be done but the researcher did not disclose the exact dates or who the mystery shoppers would be.

6.8.2 Library place

Information obtained through observation and mystery shopping showed that most of the research library spaces were not conducive to research. Specifically it was observed that shelves in some libraries are dusty; some library staff members conduct personal conversations loudly at the service desks distracting library users from their work; some materials are mis-shelved; broken or unsteady chairs and tables were also observed in some libraries; some libraries' roofs leak, creating a musty environment; some reading spaces are inadequate causing crowding especially during peak times (this is especially so in libraries supporting training programmes besides research). The findings also indicate that none of the case libraries had facilities for private study or group work. It was also observed that ordinarily, the peak library hours are between 10.30am and 2.30pm. It was also noted that some of the libraries have improved spaces with comfortable lounges, adequate reading areas created by reducing the number of shelves, attractive ergonomics (soft colours, special shelves for different kinds of materials and carpeting), good lighting, ventilation and good displays.

6.9 Social Network Analysis

The researcher conducted Social Network Analysis based on co-authorship of publications between researchers in the case research institutions. He also did the same for librarians. The analysis was based on entries in the online version of the Thomson Reuters Web of Knowledge. The researcher analyzed the Science Citation Index Expanded (SCI-EXPANDED) – 1945 to present; Social Sciences Citation Index (SSCI) – 1956 to present; Arts & Humanities Citation Index (A&HCI) – 1975 to present; Conference Proceedings Citation Index- Science (CPCI-S) – 1990 to present; and Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) – 1990 to present. The searches were done on the 14th and 15th September 2010.

A search for the case organizations yielded 1,386 documents. Of these, KEMRI had the most with 461 (33%) followed closely by ICRAF with 421(30%) and ILRI at 314 (23%). KARI had 141 (10%) while AMREF had forty nine (4%). Fig 6.18 represents this distribution.
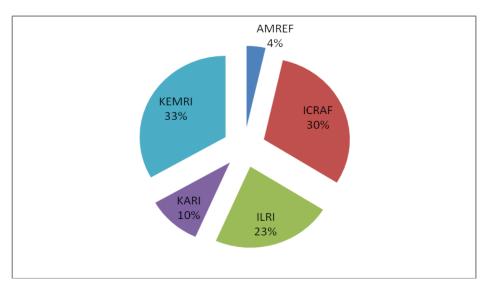
Fig 6.18 – Number of documents by organization

Source: Researcher

A search combining all the institutions did not yield any document. Searches combining four or three of the institutions also yielded no documents. Searches for KARI and ICRAF yielded two documents; KARI and ILRI yielded five documents; AMREF and KEMRI yielded three documents; while ILRI and ICRAF also yielded three documents. Other combinations yielded no documents. There were no documents co-authored by the librarians from the case libraries. The details of the results are enclosed as Appendix 6.1. The researcher used UCINET 6 for Windows Version 6.289 to analyze the data and generate sociograms. He first developed a binary matrix of the relationships from which the sociograms and other analyses were made. The full matrix is enclosed as Appendix 6.2. Fig 6.19 shows the overall sociogram representing all the relationships.

The sociogram shows two distinct networks comprised of ILRI, ICRAF and KARI – on the right – and KEMRI and AMREF – on the left. The network between KARI, ICRAF and ILRI is larger than that comprising KEMRI and AMREF. The sociogram also reveals that the University of Nairobi (UON) is a member of the KARI, ICRAF and ILRI network. The presence of the other institutions in either of the networks was nominal.

Further analysis of the years of publication of the co-authored articles revealed that the collaboration between researchers in KEMRI and AMREF network was mainly in the early 1990s with the most recent article being published in 1998. On the other hand, articles co-authored by researchers from

the KARI, ICRAF and ILRI network are generally recent with the earliest having been published in 1998 and the most recent in February 2010. This indicates that activities in the KEMRI and AMREF network seem to have reduced drastically because no article has been published by the network in the 2000s. Fig 6.20 represents this analysis. It also indicates that the KARI, ICRAF and ILRI network published most articles between 2001 and 2005.
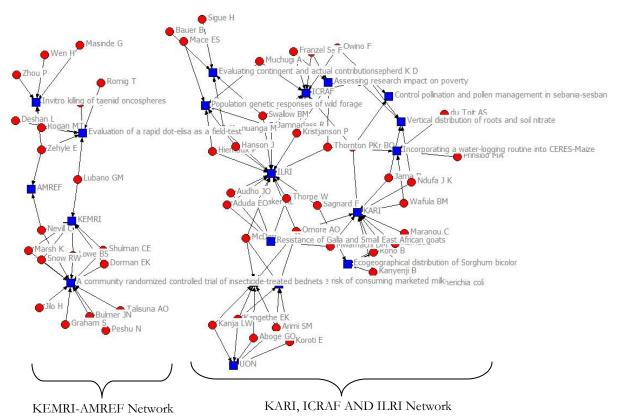

Fig 6.19 – Sociogram of the relationships between researchers and institutions

Source: Researcher

Fig 6.20 – Article distribution by year of publication

Source: Researcher

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Hanneman and Riddle (2005) define social network density as the measure of the proportion of all dyadic connections present in the network. Ehrlich and Carboni (2005) explain that social network density is a proportion that indicates the number of actual ties present in the group relative to the number of possible ties in the group, that is, if everyone had a relationship with everyone else in the group. Essentially, it is the measure of how closely connected the members of a social network are to each other. Garton, Haythornthwaite and Wellman (1997) explain that members of a densely-knit social network interact more intensively and frequently than those in a sparsely-knit network. Fig 6.21 shows the results of the density analysis of the social network in and around the case libraries using UCINET. The results show that the network density is 0.1026. This is a very low social network density which indicates that most of the members are not connected with each other. Indeed, the low interconnectivity is corroborated by an aggregation analysis (using UCINET) which shows that the researcher with the highest number of ties is Omore AO who has four ties with other researchers in the network. Most of the researchers have only two relationships. Notably, a sizable number of researchers also have only one tie. The full analysis of the number of ties per researcher is enclosed in Appendix 6.3. This shows that the researchers are loosely-knit and are not maximizing the potential benefits of the interactions within the social network.
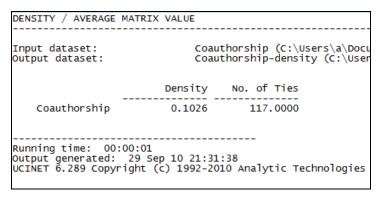
```
DENSITY / AVERAGE MATRIX VALUE
--------------------------------------------------------

Input dataset:                Coauthorship (C:\Users\a\Docu
Output dataset:               Coauthorship-density (C:\User


                      Density    No. of Ties
                   ------------- --------------
    Coauthorship        0.1026        117.0000


-------------------------------------------
Running time:  00:00:01
Output generated:   29 Sep 10 21:31:38
UCINET 6.289 Copyright (c) 1992-2010 Analytic Technologies
```

Fig 6.21 – Social network density analysis

Source: Researcher

Degree of centrality is described as the number of connections a node has. A node with a high degree of centrality is generally an active player in the network, is often a connector in the network, and is located in an advantaged position in the network (Grofman and Owen 1982; Borgatti 1995; Russo and Koesten 2005). Considering the research institutions, ILRI has the highest degree of

centrality (fourteen), followed by KARI with eleven, ICRAF with ten, KEMRI with seven and AMREF with two. Fig 6.22 represents this distribution by percentage.
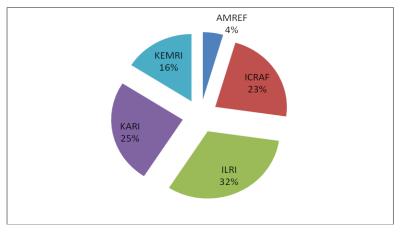

Fig 6.22 – Degree of centrality of the research institutions
Source: Researcher

Similarly, Omore AO is the researcher with the highest betweenness centrality which implies that he is strategically positioned between all the researchers and has a higher potential to influence many researchers in the social network. A similar position is also held by ILRI for the research institutions. In the KEMRI and AMREF network, Lubano GM and KEMRI hold the highest betweenness centrality. Computation of Eigenvector centrality which measures the levels of importance of a node to a social network (Borgatti 1995) also corroborates the other centrality measures by indicating that Omore AO and ILRI are the most important researcher and institution respectively in the social network. The details of these measures are presented in Appendix 6.4.

Findings from the interviews, documentary analysis and focus group discussions also showed that the libraries are currently members of various networks and consortia. These networks include Kenya Library and Information Services Consortium (KLISC), Kenya Library Association (KLA), International Association of Agricultural Information Specialists (IAALD), Kenya Agricultural Information Network (KAINET), Association for Health Information and Libraries in Africa (AHILA), Consultative Group in Agricultural Research (CGIAR) consortium, and the University of Nairobi (UON). The libraries are also collaborating with international organizations in their areas of research such as WHO (AMREF and KEMRI), Food and Agriculture Organization (FAO) (KARI, ICRAF), Centers for Disease Control and Prevention (CDC), Wellcome Trust, CTA. Most of these

international organizations also sponsor some of the research projects in the institutions. Currently, the collaboration activities revolve around sharing of resources, experiences and ideas. The researchers and librarians indicated that their institutions should collaborate with more organizations and networks.

6.10 Evaluation

This section presents findings on how satisfied the researchers are with the services and collection of the research libraries in Kenya.

6.10.1 Researchers are happy with the libraries

Thirty six (22%) of the users said that the libraries meet their current research needs very well, seventy four (46%) said that the services the libraries offer meet their present research needs well while thirty seven (23%) describe the services as satisfactory. This implies that 147 (91%) of the users are satisfied with the services as currently offered by the libraries. However, fifteen (9%) of the users said that the libraries do not meet their research needs well with eleven (7%) saying that the services are poor while three (2%) said that they are very poor. Fig 6.23 represents these views. The researchers who were happy with the library services as presently offered said that the libraries had adequate collections (diverse, current and readily available), competent staff, adequate portfolio of services, access to online journals, as well as access to online and offline databases. Those who were not happy with the services said the libraries do not have adequate information resources (quantity and diversity), and also lack requisite ICT systems and infrastructure (intermittent Internet connection and few computers) to support effective information searching, retrieval and use.

Hereunder are some of the verbatim explanations by the users on why they evaluated the libraries as either adequate or inadequate in meeting their research needs:

Positive:

1. "All articles related to biotechnology are always available either through subscription or borrowing";
2. "Most of the materials I require for my research are readily available";
3. "The library is well equipped with soft and hard copies";
4. "I have not failed to get information I needed";

5. "It has met and sometimes surpassed my research needs";

6. "Library has subscribed to adequate online journals giving adequate and current information for research"; and

7. I go to the library to look for specific information; if I don't get it there, the librarian helps me to get it elsewhere".
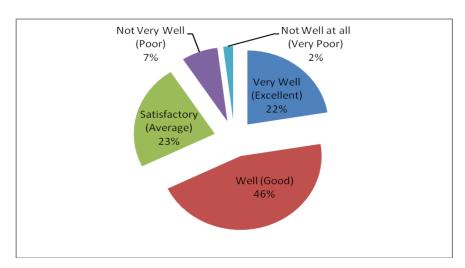

Fig 6.23 – Evaluation of how well the libraries meet research needs

Source: Researcher

Negative:

1. "Sometimes the Internet connection is poor or there's no free computer available";

2. "I supplement what the library gives with my own research on the Internet";

3. "Inadequate resources - sometimes you have to book";

4. "Bio-fuels is a new and dynamic area; the library has not been able to keep up with the dynamism"; and

5. "Most of the information I need requires subscription fees and membership, these facilities are not currently available in our setting".

On the other hand, three (19%) of the librarians said that the libraries serve the needs of the researchers very well. However, twelve (75%) of the librarians said that considering their collections, services and physical spaces, the research libraries in Kenya meet the needs of the researchers well while one (6%) were of the view that the research libraries in their current state meet the needs of the researchers only satisfactorily. Fig 6.24 summarizes these views.
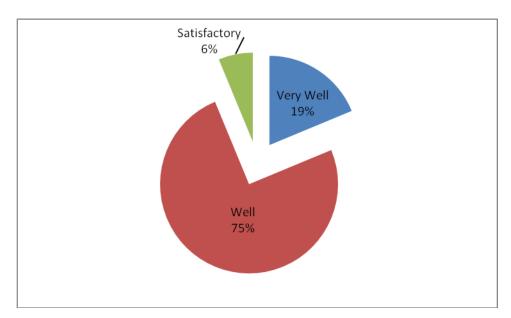
Fig 6.24 – Evaluation of how the libraries meet the needs of the researchers according to the librarians

Source: Researcher

The librarians said that this evaluation was based on the fact that they have received positive feedback regarding the services and products of the libraries from the users and that they have not registered any major complaints from the users. They, however, pointed out that the level of service in the libraries is hampered by a number of challenges as highlighted earlier. The librarians also made the following verbatim suggestions on how to make the libraries better suited to offer appropriate services to the researchers:

1. "Most researchers shy away from technology";
2. "With more resources, there is a great prospect for the library";
3. "Most libraries need to embrace ICTs if they are to remain relevant and accessible to the users; sufficient funding is needed for this";
4. "We need to adopt emerging technologies to enhance our knowledge dissemination strategy";
5. "We need more room for reading and computers";
6. "Integrate online databases using utilities such as Shibboleth[93]"; and
7. "Researchers should get involved more in the running of the library".

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[93] Shibboleth is a system for providing multi-organizational access to web resources (Morgan *et al.* 2004).

6.10.2 Journal subscriptions

One hundred and two (63%) of the researchers said that their libraries had not cancelled the subscription to journals they considered useful for their research in the past three or so years. Most of these researchers, however, clarified that the libraries had not been subscribing to many important journals in the period. Thirty one (19%) said that their libraries had cancelled important journals in the same period while twenty nine (18%) were not sure. Fig 6.25 summarizes these responses.
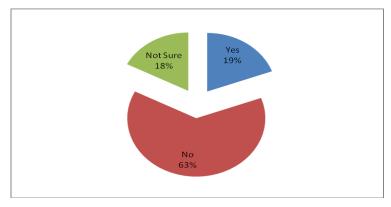

Fig 6.25 – Cancellation of important journals

Source: Researcher

One hundred and twenty six (78%) of the researchers said that there are a number of journals they consider as important for their research projects that the libraries were not subscribing to. Thirty two (20%) said that they were content with the current journal subscription. This group of users clarified that most of these journals were accessible online. Strangely, four (2%) said they were not sure. These are the researchers who said they do not use the library for research. Fig 6.26 represents these responses.
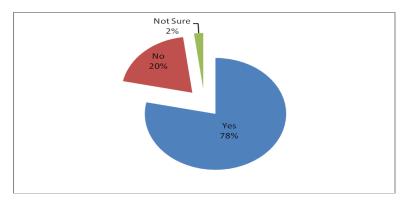

Fig 6.26 – Journals considered important and not subscribed to

Source: Researcher

Some of the journals that the researchers said they would like their libraries to subscribe to include:

1. *Journal of Agricultural Education and Extension;*
2. *European Journal of Soil Biology;*
3. *South African Journal of Plant Soil;*
4. *Journal of Mental Health;*
5. *Statistics in Medicine;*
6. *International Journal of Geographical Information Science;*
7. *Journal of Ethnopharmacology*
8. *Mycological Research Journal*
9. *Journal of Phytopathology*
10. *Plant Disease*
11. *Journal of Mycology and Plant Pathology*
12. *Journal of Horticultural Science and Biotechnology*
13. *Hortscience*
14. *Acta Horticulturae*

6.10.3 Improvement of the libraries

The researchers also said that the Internet access is the information facility that the libraries improved most in the past three or so years. It was followed by electronic journals, website, research papers, books, print journals and catalogues in that order. Fig 6.27 presents these views.

6.10.4 Interlibrary loan

One hundred and thirty (80%) of the researchers said that they have not used interlibrary loan services. Most of the thirty two researchers who said they had used interlibrary loan services rated its various aspects as good. Fig 6.28 shows the ratings. Thus, the researchers who have used this service are generally satisfied with it.

6.10.5 Libraries are important for research

Overall, seventy three (45%) of the users said that the libraries are very important for their research projects. Forty nine (30%) said the libraries are important. Thus, 122 (75%) of the researchers value the libraries. Only thirteen (8%) regard the libraries as unimportant. Fig 6.29 presents the evaluation.
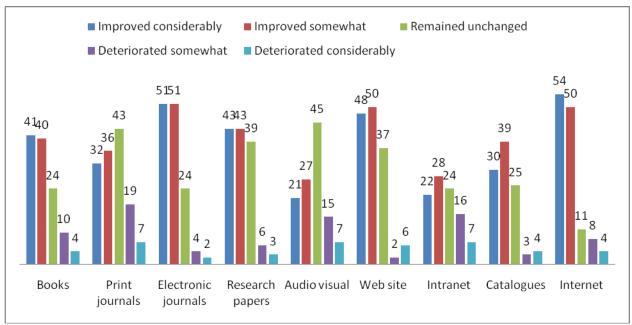
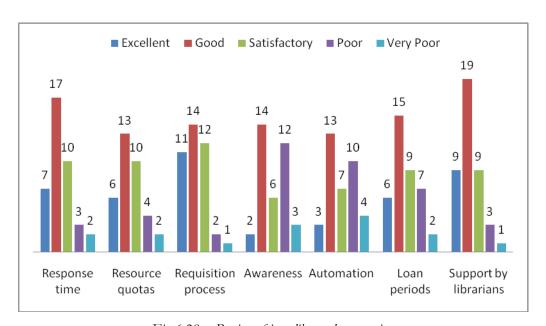*Fig 6.27 – Imrpovement of library facilities*

Source: Researcher

Fig 6.28 – Rating of interlibrary loan services
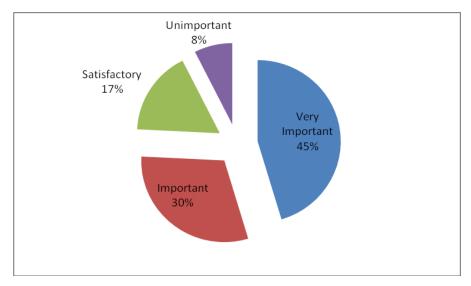
Source: Researcher

Fig 6.29 – Overall evaluation of the importance of the libraries to research

Source: Researcher

6.11 Future of Research Libraries

This section presents the perception of the researchers of the libraries as well as the changes they would like to be effected so as to make the libraries more beneficial to them.

6.11.1 Perception of the libraries

In spite of the challenges, the majority of the users perceive the libraries positively. They said that "information", "research", "ambience", "competent and supportive librarians", and "good access to the Internet and other ICT tools" come to mind when they think of the libraries. However, some researchers said that "inadequacy (funding, space, collection)", "old books", and "neglect" also come to mind when they think of the libraries. Critically researchers who perceive the libraries negatively and those who perceive them positively agreed that there is room for growth as the libraries remain important to research.

6.11.2 Changes that would make the libraries more beneficial to researchers

The researchers suggested many changes to the library physical space, services and products. It is noteworthy, however, that most of the suggestions revolved around ICTs and the Internet. For instance, they suggested that the libraries should digitize collections and services; improve the Internet connections; increase the number of public-access computers in the libraries; as well improve the capacity of both staff and researchers on the effective use of ICTs to search, retrieve

and use information for research. The users also suggested that the library physical space should be improved to make it more comfortable. Specifically, they suggested the introduction of private reading rooms which none of the case libraries currently has. Some users also suggested that the libraries should introduce some programmes during weekends. For instance, holding exhibitions of paintings was suggested as one of the programmes that would interest many research library users.
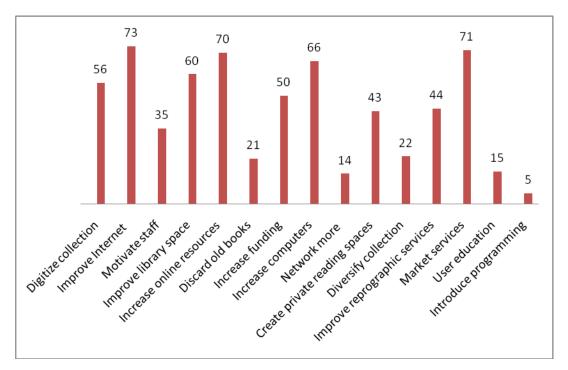

Fig 6.30 – Suggestions of how to make the libraries more beneficial to the users

Source: Researcher

Some of the verbatim suggestions are hereunder:

1. "The library needs to be more hi-tech, in the next five years everything should be electronic; supporting full multimedia complete with competent personnel so that if I have a problem then someone is there to fix it there and then;"
2. "There is need to transform the library into a modern information hub;"
3. "Avail successful proposal manuscripts that received grants;"[94]

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[94] The researchers can learn from these proposals. For instance, they can know which sponsors are interested in which areas of research as well as their preferences in terms of proposal structures and so on. Similarly, the researchers are able to tell which projects have been conducted or are ongoing in the institutions.

4. "Library staff should work hand in hand with ICT staff to enhance services and systems in the library;"

5. "The library is a critical facility that needs to be supported by the administration than is currently the case;"

6. "Have a special room with computers installed with recent statistical software for use in [research data] analysis;"

7. "Try and open the library on Saturdays as it enables researchers to continue with their work even during weekends;"

8. "The materials [should] be availed in e-format so that the users do not have to go to the library but use it from the comfort of their homes or offices;"

9. "Extend borrowing period beyond the two books for two weeks;" and

10. "Get theses and dissertations from universities within East Africa for reference purposes."

6.12 Summary

The findings indicate that the research libraries in Kenya generally meet the basic needs of the researchers. However, a number of challenges such as inadequate collection, staffing and physical infrastructure hamper their services. Though the researchers are content with the services offered, they have suggested a number of areas that need to be changed or improved to make the libraries more suited to meet their research needs. Critically, the researchers and librarians agree that the libraries need to harness the full potential of ICT tools to design and deliver superior library services conveniently and at the point and time of need.

CHAPTER SEVEN – DISCUSSION OF THE RESEARCH FINDINGS

7.0 Introduction

This chapter discusses the findings of the research study. The rationale behind separating discussions from data presentation is to give the readers an opportunity to get the objective data and make their own interpretations of the same (Neuman 2000).

7.1 Profile of the researcher in Kenya

The average researcher in Kenya is a male or female individual aged 31-50 years and holding a Master's degree. Though there are several international researchers in Kenya, these findings are generally in tandem with the educational trends in Kenya. On average, students obtain undergraduate degrees by their twenty-fourth birthday and are likely to obtain a Master's degree by their twenty-seventh birthday. Thus, such students are likely to be engaged in research as they approach thirty years of age. Of course there are exceptions to this trend. This explains the 30% who are less than 30 years of age.

It is also noteworthy that the number of researchers with PhDs is quite low. This is in tandem with the trends in most of the developing countries where the research funding and facilities are too inadequate to support the production of PhDs. These findings also corroborate the literature review on the status of research in Kenya which revealed that the environment is not able to retain senior research experts – holding PhDs – as they are generally trained outside the country and prefer to remain there because of favourable career development and job opportunities (Wambalaba 2007; Ochola and Gitau 2009). Similarly, given that the research sector in Kenya is still in its infancy, it cannot accommodate many senior researchers in its present state (Oyugi and Kibua 2008). Although the extent of lack of PhDs varies in most sub-Saharan countries, the situation has caught the attention of many stakeholders. Consequently, a number of programmes have been initiated to remedy the situation. Some of these initiatives include the African Doctoral Dissertation Fellowship (ADDRF) supported by the International Development Research Centre (IDRC) and the Ford Foundation; the Consortium for Advanced Research Training in Africa (CARTA) coordinated jointly by the African Population and Health Research Centre (APHRC) in Kenya and the

University of the Witwatersrand in South Africa; and the African Women in Agricultural Research and Development (AWARD) which supports the training of women researchers in agricultural sciences. Though these initiatives are commendable, more efforts are still required to train, attract, equip and retain senior researchers in Kenya and other developing countries. For instance, the Government of Kenya (GOK) should set aside adequate research funds to support research activities in the country (Oyugi and Kibua 2008).

Another important matter relating to the age-bracket of the average researcher in Kenya is the fact that they are likely to use the research libraries for many years because they are relatively young. It also implies that they are also fairly adventurous and are likely to experiment with and be more receptive to new ICTs. Consequently, the research librarians in Kenya should strive to stay ahead of them by embracing new techniques and tools for delivering library services. Otherwise, researchers will not find the libraries useful for their research projects. It is also important to note that given most of the researchers are relatively young they are still working to develop their careers. The young researchers are also most likely to face stiffer competition for funding and reputation from their senior counterparts. These researchers need more support promptly, aptly and conveniently from the librarians to identify, access and use research information that supports their interests. As Railiene (2005) observed, timeliness of research is very critical as the first announcement of research results often reduces the value of similar research studies.

7.2 Profile of research librarians in Kenya

On average, the research librarian in Kenya is below 40 years of age and holds a Bachelor's degree. The relatively high age-bracket is explained by the fact that some of the librarians obtained Diplomas in Librarianship before undertaking undergraduate studies. In the context of this research, this profile is advantageous because it implies that most of the librarians are within the age-bracket generally perceived to be receptive to change. Thus, the librarians are best suited to steer the changes necessary for the libraries to adopt new techniques and tools of delivering library services.

Critically, it is noteworthy that the librarians and researchers are generally within the same age-brackets though the latter generally have higher educational qualifications. This similarity of profile implies that the researchers and librarians can work together easily in developing systems that would ensure that the libraries meet the information needs of the researchers better. However, there is also

a probability that they may not work together easily because they may look down upon each other. This negative probability should be managed carefully so that they may develop a team spirit founded on mutual respect and recognition of the fact that none of the parties can contribute to the realization of the mission and vision of the institutions alone. Indeed, the need for researchers and librarians to collaborate in the process of research is emphasized in most literature reviewed (Kent, Lancour and Daily 1978; Salvesen 1999; St. Clair, Harriston and Pellizzi 2003).

Three of the case study libraries are headed by librarians who hold Bachelor's degrees. The same librarians also hold ordinary Diplomas in Librarianship. Given the demands of their responsibilities, the head librarians ought to have at least a Master's degree. Some of the librarians also hold specialized training in the areas of research of their institutions such as Agriculture, Botany and Biological Sciences. It is also worth noting that two of the head librarians of the case study libraries are currently pursuing PhD studies. Salvesen (1999) suggests that a high level of education is important if the librarians are to engage the researchers more effectively and acquire a favourable position in the organizational structure. Graduate training would also equip the librarians with research skills to enable them to undertake their own research projects which may not only yield better recognition but also attract more funding.

Though there is no major gender imbalance amongst the librarians, it is noteworthy that all the five case libraries are headed by female librarians. This finding seems to lend credence to the notion that the librarianship profession attracts more females than males. Indeed some research studies have concluded that librarianship is dominated by females with some putting the ratio at four females to one male (Carmichael 1992; Goodson 2008). Carmichael (1992) also conducted a survey that revealed that male librarians in North America face more challenges than their female counterparts. He said most of these challenges emanate from stereotypes, one of which was that male librarians are gay and effeminate. Other stereotypes portray male librarians as socially inept, lacking ambition and failing in other fields of endeavour (Piper and Collamer 2001; Goodson 2008). These views above and the findings of this study seem to contradict those of a study conducted by Majanja and Kiplang'at (2003) which found that the position and remuneration of women librarians in Kenya is consistently lower than their male counterparts. A similar study conducted by Nwezeh (2009) in Nigeria concluded that the status of women librarians in Nigeria is not under threat in terms of remuneration and position. Nonetheless, the apparent domination of librarianship by females in

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Kenya seems to be changing because three of the head librarians are deputized by males with only two deputized by females. Significantly, most of the male deputies handle technological functions in the libraries. This finding is in agreement with some studies which have also confirmed that the number of male librarians is increasing with most of them taking up the technological positions in libraries (Hildenbrand 1999; Greer, Stephens and Coleman 2001). Further study on this topic is necessary to paint the real picture of the gender issue especially in Africa.

7.3 Membership of the research libraries in Kenya

The findings indicate that students use the research libraries most. Most of these students stated that they will stop using the libraries when they complete their studies. Of course, the students generally use the libraries to support their academic research interests. This trend is disturbing because it seems that the libraries are not used for mainstream research in the institutions. There is an urgent need to mainstream the libraries in the research processes in the parent institutions. The research librarians ought to be more proactive and demonstrate the value of the libraries to the research interests of the institution. One way of entrenching libraries in research is by enriching the services and making them conveniently accessible.

Generally, library membership has reduced in the past three or so years. It has only increased where more courses or projects have been initiated. Though most non-members would like to join, it is noteworthy that a large proportion (30%) said they would not like to obtain membership. The libraries which have registered an increment in the membership have recently introduced cybercafé services. Evidently, most of the users have been attracted to the libraries to use the ICT tools and not necessarily to use the library collection and services. These findings are in tandem with the general global trends which indicate that a sizable portion of library users are forfeiting membership and opting for other sources of information (OCLC 2005). It is critical that research libraries devise ways of attracting new users and retaining the current ones. There is no better way of doing so than that of fitting the library services and products into the emerging lifestyles of actual and potential library users (Jörgensen 2005; Aiken 2006). At this moment, most of the library users are embracing ICTs (Lynch 2000). Therefore, libraries may have to follow this trend and develop services that ride on this wave.

It is gratifying to note that some of the libraries have already begun improving their services and products especially through ICTs. However, the improvements should be made carefully to ensure that the users are not just attracted to the libraries to use ICT resources for purposes that do not support research efforts in the institutions. Critically, these improvements should target the researchers working on core projects in the institutions. Librarians should also strive to invite and integrate suggestions of the users on what they (users) would like to have in the libraries and how. The librarians do not have to offer all services as requested by the users; they can apply their own professional discretion in deciding what to prioritize. However, care should be taken so that the users are not upset when suggestions that they consider important are not implemented as this can be counterproductive.

7.4 Strategic planning for research libraries

None of the case libraries had a documented strategic plan. Instead, they were guided by the corporate strategic plans of their parent institutions. Unfortunately, the corporate strategic plans make nominal mention of libraries and do not provide adequate details on the goals the libraries ought to achieve and how. The situation is exacerbated by the fact that most of the librarians do not participate actively in the development of these corporate plans. Even in cases where head librarians attend institutional strategic planning sessions, their participation is limited because they are normally outnumbered by the more numerous and vocal researchers in the planning teams.

The role of a strategic plan in facilitating the achievement of library goals cannot be overemphasized. Lorenzen (2004) argues that appropriate strategic plans enable the libraries to budget; anticipate, catalyze, prepare for and manage change; manage competition; harness and channel resources in the right places; and direct improvements to the library services and products. Powers (1995) also explains that strategic plans enable libraries to develop unique cultures. She also suggests that the unique cultures of successful special libraries can actually influence the corporate cultures of their parent institutions. Robinson and Robinson (1994) explain that strategic plans also enable libraries to prioritize activities and justify their existence by demonstrating their value to the parent organizations. Thus, it is evident that effective strategic planning helps improve the services of research libraries (Powers 1995). Kaarst-Brown *et al.* (2004) argue that libraries that do not have effective strategic plans are in danger of being rendered irrelevant and even closure because of the increasingly hostile external environment in which they operate. Therefore, it is incumbent on all

research libraries in Kenya to develop and deploy appropriate strategic plans. It is encouraging that the librarians in all the case study libraries said that their libraries are likely to develop strategic plans in the next one year or so. Again, the participation of the researchers should be solicited effectively in this process so as to accommodate their interests and also to win their support.

7.5 Role of the research library

The role of the research library, to support research activities in the research institutions, is clear to both the users and the librarians. There is also consensus that research libraries in Kenya, by offering basic library services only, are currently not playing this role effectively. This situation has been attributed to many factors, key among them are inadequate funding and understaffing. In light of the findings, the librarians are being urged to assert themselves in the research value chain by creating a viable niche for themselves. Similarly, they are being urged to move beyond the mere provision of a library collection and physical space. Instead, they are urged to focus on enabling the users to interact effectively with the library products and services through strategic customer care and support. So, while the role basically remains the same, it is evident that how it is played has to change. For instance some users have suggested that the librarians should focus more on empowering the users, for instance through user education, to enable them to conduct their own searches.

It also emerged from the findings of the study that research libraries should not just strive to support the users' research needs only. The users particularly emphasized that the libraries should meet all their information needs, for instance, by including general information resources such as *Reader's Digest* in the collection. Whereas some of these information resources may once in a while have some research value, the bulk of their content provides general knowledge information meeting needs which go beyond research. They provide information on current affairs, personal health, fiction and entertainment, among others. This also explains why some of the researchers insisted that newspapers and magazines, though not critical items for research, are still necessary elements of any typical research library collection.

Marketing of library services is also emerging as an important determinant of how effective the research libraries play their role. Currently, the libraries seem to be waiting for users and, to a large extent, only offering what the users ask for. Consequently, there is some gap between what the

researchers know they can get from the libraries and what the libraries have the potential for or are actually offering. Whether they are managing organizational knowledge or creating a platform for interaction for researchers, the fulfilment of these research library roles largely depends on how well the users understand the services and products of the library and are facilitated to use them. Outreach to the users by the libraries is of paramount importance now more than ever given the existence of several alternative sources of information which compete with the libraries for the users. As one of the users said during the interviews, "times have changed and the Internet poses a real challenge because users will only come to the library if they know they can get services which are better than or on a par with what is offered by alternatives." Adeyoyin (2005) supports this view and states that, recognizing the socio-economic and technological changes around the libraries, strategic marketing of library services and products is now more critical than ever. He suggests that libraries should conduct vibrant and dynamic marketing campaigns to increase the users' awareness of the library services and products as well as educate them on how to make the best use of the library.

There is disagreement between the head librarians and their subordinates as to how well the research libraries have played their roles. While the head librarians are of the view that the libraries have played their role well, the middle-level librarians disagree. It is not easy to make a judgment about this difference of opinion, because both parties may be reasoning from different points of view and, to that extent, could be right in their own way. For instance, the head librarians, as the strategic team leaders, are likely to understand the roles of the libraries better than their juniors. Consequently, they are better placed to evaluate how well the role is being played. On the other hand, the middle-level librarians are the ones who interact more with the users, that is, they are the people on the "shop floor". They are the ones who ordinarily receive requests, complaints and commendation from the users. They also observe the researchers' frustration or satisfaction with the library services, products or processes. In this regard, they are also better placed to assess how well the libraries play their role. It is also possible that the head librarians' response was "political" in the sense that they did not want to indict themselves as this would mean that they have failed in their duties. Of critical importance, however, is the fact that most of the users were of the view that though the libraries have made remarkable efforts to play their roles effectively, there are several areas in which a lot more still needs to be done to enable the libraries to support the researchers better.

Another pointer as to why the research libraries may have not played their roles well is the lack of adequate participation of the users in decision making in the libraries. This lack implies that the library services and products are generally conceived by the librarians with little or no contribution from the users. Expectedly, this approach is more likely to result in services and products that meet the interests of the librarians and not the users. The libraries need to change this approach urgently and invite and harness the involvement of the users in determining what and how they are served in the libraries. In light of the socio-economic and technological changes the society is currently witnessing, involvement of users in the management of the library cannot be overemphasized.

7.6 Models of library service

Most librarians are not aware of the library service models that are applied to their own libraries. It seems that these models are not taught in the schools of librarianship. It also seems that little research has been done in this area. So the models currently employed are not governed by any fundamental principles and are not based on critical analysis and comparisons to ascertain what would work better in different contexts. It seems that the research libraries are basically copying from each other. More research is needed in this area. The researcher suggests that the Kenya Library Association (KLA) should dedicate one of its annual conferences to this topic as a way of stimulating research in the area. The researcher also suggests that schools of librarianship in Kenya and elsewhere should include this topic as a subject in their curricula.

The librarians were very interested in Library 2.0 when the researcher explained its principles to them. This positive reception may have been caused by their need for a model to guide the digitization and other ICT-facilitated changes they are currently implementing or considering in the libraries. They agreed that Library 2.0 holds great potential for enriching and expanding the reach of the services and products in research libraries. Nonetheless, they pointed out that some of the principles of the model such as "the library is everywhere" may not be easy to achieve given the immense challenges that the libraries currently face. Further, they explained that it may not be in the interest of the research libraries to take services where their users are not.

7.7 Library services

As expected access to the Internet and online information resources are the most popular and important service currently offered in research libraries. The main motivation for Internet-based

services is convenience and timeliness of use. Convenience of library services is considered important by many users as echoed by one participant during the focus group discussions for users who said: "I need to get information wherever I am at whatever time; the library should be able to meet my needs from where I am when the need emerges." This statement corroborates the findings of OCLC (2005) that library services characterized by convenience and availability are now as important to the users as the quality and trustworthiness of the products.

It is also noteworthy that most of the complaints about library services revolve around the Internet. This finding may be an indicator of the fact that librarians may not have given this most-valued library service the due consideration it deserves. It seems that the libraries are not investing adequate resources to enhance their Internet connections. Knowing the general technological and other trends in the research library ecosystems, the libraries need to invest more in providing safe, reliable and fast Internet bandwidth. Apart from the infrastructure, adequate attention should also be given to the content. The most common trend at the moment is to empower the users to contribute content through Web 2.0 tools such as blogs, Slideshare, Facebook, social bookmarking and tagging, among others. The libraries should also invest in leveraging the ICT skills of both the librarians and users to enable them to make the best use of these emerging tools.

Against all expectations in a technologically-charged environment, the need for reprographic services seems to emerge strongly. Similar results were obtained by Singh and Garg (2002) from another study from the Southern hemisphere on reprographic services offered by biomedical libraries in India. Several complaints were registered against the high costs of printing and photocopying or lack of such services. Appreciation was also registered where the services were offered affordably or free of charge. It is evident, therefore, that research libraries cannot stop offering these services. In the early 1990s Morgan (1993) asserted that photocopiers are now regarded as one of the essential items of equipment in a library. Given that most of the research libraries are understaffed reprographic services should be offered using systems and machines that are less labour-intensive such as coin operated photocopiers which facilitate self-service. The researcher also suggests that in cases where the library faces challenges in offering these services, they can be outsourced and may be offered as part of a mini stationery shop in the precincts of the library. Where there is no cafeteria nearby, such shops may also serve snacks and refreshments to expand their revenue streams. Esezobor (1971) and Rangra (1989), however, caution that the

libraries should be careful not to infringe the copyright of the authors of the copied works. The decision on whether to charge for reprographic services or not is left to the libraries though many people suggest that the services should be offered free of charge especially in institutional libraries such as the research libraries (Rangra 1989; Singh and Garg 2002). Historically, reprographic services used to serve a preservation role in which only copies of originals were circulated to ensure longevity (Hutton 1988). The service may still be playing this role to a small extent in some types of libraries. In research libraries, however, the focus is not on ownership of items but access to them. Therefore preservation ceases to be a major concern.

Interlibrary loan services were not popular with the researchers except in one case library where nearly half of the respondents said they had used the service and assessed it favourably. Critically, this case library had not digitized its services and collection adequately. Further, the library had embedded mini-libraries in research centres that constantly shared resources. All the same, it seems that if the interlibrary loan service can be streamlined and automated it can attract more users. There was consensus that no single library can hold all the information resources needed by its users. Further Boucher (1997) suggests that the exchange of unpublished information sources such as reports or conference proceedings which may not be available through other means is important for research libraries. Boucher (1997) also proposes that in light of the widespread adoption of ICT tools in libraries, interlibrary loan services should be delivered digitally and should go beyond the mere exchange of information resources to encompass library experiences as well. These findings are in tandem with those of other studies which have indicated that though interlibrary lending is an important service in research libraries, the demand for it has declined since the emergence or electronic resources which are considered to be more convenient, affordable and fast (Gunasekara 2005; Missingham and Moreno 2005; Beaubien 2007).

There are some services that are discernible from the literature review as typical of research libraries which research libraries in Kenya do not seem to offer. One such service is citation management. Le Rox and Burke (2008) explain that even though referencing of articles is the sole responsibility of the researchers, research librarians are steadily getting involved in the collection, formatting and maintenance of references. McGeachin (2004) and Eysenbach and Trudel (2005) suggest that the librarians may utilize specialized software such as Refworks or Endnote in this role and also train the researchers to use the software to manage their references. None of the case libraries currently offers

this or any similar service. A related service which would also add value for the researcher is tracking the citations of the works they publish as a way of ascertaining the impact of their research projects. As Hoskins (2009) explains, the impact of research projects is commonly evaluated based on the quantity and quality of publications emanating from them.

The findings also reiterated that librarians play an important role in facilitating the delivery of appropriate library services to the users. How well the librarians play this role is a product of many factors. However good a library's facilities and collections are, its services will still be below expectation if the librarians' services are inadequate. Incompetence and poor customer relations are some of the "librarian-related" factors that the researchers said jeopardize the delivery of effective services to the library users. It is imperative that where these and other factors exist, the concerned authorities should address them promptly to ensure that the librarians do not become a hindrance to the effective use of the libraries. This could be done through retraining and other forms of motivation, among other strategies.

7.8 Other sources of information

Generally, researchers look for the information that they do not get from their own libraries from the Internet or other libraries. Several studies (Chad and Miller 2005; Jörgensen 2005; OCLC 2005; Aiken 2006) have showed that many library users are reducing their reliance on libraries and are instead depending more on Internet sources. So, it is noteworthy that the findings of this study indicate that several researchers are using other libraries to supplement the services and resources they receive from their own libraries. This finding indicates that the libraries are still relevant and that users still find value in them. The situation would have been grave if the researchers had said that they get information which their own libraries do not have from sources such as the Internet and not other libraries. It is also worth noting that they also said that the information so received is generally complementary to what is accessible from their own libraries. This finding implies that the researchers generally rely more on libraries for their information needs than the other sources which they only use to supplement what the libraries have.

It is also noteworthy that most of the "other" libraries mentioned in this study are research libraries. This also confirms that research libraries are crucial for research. A number of academic libraries were also mentioned as sources of supplementary information. Thus, the findings also indicate that

academic libraries also have great potential in supporting research. It is therefore critical that research librarians should develop linkages with the academic libraries in universities offering programmes in their areas of interest. For instance, KARI, ILRI and ICRAF can establish linkages with the University of Nairobi's College of Agriculture library or the Jomo Kenyatta University of Agriculture and Technology (JKUAT) library. Similarly, KEMRI and AMREF can network with Aga Khan University and University of Nairobi medical libraries.

7.9 Library usage

There was agreement that the research libraries in Kenya are underutilized. Only researchers undertaking various courses use the libraries frequently. Some of the factors identified as causing the low usage include opening hours, proximity, poor marketing and the poor information literacy of potential users. Undoubtedly, this usage needs to be increased if the libraries are to remain relevant. This researcher suggests the following activities to improve library usage:

Table 7.1 – Suggestions on how to improve the usage of research libraries

Source: Researcher

Activity	Desired Impact
Undertake aggressive marketing of library products and services.	Increased understanding of what the library can offer and how to get it hence increased contact with the library.
Embrace ICTs to offer services anywhere at all times.	Extended, fast and convenient delivery of library services and products to users at the point and time of need.
Offer elaborate, incremental, well-targeted and continuous user education.	Improved capacity of the users to self-serve and make the best use of the library.
Improve the physical and social library space.	Frequent and extended use of the physical library facilities and services.
Involve the users constantly in decision making in the library.	Higher ownership of the libraries and relevance of services and products hence higher use and attachment.
Include programming.	More users will be attracted to attend the programmes and in the process will develop psychological relationship with the library which can translate to enhanced usage.
Embrace liberalism in designing and delivering library services.	Delivery of the services and products using non-conventional channels and thus ensuring that many potential users are reached and served.
Increase opening hours including weekends.	Increased time for the researchers to use the library outside the working hours; as a result more researchers are likely to spend more time in the library.
Embed mini-libraries to the far-flung research centres.	Improved proximity and access to the physical library.
Enrich the collection.	Unique, current, appropriate and diverse content attracting more users because of the value thereof.

7.10 Library space

The findings indicate that library physical spaces in research libraries in Kenya are not conducive for research. The inappropriate physical state of the libraries partly explains why some researchers no longer go to the physical library. As discussed in the earlier chapters of this thesis, researchers do not treat physical library space as a mere repository of information materials from which these items are borrowed and/or used. Conversely, they consider the library as a place to work, get help on various issues relating to their projects, meet other researchers and consumers of research, and celebrate research (Leighton and Weber 1999; Cannell 2007; Steele and Walters 2007). Consequently, the research library space should have ample and comfortable seating; special attractive areas where researchers can collaborate, eat, drink, or talk that are fun to work in. Most research libraries in Kenya need to work harder to improve their physical spaces. The inappropriateness of the physical spaces is partly attributable to the fact that very few of these libraries, if any, were custom-built. Nonetheless, they need to be spruced up, re-arranged and re-equipped in tandem with the changing needs of the users for more space, comfort and collaboration. One of the possible short-term strategies in remodelling the spaces is to reduce the shelf space through weeding and digitization of the collection.

The fact that the researchers raised issues relating to physical space indicates that they are still interested in the physical library space. The researchers said that they use the space more when they need to concentrate and escape from their offices, which are generally open space. The libraries should, therefore, not ignore their physical space issues. It is likely that improving these spaces may attract more users into the library. Table 7.2 provides suggestions on how to improve the physical space in research libraries.

Table 7.2 – Suggestions on how to improve the library's physical space

Source: Researcher

Issue	Action
Comfort	Upholstered seats, firm furniture, lounge seating, general ergonomics such as seats with good backrests and height.
Privacy	Private reading rooms, sizable carrels, seating arrangements to reduce crowding.
Space	Weeding of the collection; reduction of shelf area; expansion of the libraries; embedding specialized libraries in research centres; digitization of collection and services.
Quietude	Prohibit telephone conversations in the reading areas, basic noise proofing (acoustics) and carpeting, separate "loud" places such as photocopying areas from the "quiet" places.
Ventilation	Artificial air conditioning and adequate ventilation openings.
Lighting	Adequate number and intensity of lighting systems, light filtration to reduce glare where necessary, ample glass window area for natural lighting, and adjustable task lighting where appropriate.
Navigation	Use of conspicuous signage, logical physical arrangement of the facilities.
Cleanliness	Dust and dirt free environment; provision of dustbins where appropriate; walls painted with cool colours.
Collaboration	Provision of group work areas with appropriate furniture and technological tools.
Refreshments	Availability of "coffee shop" or gift shop nearby; vending machines; and water dispensers.
Workspace	Facilities that enable users to plug and use their own equipment such as wireless Internet hotspots; adequate power sockets; space large enough to store basic items for work.
Entertainment	Audio-visual facilities; television set with DSTV service; video games; and piped music where appropriate.
Help	Helpdesks within the reading and reference areas where users receive reference and other support for tools such as ICTs.
Production	Productivity tools such as camcorders, headphones with microphones, digital cameras, Liquid Crystal Display (LCD) projectors, whiteboards, flipcharts, additional power cables, scanners, printers.
Disability	Provision of access ramps, elevators/lifts or wheelchairs where appropriate.
Utilities	Clean restrooms, wall clocks, bank facilities such as automatic teller machine (ATM).

7.11 Information resources

The research findings indicate that the researchers generally prefer electronic information resources. This is mainly because such resources are perceived to be more up-to-date than their print counterparts. Further, the electronic resources can generally be accessed faster. Given that the resources are not formatted to be accessed sequentially, most researchers find them easier to use.

The librarians are already aware of this preference and are making efforts to increase the volume and diversity of electronic resources in their collections. The preference for electronic sources implies that most of the researchers conduct their own searches, evaluate sources and retrieve information they find useful. This behaviour has been described by some researchers as self-sufficiency (Grefsheim and Rankin 2007). Self-sufficient users require more capacity development from librarians to enable them to sift the huge amounts of information available in cyberspace effectively but once trained these users can operate fairly independently. However, it seems that research libraries in Kenya do not offer meaningful user-education on the use of electronic sources, and especially the Internet. This scenario can be partly attributed to the fact that most of the librarians themselves need help with ICTs. Further, some libraries lack adequate ICT infrastructure to facilitate such empowerment. In such libraries, the researchers basically use their own equipment in their offices or homes making it hard for the librarians to offer the support. Similarly, most of the libraries lack integrated sites from which researchers can search several databases at once. Some librarians suggested that using Shibboleth to enable the researchers to conduct integrated searches on multiple databases would be valuable. None of the case libraries have deployed any such facility so far. The fact that most researchers seem to be self-sufficient does not mean that they do not need assistance. It is incumbent on the librarians to devise strategies on how to respond to this unmet need of the researchers.

As expected, researchers consider electronic peer refereed journals as the most important information resource for their projects. These results mirror those of similar studies. For instance, Grefsheim and Rankin (2007) conducted a study on the information seeking behaviour of biomedical researchers and concluded that online journals were their single most important information resource. Similarly, a study by Glesson (2001) confirmed that scientists consider electronic journals as their primary source of research information. Brown, Lund and Walton (2007) conducted a survey at Loughborough University which confirmed that electronic journals perform an increasingly important role in research which engenders an ever increasing demand for new titles and back-runs. Brown, Lund and Walton (2007) also explain that researchers prefer electronic journals over their print counterparts because they are more effective in providing access to a greater number of serial titles than is possible with print journals; providing remote access to the information resources saving the researchers time; and providing greater search power in locating information. Consequently, research libraries should invest more resources in making as many

electronic journal titles as possible accessible to their users. Unfortunately, the researchers said that there are several journals that they consider as important for their current research interests which their respective libraries do not subscribe to. The researchers and librarians also suggested that the best strategy to access a wide array of journals, given the challenges relating to underfunding, is through diverse collaboration arrangements between libraries. The librarians explained that it is this realization of the need of collaboration which led to the formation of the Kenya Library Information Service Consortium (KLISC) which they reported has been helpful in spite of its myriad challenges. Thus, streamlining of KLISC and establishment of other collaboration networks has the potential of improving the services of the research libraries and bolstering their place in research. It may also be useful for the research libraries to develop their own unique networks to facilitate sharing of this most-valued information resource.

The research findings also indicate that grey literature such as minutes of specialized meetings, government documents, conference proceedings, working papers, newsletters, fact sheets and bulletins are also emerging as critical sources of information for researchers. The researchers explained that these sources provide glimpses of research trends even before the formal publication of results. They also said that grey literature provide background information such as statistics, facts, overviews and research summaries which are important for research (Weintraub 2000). Stock and Schöpfel (2003) explain that managing grey literature is complex. They identify the major challenges to be related to distinguishing the useful grey literature from the rest, and copyright issues. Even where the grey literature has been collected, cataloguing it is not easy given the diversity of form and subject areas. Nonetheless, Weintraub (2000) emphasizes that grey literature is becoming a popular source of scientific information which complements what is published through scientific journals. In spite of its growing popularity, most libraries, including all the case libraries, do not have concrete strategies for dealing with grey literature. Librarians therefore should now consider this literature as important elements of their collections and should work to collect, organize and make them available to the researchers. Such literature can be disseminated through institutional information systems such as Intranets which can then respond to the wish of the users for a local "Google". Libraries should also formulate mechanisms of sharing this literature with similar libraries either physically or digitally.

Though the demand for printed books by researchers is steadily reducing, a number of researchers still consider physical books as important especially for background research and reference. Furthermore, the researchers pointed out that some important government policies and reports are only available in hard copy. Expectedly, most of the researchers who expressed a liking for print resources are senior researchers who hold the view that the credibility of information published in printed books cannot be compared with that of the electronic sources. As the librarians work to keep physical books on the shelves, it is noteworthy that the cost associated with this effort is higher than obtaining access to electronic information resources. Whereas the current trend is that research libraries are maintaining a hybrid of print books and electronic resources, the libraries are likely to gradually reduce the size of physical books they hold. Franklin (2007) argues that this trend is motivated by a shift in collection policy in research libraries which now focuses more on intangible than tangible resources. Lougee (2002) supports this view and adds that research libraries are steadily embracing collection development approaches that focus on access rather than ownership. Hoskins (2009) also explains that in this new collection development paradigm, the role of the librarian has shifted from being the "keeper of information" to "facilitator of access to information". From the foregoing, it is not possible to envision a future of research libraries which do not hold print books in their collections. Nonetheless, it is evident that if the trends persist then the volume of printed books held by research libraries will reduce drastically in the near future.

There was no consensus on the value of newspapers as sources of research information. Nearly similar number of researchers said that the value of newspapers to their research is average or very unimportant. The value of newspapers seems to be provision of general news and public opinion on areas of research interest. However, Hijmans, Pleijter and Wester (2003) conducted a content analysis of Dutch newspapers and found that they dedicate a sizable space to scientific research. They explained that the newspapers reported the background and methodological aspects of the research studies covered. Entwistle (1995) also avers that newspapers are important sources of scientific information. Whilst some librarians suggested that research libraries should stop providing newspapers as it only attracted "idlers", some researchers asserted that newspapers are important and suggested that the libraries should not only hold the current issues but also the back issues as well. One researcher also suggested that researchers should obtain corporate subscription to online editions of leading newspapers in Kenya such as *Daily Nation* and *The Standard*. The researcher explained that apart from reporting simplified versions of research findings for lay people, the

newspapers also provide information which is critical for assessing the impact of research projects especially where the primary beneficiaries are members of the public. Newspapers can also influence research agenda through hyping and priming of reports on issues of research interest. From the foregoing, it seems that newspapers will remain part and parcel of research libraries. It is not possible to predict which form – digital or print – newspapers will be provided in libraries. However, based on the existing trends, more are likely to be in digital than print editions. It is incumbent on libraries to explore the best strategies to maximize the potential of newspapers to provide research information.

7.12 Customer service

Miao and Bessham (2007) define customer service as an organization's ability to consistently meet the needs and expectations of its customers. They also explain that over the years, libraries have adopted customer service strategies from the business sector. Bernstein (2008) argues that good customer care is what will keep librarians and libraries relevant in a fast changing world. He explains that a library is a mere warehouse without good customer care and asserts that good customer service will not only enable libraries to survive but also to thrive. Critically, Bernstein (2008) identifies elements of good customer service in a library as facilitated by a positive attitude, thorough product knowledge, courtesy, solution orientation, communication, coordination, proper delegation, service personalization, change management, and professionalism.

Davenport Public Library (2005) in Iowa in the United States lists library customer service standards which include taking responsibility for upholding the freedom of information rights of the library users; knowing, understanding and implementing library policies; being at one's station when scheduled; creating a cooperative work environment; respecting all customers and colleagues; creating a welcoming atmosphere in the library; making each customer's call or visit to the library a high quality experience; meeting the needs of customers; verifying with customers or co-workers that their needs have been met; avoiding communicating personal value judgements when interacting with customers and co-workers; providing service to the customer above all personal activities or interests; and being knowledgeable, courteous and responsive in all forms of communication with customers and co-workers. Other scholars and practitioners such as Miao and Bessham (2007) and Tyerman (2008) also recommend observing etiquette scrupulously when dealing with library users; having customer friendly systems and staff; commitment to excellence; active

customer involvement; and reliability as some of the core elements of good customer care in a library.

Placing the findings of the study against the above standards and best practices, it is evident that customer service levels in research libraries in Kenya generally do not meet the expectations of the users. Information on elements of customer care obtained through mystery shopping, focus group discussions and interviews revealed that though some research libraries in Kenya have good customer service, several others do not. Cases of rudeness, incompetence, desertion of library reception areas and service desks, pre-occupation with other tasks when attending to users, poor communication, and lack of commitment to keep the promises made to customers were found to be rampant in the libraries.

This poor state of customer service can be attributed to the personality of librarians; poor training of librarians on customer care; lack of documented and internalized customer service standards and policies in the libraries; lack of motivation; understaffing; poor work environment and lack of adequate tools to meet the needs of the users. Research libraries in Kenya must act promptly to remedy this sorry state of affairs. No particular approach can be recommended as the libraries operate in diverse contexts. However, development of customer service standards and empowerment of librarians to comply with them should be considered as some of the critical elements of the possible remedial measures. The Library and Information Studies curricula should also be revised to mainstream customer service units to prepare the students adequately for future responsibilities in offering acceptable customer care in libraries.

7.13 Social networks in and around the libraries

The results of the Social Network Analysis showed two distinct networks comprised of ILRI, ICRAF and KARI on the one hand, and KEMRI and AMREF on the other. These networks are obviously defined by the general research areas which they serve. While AMREF and KEMRI focus on medical research, KARI, ILRI and ICRAF share some research areas such as crop science, soil science, environmental science and pest control, among other disciplines. Consequently, collaboration of researchers from one network with the others is rare but areas of potential collaboration exist. For instance, KEMRI researchers conduct research on medicinal plants which may be of interest to ILRI, KARI or ICRAF researchers. Thus, an interconnection between the two

distinct social networks is possible. It is not clear why such cross-network relationships have not been pursued. Maybe this scenario can be attributed to the lack of effective communication channels between research institutions to keep researchers abreast with what their counterparts are working on. It is also possible that the research institutions or individual researchers maintain some level of secrecy about the research projects perhaps to avoid competitors gaining information about them. Whatever the reason, this scenario is hard to justify and needs to change. The libraries can be used to bridge this gap by creating platforms for the researchers to interact. Librarians should then work to make this possible.

An analysis of the year of publication of the co-authored articles indicated that the level of collaboration between the researchers in the KEMRI-AMREF network has reduced drastically with no article being published by the network for over ten years, that is, since 1998. This finding can be attributed to organizational dynamics and/or change in research focus areas. Ironically, KEMRI has published the highest number of articles (461) while AMREF has published the least (49). Further, the researcher also confirmed that there are many recent publications in the KEMRI articles list with more than ten having been published between July and September 2010 while AMREF had published only two articles in 2010. This scenario is not easy to explain. Maybe, the researchers who used to collaborate have left the institutions or the sponsors who used to fund joint projects no longer work with the organizations. It is also possible that the collaborative projects have been completed. The scenario may have also been caused by inter-organizational competition for scarce resources from similar donors.

The findings also indicated that the highest activity of the ILRI, KARI and ICRAF network was in 2001-2005. It is also evident that the level of activity has slackened after 2005. This trend can be attributed to changes within the organizations as well the recent economic meltdown which affected donor funding on which most of the research institutions rely for their research projects (Falconi 1999; Dizikes 2010). Dizikes (2010) argues that the economic recession has affected the diversity of research forcing the research institutions to focus on single projects and warned that the investment levels in research before the recession may never be realized again soon. Indeed, findings from focus group discussions and interviews with both the librarians and researchers also rated inadequate funding as the major challenge for both the institutions and libraries. These circumstances should stimulate research collaboration as a means of maximizing the scarce resources available and yield

more impact for the researchers and institutions. Therefore, researchers should pursue collaboration more aggressively than before to harness the benefits of social networks.

The sociogram also reveals that ILRI is the most central organization in the social network of all the research institutions analyzed. This may be a reflection of the fact that ILRI conducts research on broad multidisciplinary areas such as biotechnology; market opportunities; people, livestock and the environment; poverty and gender; and sustainable livestock. It may have also arisen from the fact the ILRI hosts many semi-autonomous research institutions conducting research in diverse areas. It follows, therefore, that ILRI has a higher potential to rally together the institutions into a mutually beneficial social network. This potential needs to be harnessed and the librarians should play a role by facilitating interactions through appropriate programming that can catalyze further in-depth dialogue and collaboration between the researchers. The librarians should collaborate with researchers like Omore AO who are connected with many other researchers in this effort.

The fact that there was not even one publication co-authored or authored individually by librarians in the case libraries is a matter of great concern. This may be a pointer to the possibility that the librarians in research libraries in Kenya do not undertake any collaborative research studies. It is also possible that the librarians do not conduct any scientific research at all. Whatever the case is, this matter is serious because it may imply that the librarians are not active in research and thus may not be in a good position to support researchers. This may also explain the general perception that librarians are considered junior in research institutions. But one may ask: if librarians do not publish yet the survival of research institutions is pegged highly on research output, how do they expect to be respected and accorded support? Given that publication of research papers is mainly attached to access to funding, it is possible that the libraries are largely underfunded because the librarians do not attract any research funds. It is incumbent on the librarians to revamp their research efforts either individually or through collaboration with each other and publish in recognized refereed journals. The librarians should also collaborate effectively with the researchers and play significant roles in the research lifecycle to warrant their consideration as co-authors of the research outputs. This is one way of asserting themselves in the research process and elevating their profiles in the research institutions. Publishing may also be a good strategy for raising funds for operational requirements and collection building as are research grants which libraries may have access to. The researcher also proposes that the librarians should organize an association of research libraries in

Kenya to harness their efforts, skills and resources in mitigating the challenges they face in delivering their mandates. This association may also facilitate collaboration between research librarians in Kenya and their counterparts in the region and elsewhere to the benefit of the profession and the library communities. Given ILRI's centrality and potential influence on the network, the researcher proposes that librarians in the institution take a leading role in this process.

From the results, it is also evident that the libraries are not using the potential of social networks to generate and share knowledge effectively. One of the reasons why collaboration may not have been easy is a lack of effective communication platforms to facilitate seamless interaction between researchers from different organizations. This challenge can be reduced through the adoption of simple, generally free and versatile Web 2.0 tools. Some of the organizations are already exploring strategies of employing these tools and already projects such as KLISC[95], KAINET[96] and RAILS[97], RAIN[98], TEEAL[99] and AGORA[100] are ongoing. Most of the networks deal with agriculture. Perhaps this is because of the growing pressure to improve food security especially in the developing countries. Nonetheless, these information networks should be enhanced to leverage collaboration amongst the researchers, librarians, libraries and the research institutions.

7.14 Evaluation of research libraries in Kenya

Almost 70% of the researchers are happy with the services and collection of the research libraries. At the same time 75% of the librarians also said that the research libraries serve the information

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[95] According to Mrs. Jacinta Were, the Kenya Library and Information Services Consortium (KLISC) facilitates and manages collective subscriptions to electronic information resources and journals by member libraries. The information was obtained during an interview conducted by the researcher with her on 3rd April 2009 at the University of Nairobi.

[96] Kenya Agricultural Information Network (KAINET) is an electronic information network set up to promote information exchange among stakeholders in the agricultural sector. It is supported by the Department for International Development (DFID) through the Food and Agriculture Organization (FAO). It is hosted by KARI. Information about KAINET was obtained during interviews on various dates in September 2010 with Mr. Richard Kidemi, an ICT staff supporting the network.

[97] Regional Agricultural Information and Learning System (RAILS) is a learning and knowledge sharing network utilizing emerging information technologies. This information was obtained through interviews with Mr. Patrick Maina, the head librarian at the KARI headquarters, on diverse dates in September 2010.

[98] Regional Agricultural Information Network (RAIN) is a network of the Association of Strengthening Agricultural Research in Eastern and Central Africa (ASARECA). RAIN's mission is to promote sustainable management of client-oriented agricultural information throughout the Eastern and Central African region through the use of appropriate information technology tools. It is supported by the European Union. Information obtained from interviews with Mr. Patrick Maina on diverse dates in September 2010.

[99] The Essential Electronic Agricultural Library (TEEAL) is a full-text and bibliographic source of globally important agricultural scientific journals. Information obtained from interviews with Mr. Patrick Maina in September 2010.

[100] According to an interview with Mr. Anthony Biegon, a librarian at the KARI headquarters, Access to Global Online Research in Agriculture (AGORA) programme provides affordable access to agricultural research publications.

needs of the researchers well. The librarians largely based their evaluation on the feedback provided by the researchers which is generally positive. Significantly, 75% of the researchers said that the research libraries are important to their research projects.

These findings support the contention that research libraries in Kenya generally meet the needs of the researchers in spite of the challenges they face. However, the researchers suggested many areas that need improvement to make the libraries even more useful. It is noteworthy that most of these areas revolve around the adoption of ICT-facilitated resources and services. These improvements can be modelled around Library 2.0 which will then enable the libraries to keep their best practices and improve on the areas where they are weak through integrated human and technological resources to enhance the library experience for researchers.

7.15 Summary

The role of research libraries is to support research through the provision of appropriate information that empowers the researchers to conduct and report research effectively. Most of the research libraries in Kenya play this role effectively. However, there are many areas in which improvement is needed to make the libraries more suitable in light of the emerging global research trends and requirements. Library 2.0 model has a high potential of guiding these improvements which generally revolve around the adoption of appropriate technologies and techniques to design and deliver superior services to researchers.

CHAPTER EIGHT – CONCLUSIONS AND RECOMMENDATIONS

8.0 Introduction

This chapter presents the summary of the major findings and conclusions of the study. The specific potential benefits of Library 2.0 for research libraries in Kenya are also discussed. It also summarizes the major recommendations of the study and identifies issues for possible further research.

8.1 Conclusions on major issues

This section presents the conclusions on the major issues investigated by this research study.

8.1.1 The library ecosystem is changing faster than before

The environment in which research libraries operate has changed remarkably in the past few years. Some of the factors that have catalyzed this change include the emergence of new communication and information management technologies exemplified by the Internet; new legislation guaranteeing information rights which the libraries have to satisfy promptly; a new breed of patrons described as being "promiscuous" with unique information seeking behaviour that is not easy to accommodate using conventional library collections and systems; as well as socio-economic challenges which deplete sources of research funds. Though library environments have been changing constantly, the pace and intensity of current change is so great that conventional library change management strategies cannot cope. Consequently, libraries are losing their position as the primary sources of credible information as more and more users look elsewhere. Because the pace of change seems to be gathering momentum by the day, libraries are now adopting new strategies, tools and techniques to meet the traditional and emerging information needs of their users. Currently, the trend is for libraries to provide convenience, community, empowerment, choice, and the "wow" experience to the users. The situation is more critical for research libraries because researchers are more demanding in terms of the depth and timeliness of their information requirements than other library users. Similarly, they are more aware of, and have access to, alternative sources of information. Therefore, it is not easy to "wow" them. The challenge to meet the needs of the researchers in the rapidly changing library environment is proving difficult for the libraries to surmount using the conventional approaches hence the need to consider emerging library service models. Library 2.0 is

emerging as a preferred model to meet these challenges because it has the potential to enable the research libraries to create a library platform on which the researchers can develop and control their own library experience at the point of need.

8.1.2 The research library in Kenya

Research libraries emerged from the perceived inadequacy of the traditional libraries to meet the specialized needs of researchers. Research libraries provide unique information services and products that support specific research activities. Research libraries are as important to research as laboratories. They exhibit unique characteristics exemplified by in-depth collections of the latest information resources for specific areas of research, personalized services, extensive use of ICTs, attachment to a particular research institution or initiative; relatively higher budgets; and unique and generally small physical library spaces than other library typologies. Further, access to research libraries is typically reserved for researchers. Research libraries in Kenya exhibit similar characteristics with minor adaptations to suit the local socio-economic, technological and research contexts.

Though most research libraries in Kenya have no documented vision, mission or strategic plan, they generally aspire to become one-stop sources of information for the research interests of their parent institutions. The research libraries in Kenya, in their current state, generally meet the information needs of their users. However, there are several areas relating to the services, collections and physical spaces that need to be improved to enable the libraries to meet the needs of the researchers more aptly, promptly and conveniently. For instance, the users suggested that they would appreciate physical library spaces which are comfortable, allow some reasonable level of privacy, are spacious and tidy, and have facilities that support group work. The researchers also emphasized that they would appreciate remote access to the library services and products around the clock; customer-friendly and competent library staff; and access to a wider array of latest research information through subscription, resource sharing and/or personal interaction.

Due to the emerging changes in the research and library ecosystems, research libraries are likely to take on new roles. One such role is citation management through which the research librarians can support the researchers in managing their references effectively. Similarly, the libraries are likely to become platforms of interaction in which researchers relate freely with one another, consumers of

research, information and librarians in ways that benefit their research interests. Further, as the researchers become more self-sufficient, libraries will become virtual and/or physical spaces where the empowered users are able to serve themselves. Thus, the services that progressive research libraries will offer will be characterized by disintermediation, collection development policies based on access rather than ownership, active participation of the researchers, reasonable flexibility, borderlessness (provision of services at the place of need), and timelessness (services at the point of need). The role of emerging ICTs in facilitating this process is unpredictable but cannot be overemphasized.

8.1.3 Operations of research libraries in Kenya

Research libraries in Kenya mainly apply the hybrid library service model emerging from a mix of the traditional and digital library service models. Some also apply the embedded model. Though these models serve the basic needs of the researchers, they do not fully meet the emerging needs of modern researchers. For instance, the inclination of the users to contribute content or participate in content organization is not met by these models of service. Similarly, these models do not fully comply with the provisions of recent legislation in Kenya pertaining to information and communication rights which require ready access to information.

There are loosely-knit social networks around and within research libraries in Kenya and their parent institutions, the full potential of which has neither been harnessed nor realized. Such networks could facilitate pooling of information resources, funds and ideas for the benefit of research in the country. They can also be used to support advocacy and engagement in relevant policy formulation. Similarly, effective social networks can be used to facilitate the extensive dissemination of research findings so as to maximize their impact. Strong social networks can also be used to mentor and build the capacity of budding researchers. Several common research interests exist between the research institutions in Kenya but no reasonable networks have been built around them. The libraries should create platforms for researchers to interact and develop mutually beneficial social networks. Holding events such as public debates,[101] family reading nights,[102] photo galleries, investment talks, proposal

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[101] This event could bring together researchers, policy makers and diverse categories of research consumers from the different research institutions to stimulate establishment of beneficial networks.

[102] This event would address the poor reading habits and also create an opportunity for the researchers' families to interact and possibly build family-based networks which have the potential of supporting the researchers in their pursuits.

writing workshops, or book fairs[103] is one strategy which would create a suitable atmosphere for networking (ALA 2010).

Research libraries in Kenya face many challenges. However, the major ones include inadequate funding, understaffing, inadequate ICT systems and infrastructure, inadequate collection and library physical space, poor dissemination strategy, internal politics and unfavourable organizational structures, and lack of beneficial linkages. These challenges are so serious that to a great extent they compromise the libraries' capacity to offer an effective service. There is no single magic bullet for all the challenges. However, active resource mobilization, retraining and motivation of librarians, collaboration, remodelling of library physical spaces, and improvement of ICT systems can go a long way towards enhancing the capacity of the research libraries in Kenya to provide adequate services.

8.1.4 Models of library services

Several library service models exist. Because their contexts are unique, research libraries generally apply hybrid models to meet the needs of their users. The traditional library model, the oldest library services model, is applied widely by a number of research libraries in Kenya. However, its heavy reliance on the physical collection and the physical library place render it unsuitable for modern research requirements. Similarly, community, bookstore, outpost and mobile libraries lack the depth of services and collection that researchers demand and are therefore not suitable for research libraries. Research libraries can apply embedded and/or digital models as well as certain elements of information commons model of library service. The embedded library model has the potential of taking the library closer to the researchers. Typically, "embedded librarians" also have better understanding of the research areas because they often have background education and training in the general areas of research of the scientists they support. Their qualifications enable them to understand the information needs of the researchers so as to satisfy them effectively. Similarly, embedded librarians are disposed to interact more closely with the researchers. Thus, they can win the support of the researchers and participate effectively in the research process. On the other hand, the key benefit of the digital library service model for research libraries lies in its ability to facilitate convenient and timely delivery of library resources to the researchers. The elements of an information commons which would be beneficial to research libraries include its focus on

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[103] This event should focus on rare books or even banned books. Research libraries have historically been able to acquire banned books even during oppressive regimes such as Hitler's in Germany. In Kenya, Michela Wrong's "*It's our time to eat*" would attract many people.

comfortable physical library space which provides for private and group work; effective application of ICT tools and ready support for using them; and programming which serves various interests of the users going beyond basic research needs.

8.1.5 Library 2.0 model

Although a relatively new term, Library 2.0 has already engraved itself in the librarianship lexicon. There is, however, no widely accepted definition of the concept. Nonetheless, it can be perceived as a new model of library service which harnesses the power of emerging information and communication technologies (Web 2.0) to create a dynamic physical and/or virtual library platform which is defined and controlled by the users and librarians and which facilitates the delivery of a superior library experience to the users anytime, anywhere, anyhow. Thus Library 2.0 describes a new way of library thinking and operation that facilitates the provision of library services that enable users not just to search but to find, access and share information. It also draws from the participation of the users and stimulates consistent change enabling library staff and users to redefine their obligations and expectations.

Several controversies surround the Library 2.0 concept. Most of these revolve around the nature of change it represents, the role of technology in its realization, whether it is better or worse than the models of service which came before it, and the real motivation behind it, that is, whether it works for the interest of library users or the vendors of various products and services it utilizes. Critically, some librarianship practitioners perceive it as an overhyped and unnecessary disruptive concept propagated by people not genuinely interested in dealing with the compelling issues in and around libraries, perhaps in order to distract attention from the real issues. Nonetheless, the model exists and has drawn the attention of many librarians and library users.

Several research and other libraries in the developed world have already embraced the Library 2.0 concept. However, the situation in sub-Saharan Africa is different as many librarians are yet to hear of it let alone implement it. Nonetheless, some libraries, especially the academic libraries, have implemented it. One of these is the University of Pretoria library which adopted the model in 2006 (Pienaar and Smith 2008; Penzhorn 2009). Of the research libraries in Kenya, the ILRI library has made progressive strides towards implementing the model by utilizing several Web 2.0 tools to deliver services. However, the levels of operation and extent of digitization are still too low to

qualify the library to be considered as fully Library 2.0 compliant. For instance, the participation of users, the frequency and regularity of change to library services and products, levels of intermediation as well as removal of barriers to library services still need to be addressed.

It is not possible to conclude categorically, at least for the time being, whether Library 2.0 is better or worse than the other library service models for research libraries in Kenya. It is not possible to generalize because different libraries support unique research programmes, have unique users and operate in different contexts. However, if implemented appropriately, the model has the potential to enable research libraries in Kenya to offer services which meet the community, convenience, empowerment, choice and rich experience needs for which researchers are currently yearning. The heightened level of interest in the model by librarians and researchers during the study indicates that it may remain at centre stage of research librarianship in Kenya for some time.

8.1.6 Challenges research libraries in Kenya are likely to face with Library 2.0
Research libraries in Kenya are likely to face several challenges while implementing the Library 2.0 model. Apart from the challenges anticipated by the librarians such as inadequate funding, unreliable ICT infrastructure, resistance to change, understaffing and copyright issues, the research libraries are also likely to face scalability challenges – such as harmonization of diverse preferences of the users – which are likely to hinder efforts to apply the Library 2.0 model widely. Similarly, the libraries will also have to deal with challenges relating to longevity of Web 2.0 such as the rapid pace of change, possible mergers and buyouts of companies developing Web 2.0 tools which may affect the features of the tools as well as the terms of their use. For instance, a buyout of the original creator of a tool may lead to its commercialization making it expensive for the libraries. It may also lead to changes in the features of the tools which may make them inappropriate for the research libraries.

The libraries should surmount the challenges by working to remove the barriers to Library 2.0; identifying and encouraging enthusiasts; demonstrating the benefits of the model through advocacy programmes (for instance, to dispel myths about Web 2.0 tools like the perception that they are for teenagers); offering practical assistance on how to make the best use of Web 2.0 tools; embracing creative commons[104] to facilitate sharing of copyright material; and conducting ICT training for the researchers and library staff. The libraries should also work with their counterparts in Kenya and

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[104] This is a set of licenses which provide more freedoms than the ordinary copyright.

abroad to exchange ideas, share lessons and implementation tips. It is possible that almost all the challenges the libraries are likely to face have been faced somewhere else and possibly dealt with. The libraries which are just beginning to face the challenges can learn from their counterparts which have successfully surmounted similar challenges. They can also learn about what has not worked well for others and avoid sinking scarce resources in attempting to deploy them in situations of low return. At present, it seems that the librarians are focusing more on the challenges than the opportunities made available by Web 2.0 in general, and Library 2.0 in particular. They also seem to be very concerned not to make any mistakes. While it is prudent to exercise caution on such matters, an extreme case of it (caution) can equally be detrimental.

8.2 Potential of Library 2.0 for research libraries in Kenya

This section suggests and discusses some of the potential benefits of applying the Library 2.0 model to research libraries in Kenya.

8.2.1 Taking the library everywhere the researchers are

The Library 2.0 model enables library services to be visible over a wide array of networked devices enabling the users to access the services conveniently from their own locale. Miller (2006) points out that Library 2.0 goes beyond the notion of "library without walls" and replicates library experiences when and where the users need them. As more researchers adopt ICT tools, research libraries applying the Library 2.0 model will be able to provide services to them at their points of need without requiring them to come to the physical libraries. Thus, with Library 2.0, research libraries can be every place where their users are. This ubiquitous service can be achieved through digitization of the services and products of research libraries using various Web 2.0 tools. As portable ICT tools such as mobile phones become more advanced and ubiquitous amongst researchers, the libraries will need to facilitate the users to access services and products on mobile devices such as cell phones. Apart from extending the reach of the services beyond the physical sphere of the library, this approach would also save the time and other resources currently being used by librarians or by the researchers to access the physical services but with little gain. Taking the library services where the researchers are, through Library 2.0, would also reduce the pressure on the physical libraries and boost service delivery when it is necessary to come to the facilities.

8.2.2 Removing barriers to library services

Using the Library 2.0 model would enable the researchers to access services freely and facilitate them to use, remix and share information of interest to them extensively. Applying the Library 2.0 model would reduce bureaucracy and other bottlenecks in the provision of services to the researchers. As Stephens (2005) puts it, using the Library 2.0 model enables librarians, users and other stakeholders to collaborate in enhancing the availability of information. Further, it reduces barriers to effective library service delivery such as unfavourable opening hours, inadequate librarians, mis-shelving and poor customer care, among other factors. The Library 2.0 model also facilitates continuous learning which removes the skill barriers (of users and librarians) limiting capacity to maximize library services. Similarly, it removes barriers related to the use of physical information resources such as overdue fines; fees and other user charges; having to wait for borrowed materials to be returned; or having to travel long distances to access the services. Due to the digital nature of most of its resources and services, the Library 2.0 model also has the potential to remove barriers to access to information for the disabled and other users who may be facing various forms of discrimination or stigmatization, as they would use the resources remotely in a personalized atmosphere and maximize the benefits of the library resources. Similarly, use of resources and services based on Library 2.0 does not require physical strength. For instance, there are no stairs to climb, distances to travel or shelves to browse. Library 2.0 services also utilize multimedia tools which can be valuable for sight-disabled users. The Library 2.0 model services generally utilize mash-up approaches which cater for diverse technologies and techniques and personalization, thus enabling libraries to provide information which is not linked to a particular technology, format or method of delivery.

Apart from these techno-based advantages, embracing the Library 2.0 model also presupposes a paradigmatic shift in the mindset of librarians who are then disposed to offer better customer service to the users and thus enabling them (users) to gain more from the libraries. The cost of failure to access valuable information for researchers may not be easy to quantify but it can be perceived, for instance, in terms of missed opportunities for partnerships and research funding or misinformation which would compromise the quality of research. Consequently, it is important that research librarians work diligently to remove, or at least reduce, the information barriers to levels at which their impact on the services is minimal (Bohall 2008).

8.2.3 Catalyzing and directing constant purposeful change

Gallacher (1999) explains that change in libraries is not just inevitable but also continual. Friend (1998) adds that libraries of all typologies are always grappling with multiple forms of change leaving no space for consolidation. Collier (2006) suggests that more fundamental change surrounds research libraries serving biomedical and natural sciences than those serving the humanities. John (2007) explains that most libraries find it difficult to manage change in their environment. She suggests that one important determinant of the effectiveness of change management in research libraries relates to its relationship with its users. The Library 2.0 model, by facilitating effective collaboration with the users, enables libraries to anticipate and manage change in their internal and external environments effectively. Library 2.0 also uses ICT systems which make it easy for the librarians to monitor levels of use of the services and products seamlessly. This information on usage enables librarians to capture trends which may point to the occurrence and/or possible direction of change around and within the libraries to which they can then respond promptly (Casey and Savastinuk 2007b). Thus, the Library 2.0 model has the potential to detect pressures for change around the libraries and guide how the research libraries respond to enable them to remain relevant to the emerging needs of the researchers.

The use of the Library 2.0 model also makes diverse information tools and platforms which enhance the skills and expectations of the users available, enabling them to ask for more hence catalyzing myriad changes in the libraries. Libraries employing the Library 2.0 model create platforms for sharing tasks with library users, through Web 2.0 tools such as tagging or social bookmarking, and thus freeing more "hands" to deal with change in the libraries. Similarly, applying the Library 2.0 model facilitates disintermediation and self-service which reduces the traditional workload on librarians and creates windows for them to handle the emerging responsibilities such as citation management, mentorship and programming.

Casey (2005) also explains that Library 2.0 has an inbuilt assumption of change in which the services deployed are deemed not to be good enough and treated as mere beta versions of the perfect. Thus the Library 2.0 model begins with the understanding that the "imperfect" services will continually be improved by the librarians, users and other stakeholders as they are used. In the context of research libraries, applying Library 2.0 can stimulate and direct purposeful change and constantly align the library services and products to the emerging needs of the researchers through collective intelligence;

regular intensive review of the services and products by both the users and librarians; surveillance of the library and information ecosystem to anticipate change and respond accordingly; and providing the technology and non-technology systems to harness change in the library environment.

8.2.4 Harnessing the participation of users

Friend (1998) observes that in the past, libraries have largely been passive institutions waiting to be used. He notes, and rightly so, that the trend has changed with a culture of user participation becoming engrained in most libraries. However, several challenges remain to institutionalizing user participation in libraries. The Library 2.0 model holds great potential to facilitate libraries to harness the participation of the users. This potential stems from the fact that the Library 2.0 model uses systems that actively invite the participation of the users in determining what and how they are served. The Library 2.0 model enables users to participate in collection development as well as the organization and sharing of the same. Significantly, libraries applying this model view the users as collaborators or co-creators whose input is vital for the libraries. The Library 2.0 model also employs tools that facilitate constant versatile communication with the users and embraces communally innovative approaches which yield products and services which are user-centric. Similarly, Library 2.0 users are enabled to create new content, remix available content and share knowledge freely using simple Web 2.0 tools with little or no intervention from the librarians.

The Library 2.0 model also has the potential to enable the research libraries to develop into communities in which users and librarians collaborate to create open services through which the members can interact with one another in tagging, commenting, reviewing/rating, annotating, and bookmarking library collections to make them more usable by all the members. To be successful, the users and librarians cultivate high levels of trust founded on the understanding that everyone contributes in good faith. As the users and librarians interact more, the library becomes more relevant and usable (Cohen 2007c).

Participation of researchers in the management of research libraries in Kenya is currently nominal. Librarians can foster better user participation by applying the Library 2.0 model which provides the environment, mental paradigm and tools which are appropriate for effective interaction between the researchers themselves and with the librarians. Libraries applying the Library 2.0 model also exhibit high levels of flexibility which enable users to customize the library services and products to meet

their personal information needs. This flexibility encourages the users to try new ideas and tools confidently.

8.2.5 Retaining Patrons 2.0

A new brand of library users, described as Patrons 2.0, who exhibit unique information seeking behaviour has emerged. This breed of user is generally young, exhibits a know-it-all attitude, glorifies ICTs, depends more on peers, finds it easier to "Google" than visit a physical library, wants to be in charge of library usage, and wants to contribute content. Critically, studies indicate that these users are gradually reducing their usage of the physical library. The findings of this study indicate that most of the researchers are fairly young and generally fit the attributes of Patrons 2.0. Consequently, research libraries face the challenge of keeping these users. The Library 2.0 model addresses most of the interests of these users such as the provision of opportunities to contribute content, influence the services, experiment with emerging ICT tools, network with peers, as well as the possibility of accessing the services remotely. It seems that there is no better way to retain these users, at the moment, than by adopting the Library 2.0. The Library 2.0 model also provides a platform in which researchers can interact effectively through Web 2.0 tools and develop social networks that may also enhance their levels of library usage. The librarians need to be aware of the fact that the reverse is also possible and plan adequately to prevent the networks from negatively impacting on the libraries.

The use of Library 2.0 model also gives the researchers the opportunity to work with librarians to improve the library experience. This synergy between researchers and librarians has the potential to retain the library users by addressing issues of interest to them promptly. Using the Library 2.0 model also creates and sustains an environment which is conducive to self-service. Thus, the researchers take some responsibility for their use and become aware that they are in charge of their usage and that their experience largely depends on their creativity. However, librarians would still need to provide support to enhance the researchers' experience such as training them on how best to use specific Web 2.0 tools for research as well as the provision of online "how-to" manuals on various elements of library services and products.

One of the factors identified as hampering the effective use of research libraries is lack of awareness of what the libraries hold or offer. Web 2.0 tools used within a Library 2.0 environment have the potential of creating robust channels of communication to keep the researchers aware of library

services and products. With this awareness, the researchers are likely to appreciate the libraries more and keep using them. The research libraries can also use Web 2.0 tools to rally the users around the library by integrating the relevant components of information resources scattered in various locations in cyberspace and elsewhere. Thus, instead of the users going to those sources independently, the library brings these resources to the users and remixes them with other sources to create a better research information environment than that offered by the independent components on their own. This strategy has the potential of retaining users in the library which provides mash-ups of alternative sources of research information from one virtual/physical location or tool.

Another element of Library 2.0 model which may be useful in helping research libraries in Kenya to retain the current and attract more users is the provision of a coffee shop near or within the library physical space. Patrons 2.0 believe that books[105] and coffee go together just like movies and popcorn. A coffee shop twinned with the library provides a physical and social environment which would attract the researchers to unwind as they use the library. Depending on the parent institution, this coffee shop can serve as a "members' club" where researchers mingle and exchange information on research ideas, personal happenings (birth of babies, weddings of children or siblings, anniversaries, pets, and many more) and general information. Promotional counters could be erected in this physical space for new library items, announcements, magazines, newspapers and gift items for sale (branded caps, pens, T-shirts, among others). This space can also be reorganized from time to time to host various programmes of interest. A researcher will find it more convenient and economical to use this facility than drive through the traffic to a shopping mall outside the research institution. Whether the management of the coffee shop is outsourced or not, the staff in the facility should be oriented to understand that the shop is indeed an extension of the library. Given that most of the research institutions are already offering some catering services[106] within the premises, extending and remodelling these services to encompass a library coffee shop would not be difficult to implement. The operations and services of the shop should be aligned to the vision and mission of the specific library. Further, this facility may provide some revenue which can be ploughed back into the library to support its services.

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[105] This is used here to signify all elements of library usage.
[106] These services currently provide food and beverages at certain times only and close very early.

8.2.6 Customer-centeredness

Millwood (2009) defines a user-centered library as one which determines its goals and practices based on its users' needs on a continuous basis. Jennings (2009) explains that user-centeredness in libraries is about remaining relevant by playing essential roles for the users, anticipating and meeting emerging users' needs, empowering the users to participate in the library decision making process and to self-serve, being flexible and ready to change policies and services that create barriers to effective use of the library. She also suggests that a clear vision and mission, customer care policy, and communication strategy place libraries in a better position to be user-centered.

Butler (1993) describes user-centeredness in libraries as giving pre-eminence to the habits, needs, desires, dislikes, abilities and preferences of the users over other interests. She explains further that a user-centered approach should be entrenched in all aspects of library operations right from its inception for it to be effective. Butler (1993) also asserts that if user-centeredness is to be achieved in research libraries then information professionals must understand what the needs and wants of the users are, how they would like to be served as well as what technologies they would like to use; administrators should project libraries as information organizations created for users to provide responsive services to the users; the libraries should be flexible and less hierarchical so as to create an environment which is conducive to the information professionals using their expertise effectively in delivering suitable services to the users in an efficient, productive and cost-effective manner; the libraries must attract and retain information professionals who are able to harness the opportunities and benefits provided by the emerging technologies. Thus, an effective user-centered approach begins with the users in mind.

Casey and Savastinuk (2007b) assert that user-centeredness is the "heart" of Library 2.0. The Library 2.0 model provides an environment in which users and information professionals interact effectively and thus develop a better understanding of one another. Similarly, the model facilitates user participation in all aspects of library operations which ensures that the users get an opportunity to influence the decision on what services and products the library provides and how. As discussed earlier, the model also enables users to work with the librarians in constantly reviewing the library services and products in an effort to keep them aligned to the emerging needs of the users catalyzed by changes in their socio-economic, professional and technological environment.

Another critical element of Library 2.0 model which is an important aspect of user-centeredness is the way it deals with the long tail. Since it generally empowers users to self-serve, it gives them the opportunity to meet their unique information needs through techniques and tools that they are comfortable with and at their own convenience. Technically, researcher's needs are catered for with the onus of appropriate usage being with the researchers themselves. It is not practically possible to provide for all the user needs but Library 2.0 model places the key in the form of tools, and skills to access the massive sphere of information in the researchers' own hands. Further, this approach enables the researchers to exchange information and thus build fresh content which it may not be possible to acquire through the traditional library collection development approaches. For instance, a researcher working on bio-fuels in one of the research institutions said that her area of research is new in her institution and is often ignored by the library because there are few researchers who have interest in the topic. Using Library 2.0 approaches, the library in question can give the researcher the tools and skills to enable her to link up with other researchers with similar interests and generate or exchange information which is crucial for their interest. Thus, Library 2.0 model makes it possible for research libraries to include most people's interests cost-effectively.

8.3 Recommendations

This section presents the major recommendations of the study.

8.3.1 Some guidelines on implementing Library 2.0 in research libraries in Kenya

Many librarians admit that implementing the Library 2.0 model is challenging. The challenges are likely to emanate from technological, economic and staffing constraints. A systems approach such as the David Lee King Ripple Effect model is likely to be suitable for implementing the Library 2.0 model in research libraries in Kenya. The model proposes the following phases:

1. *Traditional library:* This is where most of the research libraries in Kenya were a few years ago. They were using the traditional library model and relied more on the physical collection and space to deliver library services at specific times and physical places. This model used to limit the interaction between the users with the libraries, librarians and with each other and led to underutilization of the libraries and unsatisfied researchers. Fortunately, none of the case research libraries studied is utilizing a pure traditional model.

2. *Augmenting the traditional library:* This is where most research libraries in Kenya are. They have begun enriching the traditional model. Some of them have already adopted other models

such as the embedded and digital models of library service. Most of them have also deployed basic Web 2.0 tools such as blogs but only as part of the traditional services or websites. Thus, the 2.0 services are being considered as minor add-ons to the traditional services which are still dominant. Similarly, the level of adoption of these tools and the human resources committed to them remain low. The low presence of Web 2.0 tools in the libraries largely stems from the perception of many researchers and librarians that these tools are social and have little research potential. Notably, the perception is changing steadily.

3. *Change and scanning the horizon:* The libraries are currently considering various emerging tools such as Slideshare, Facebook, YouTube, Flickr, social bookmarking and wikis. They are also enhancing their websites and blogs to offer more services to the users who are steadily becoming ICT aware and demanding far more. However, most of the libraries have not made any meaningful progress in adopting any of the 2.0 tools. Inadequate funding, low ICT skills, understaffing and technophobia are the major factors hampering progress in this phase. Nonetheless, ILRI has made good progress and has adopted various Web 2.0 tools and other in-house systems to capture, organize and share its knowledge. In fact, most researchers in other institutions have taken note of this progress and commonly mention the ILRI library as a good example of what research libraries in Kenya should be like.

4. *Pilot projects:* The research libraries need to take the bold step and experiment with some of the tools. The librarians should be confident to "play" with emerging tools and explore possibilities of digital conversations, experiment with video, or start podcasting. The choice of tools here would depend on the context of the specific library and the unique needs of its users. For instance, the researcher found that KARI is already making videos which are being aired on the national television. It is easier for the library to customize the same videos and post them on YouTube or disseminate them as podcasts.

5. *Customer participation:* After the library staff have experimented with the various tools and confirmed which ones have good potential for the researchers, they can then develop prototypes which the users can be invited to test. To boost the confidence of the users, the librarians should focus on demonstrating how the tools can be used to meet the specific information needs of the researchers. From here, the researchers can then be encouraged to explore the tools on their own and customize them to meet their needs. It is also important that the researchers are empowered to use the tools through proper training and provision of the necessary facilities. Trusting the users, the librarians then should reduce their level of

mediation and focus more on facilitation. Due to the rapid change of ICTs both the users and librarians should remain flexible to integrate new tools as they emerge. The development should not stop with the deployment of current Web 2.0 tools because others will emerge.

6. *Community engagement:* This is the ultimate goal of Library 2.0. When the researchers, librarians and consumers of research converse effectively, then the research libraries will have achieved the purpose for which they are established. Fig 8.1 is an adapted version of David Lee King's Ripple Effect model by the researcher. Besides other additions, the arrows are pointing in all directions to indicate that the ripples are multi-directional. Libraries in this state influence and are influenced by their environments. Thus, the services and tools will continue to be perfected while they are being used.

Fig 8.1 – Adapted model of the David Lee King's Library 2.0 ripple effect

Source: Researcher

8.3.2 Implications for practice

Based on the findings of the study, the researcher makes the following recommendations:

1. To win the respect of the researchers and contribute effectively in institutional decision making and policy formulation, librarians heading research libraries in Kenya should preferably hold a PhD. Similarly, the librarians should undertake their own research and publish scientific papers to make them more visible and attract more research funds.

2. Research libraries should form strong links with academic libraries offering courses in their research areas. In fact, research and academic libraries can form a common professional association to guide these partnerships. Already such associations exist in most parts of the world and go by names such as "Association of College and Research Libraries" in North America or "Association of Academic and Research Librarians" in the Philippines. It seems that no such association exists in Africa at the moment.

3. The libraries should also form a research libraries' consortium. Currently, there is only one information consortium in Kenya, the Kenya Library Information Service Consortium (KLISC), which serves all types of libraries. Research and academic libraries have complained in the past that their interests – such as the need for subscriptions to specialized journals – are not met fully by the consortium. A specialized consortium for research and academic libraries would fill that gap.

4. Research libraries should begin to consider grey literature as important sources of research information. At the moment, none of the case study libraries have a strategy of dealing with grey literature. As the libraries embark on developing their strategic plans in the next year or so (as they had indicated), they should include a plan for dealing with grey literature. Slideshare, Google Scholar and wikis (general and specialized wikis for workshops) are worth considering in these efforts.

5. Professional librarianship education should include courses on ICTs, models of library service, marketing and facilitation (training) to equip the students with the skills they need to meet the emerging demands on librarians.

8.3.3 Implications for policy

The findings of this study can influence librarianship policy at global, regional, national and local (research institutions) levels. At the global level, the findings can influence the development of research library collection development policy, job analysis and description for research librarians, as well as policy on Internet access and use in research libraries. At the regional (Africa) and sub-regional (East Africa) levels, the findings of this study can be used in the development of

collaboration, resources sharing and librarian training policies. The findings can also be used at the national and local levels to influence policy on resource allocation to the libraries, motivation of librarians, ICT systems, architecture of research library physical spaces, library promotion and marketing, models of library service, and customer care.

8.3.4 Implications for theory

This study contributes the adapted model of David Lee King's Library 2.0 ripple effect (see Fig 8.1). It also proposes the Research Library 2.0 meme map (Fig 8.2) which combines the Web 2.0 meme map (Fig 4.1), Library 2.0 meme map (Fig 4.2) with the researcher's experience and research findings. The proposed Research Library 2.0 meme map is different from the previous ones in that it is specific to research libraries and brings in several new components. It also underscores the fact that such a library environment can only be brought about by the active interaction of enhanced collection (Collection 2.0), library physical space (Physical Space 2.0), researchers (Researcher 2.0) and librarians (Librarian 2.0) whose key characterizations in the light of the emerging trends are summarized in the respective compartments. This interaction yields the Research Library 2.0 model characterized by mutual trust, flexibility, user participation, the removal of barriers, unlimited access to library services, increased user control, as well as a physical, virtual and social environment in which researchers find fun to work. Critically, the researcher proposes that all these components are so intertwined that they can be considered as one. Thus, the researcher does not use any arrows because all the components are mashed-up to create a unique experience which is not directly influenced by the individual components but by the conglomeration of all the components. This is a deviation from earlier models which emphasized the features of the individual parts and treated them as existing distinctly from the whole.

8.3.5 Issues for further study

The following issues were touched in this research study but were not dealt with in-depth due to the various limitations as well as the need to remain within the scope of this present study. Consequently, this researcher suggests the following possible areas for further research:

1. *The potential of Library 2.0 model for other library typologies in Kenya*: The other library typologies in Kenya, especially academic and public libraries face similar challenges with research libraries. The key research issue here would be to explore the potential of Library 2.0 model in

helping these libraries respond to their challenges. Several studies on the benefits and challenges of adopting ICT tools in libraries in Kenya exist. Ondari-Okemwa (1999) examined the challenges associated with library automation, Ondari and Kitendo (2004) explored the various ICT tools being adopted by public libraries, Maruti (2004) investigated the levels of adoption of ICTs in the Nairobi City Council libraries, Ingutia-Oyieke (2008) compared the use of ICTs in the public and private university libraries in Kenya while Odero-Musakali and Mutula (2007) studied the status and benefits of ICTs for the university libraries in Kenya. No study on the possible merits or demerits of the Library 2.0 model for various library typologies in Kenya exists.

RESEARCH LIBRARY 2.0 MEME MAP

PHYSICAL SPACE 2.0
Comfortable
Guarantees privacy
Ample space ("acceptable radius")
Separates "quiet" and loud activities
Ventilated
Appropriate lighting
Clean
Easy navigation
Supports group work
Allows refreshments ("books" and "coffee")
Entertaining
Facilitates ready help
Appropriate workspace
Easily accessible

COLLECTION 2.0
Access not ownership
Diverse (grey literature, "Readers' Digest")
Timely (cutting edge)
Apropriate package
In-depth
Multimedia
Minimal shelf-space
Thematic

**User-centricity
Constant purposeful change
The long-tail
Rich user experience
24/7 service**

RESEARCHER 2.0
Generally young or middle-aged
Know-it-all attitude
Low tolerance to delays
Competent and comfortable with ICTs
Glorifies ICTs
Feels obligated to remain connected
"Promiscuous" information seeking
Cherishes instant gratification
Trusts the peers
Nomadic
Not drawn to libraries by collections per se
Wants to be in charge of library usage
Prefers to use own equipment
Content creator
Creative (innovative)
Thinks in "hypertext" (non-linear)
Easily bored

LIBRARIAN 2.0
Technically competent
Friendly and approachable
Ready to learn (open minded)
Adventurous
Facilitator
Mentor
Resources mobilizer
Marketer

The Library trusts the researchers

The library is flexible and uses mash-ups

The library invites participation

The library has no barriers

The library is human

The library is everywhere

The library lets

The library is a platform

The library is fun to work from

Fig 8.2 – Research Library 2.0 meme map
Source: Researcher

2. *The potential of Library 2.0 model for research and other libraries in Africa*: Not many studies exist on the potential or actual application of the Library 2.0 model in African libraries. The pioneering study by Pienaar and Smith (2008) focused on the adoption of the model in academic libraries. Wood (2009) investigated how well websites of academic libraries in South Africa have adopted Web 2.0 tools while Atulomah (2010) examined how aware of

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the Library 2.0 model the university librarians in Nigeria are. Most other studies are based in South Africa and focus more on the academic libraries. There is need to expand the horizon of research in this area to cover the rest of Africa and the other library typologies.

3. *The influence of gender on the librarianship profession in Africa*: Several studies from the rest of the world seem to suggest that the librarianship profession is dominated by the female gender. Indeed, some even suggest that male librarians are perceived as being effeminate and failures in the esteemed professions they ought to pursue. Issues of interest would be whether there are any gender-based factors that predispose males or females to join the profession or not. Ascertaining whether there are differences in the career paths of male and female librarians based on gender would also be of interest. There are a few studies on this topic focusing on Africa. However, their findings and conclusions seem to conflict. For instance, while studies by Atinmo and Jimba (2002) and Majanja and Kiplang'at (2003) concluded that male librarians dominate the profession in Africa, Nwezeh (2009) concludes that there is no gender-based domination of the profession. The findings of this present study also seem to suggest that female librarians dominate the profession. Therefore, further studies to paint the real picture of the situation are necessary.

4. *An inventory of all types of libraries in Kenya*: Currently, there is no documented list of libraries in Kenya. A directory of libraries in Kenya was reportedly published in the 1980s but it seemingly went out of print several years ago and the researcher was not able to find any copy of it even in the Kenya National Archives or the Kenya National Library Service which ought to keep legal deposits of all works published in Kenya. Studies which would lead to the publication of such a directory for all library typologies would fill this gap.

5. *The application of Social Network Analysis in Library and Information research*: Even though Social Network Analysis has been embraced by other disciplines, Library and Information Science seems to be lagging behind. Research on its potential as well as how to apply it would be useful. Given the levels of connectivity currently made possible through Web 2.0 tools, such studies would provide critical information on how to harness social networks to conceptualize and deliver appropriate library services.

Other issues which may be of interest to researchers include investigating the correlation between the adoption of information and communication technology and library user satisfaction; ethical considerations in the adoption of new models of service which may expose libraries to negative

moral and legal consequences; determining how best to yield control of library instruments to users without compromising the stability of the library; and reducing the dependence of modern library services on technology.

8.4 Evaluation of methodology

As indicated in Chapter Five, this study applied the interpretivist research paradigm as well as the case study method. The researcher collected data through documentary analysis, interviews, focus group discussions, direct observation, and mystery shopping. To ensure validity and reliability of the findings, the researcher pre-tested the data collection tools (questionnaires) and made appropriate changes; piloted the techniques and made changes to the Social Network Analysis approaches; modified the approach for focus group discussions for head and middle-level librarians; as shown in Chapter Five. The researcher also used methodological triangulation to mitigate the Halo Effect. Similarly, he used research assistants unfamiliar to the library staff and users to undertake direct observations and mystery shopping to mitigate the Hawthorne Effect. From the foregoing, the researcher is confident that the results of this research study are valid and reliable.

The researcher also maintained ethical standards throughout the study. He ensured that the participants were adequately briefed on the relevant elements of the study that enabled them to grant informed consent for participation. Further, the results of the study have been reported in aggregates and thus guarantee the confidentiality of the data collected. As indicated in Chapter Five, the methodology of this study as well as the data collection tools and approaches were reviewed and approved by the University of KwaZulu-Natal as ethical.

8.5 Summary

Library 2.0 holds great potential for research libraries in Kenya. However, several challenges hamper the full realization of these benefits. As users become more aware of ICT tools and as the competition between libraries and other alternative sources of research information increase, research libraries in Kenya ought to take bold steps and embrace Web 2.0 tools within Library 2.0 paradigm to offer user-centric services and products to the users. Research libraries in Kenya, which will not have embraced the Library 2.0 model meaningfully in the next two or so years, face the possibility of becoming irrelevant to the researchers.

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APPENDICES

Appendix 1: Objectives/research questions-data source matrix

Objective	Question	Data Source	Remarks
Develop requisite benchmarks for research libraries in Kenya	What is the vision of research libraries in Kenya?	➢ Questionnaire for users – 5(b) ➢ Questionnaire for librarians – 7(b) ➢ Focus Group Discussions with librarians and users - 1(a) ➢ Secondary and primary sources	To collect data on the real and perceived role of research libraries in Kenya and ascertain to what extent the role has been played by the case libraries as well as whether and how the roles should change in light of the new information technology revolution.
	What is the mission of research libraries in Kenya?	➢ Questionnaire for users – 5(b) ➢ Questionnaire for librarians – 7(c) ➢ Focus Group Discussions with librarians and users - 1(a) ➢ Secondary and primary sources	The primary sources of data are the case libraries' policy documents, strategic plans, evaluation reports.
	How well has this role been played?	➢ Questionnaire for users – 5(c) ➢ Questionnaire for librarians – 7(d) ➢ Focus Group Discussions with librarians and users – 1(b)	The secondary data sources are online and print literature on the subject.
	How are the roles of research libraries in Kenya changing in light of the information revolution?	➢ Focus Group Discussions with librarians and users – 1(c) ➢ Secondary sources	
Understand the operations of research libraries in Kenya	What service models are currently employed by the research libraries in Kenya?	➢ Focus Group Discussions with librarians – 2(a) ➢ Questionnaire for librarians – 3(a) ➢ Secondary and primary sources	Get the service design and delivery approaches employed by the libraries and compare with categorization which may be available in librarianship publications.
	How effective are these models in fulfilling the vision and mission of the libraries?	➢ Questionnaire for users – 4(a)(b) ➢ Questionnaire for librarians – 8 (a)(b) ➢ Focus Group Discussions with librarians – 2(b)	Linking the overall evaluation of the services with the models of services employed and making correct attributions.

	How are the models applied compliant to the provisions and requirements of the Freedom of Information Policy (2006) as well as the Kenya National ICT Policy (2006)?	➢ Focus Group Discussion with librarians – 2(d) ➢ Secondary sources	Outline the key provisions of the Act and find out how the service models employed do or do not comply with it.
	Are there any social networks existing in the ecosystem of this library? What is their current impact? How can they benefit the library?	➢ Social Network Analysis ➢ Focus Group Discussions	Unveiling the social networks which may be existing, the impact they currently have on the operations of the libraries as well as how best to use them to benefit the libraries.
	What are some of the challenges already identified by the libraries and their communities of users?	➢ Focus Group Discussions with librarians (6) and users (5) ➢ Questionnaire for librarians – 5(a)(b) ➢ Questionnaire for users - 4 ➢ Primary sources	Other than the questions directly asking about challenges, information on this can also be obtained from several items probing the appropriateness of the services, issues the users don't like, what the users and librarians hope to add or remove from the menu of services or tools.
	What other challenges exist?	➢ Questionnaire – article 5(e) ➢ Focus Group Discussions with librarians (6) and users (5) ➢ Observation	
	How, and to what extent, do these challenges affect the success of these libraries?	➢ Questionnaires ➢ Focus Group Discussions ➢ Observation ➢ Secondary sources	The researcher will link various responses and establish appropriate attributions.
Identify and explore other models of library service that could be adopted by the research libraries in Kenya	What other library service models exist?	➢ Secondary sources ➢ Questionnaire with librarians – 3(b) ➢ Focus Group Discussions with librarians – 2(b)	This is aimed at getting an insight of the alternative models of service that these libraries could employ.
	What are their advantages and disadvantages for research libraries in Kenya?	➢ Secondary sources ➢ Focus Group Discussions with librarians	Analyze the key features of the models and link them with the needs of the users and librarians as identified.
Explore the Library 2.0 Model	What is Library 2.0?	➢ Secondary sources	Conduct documentary analysis of what Library

			2.0 really is.
	What are the controversies around the model?	➢ Secondary sources	Identify and analyze the controversies surrounding Library 2.0 as a library service model.
	Which libraries have adopted this model?	➢ Secondary sources ➢ Focus Group Discussions with librarians – 3(b)	Find out which libraries have implemented the model. Apart from documentary analysis, FGD with librarians will also provide information on this.
	Which lessons can be learnt from their experience?	➢ Secondary sources ➢ Focus Group Discussions with librarians – 3(b)	Find the lessons from the implementers and documentary sources.
	What is the future of Library 2.0?	➢ Secondary sources ➢ Focus Group Discussions – 3	Analyze opinions, lessons, challenges of Library 2.0 and "predict" the possible future as a service model.
Applying the Library 2.0 Model for Research Libraries in Kenya	What are the benefits of adopting the model for research libraries in Kenya?	➢ Secondary sources ➢ Focus Group Discussions with librarians – 3(c)(d)	Link the key features of the model with the needs, expectations and challenges of the libraries.
	What challenges are the libraries likely to face when adopting this model?	➢ Secondary sources ➢ Focus Group Discussions with librarians – 3(e)	Link the lessons learnt from the current implementers with the challenges of the case libraries.
	What is the plan of action that should be taken by research libraries in Kenya seeking to become Research Library 2.0?	➢ Secondary sources ➢ Focus Group Discussions with librarians – 3(f)	Develop a plan of action based on the lessons learnt from current implementers as well as the challenges of the case libraries.

Appendix 2: 2009 KLISC members *(Case libraries are shown in bold)*

Public Universities

1. Egerton University

2. Jomo Kenyatta University of Agriculture and Technology (JKUAT)

3. Kenyatta University

4. Maseno University

5. Masinde Muliro University

6. Moi University

7. University of Nairobi

Private Universities

8. African Nazarene University (ANU)

9. Aga Khan University

10. Catholic University of East Africa

11. Daystar University

12. Great Lakes University of Kisumu

13. Kabarak University

14. Kenya College of Accountancy University

15. Kenya Methodist University

16. Mombasa Polytechnic University College

17. Pan African Christian University

18. St Paul's University

19. Strathmore University

20. United States International University

21. University of Eastern Africa, Baraton

Non-University Institutions

22. **African Medical and Research Foundation (AMREF) – case library**

23. African Population and Health Research Centre (APHRC)

24. Australian Studies Institute

25. Bandari College

26. Commission of Higher Education (CHE)

27. Communications Commission of Kenya (CCK)

28. Human Rights

29. Institute Francais De Rech (French Institute of Research)

30. International Centre for Insect Physiology and Ecology (ICIPE)

31. International Livestock Research Institute (ILRI) – case library

32. Kenya Agricultural Research Institute (KARI) – case library

33. Kenya College of Communications Technology (KCCT)

34. Kenya Forestry Research Institute (KEFRI)

35. Kenya Institute of Management (KIM)

36. Kenya Medical Research Institute (KEMRI) – case library

37. Kenya National Library Services (KNLS)

38. Kenya Revenue Authority (KRA)

39. Kenya School of Monitory Studies (KSMS)

40. Kenya School of Professional Studies (KSPS)

41. Kenya Wildlife Services (KWS)

42. Maris International College

43. Ministry of Foreign Affairs

44. National Economic and Social Council (NESC)

45. Nairobi Evangelical Graduate School of Theology

46. National Defense College

47. Presbyterian Church of East Africa Pastoral Institute

48. Tangaza College

49. World Agroforestry Centre (ICRAF) – case library

Appendix 3 – Model annual budget for a research library in Kenya

ITEM	KSh
Staff	6,500,000
Books	1,000,000
Journals	3,000,000
Conferences/Workshops/Training	150,000
Staff Development	500,000
Office & Computer supplies	1,000,000
Reprographics	500,000
Software licenses	1,000,000
Postage	100,000
Telephone	150,000
Fax	50,000
Internet/email	60,000
Electricity	250,000
Water	60,000
Building & infrastructure maintenance	500,000
Furniture & Equipment	500,000
Transport	150,000
Official international travel	500,000
Capital budget	1,000,000
TOTAL	**16,970,000**

Approx. KSh 17m

Ksh 17m is approximately **USD 224,000** by the August 2009
exchange rates

Appendix 5.1 – Participant declaration

Potential of Library 2.0 for Research Libraries in Kenya: Multiple Case Studies

Participant Declaration

I……………………………………………………………………. (Full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at anytime, should I so desire.

SIGNATURE OF PARTICIPANT   DATE

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POTENTIAL OF LIBRARY 2.0 FOR RESEARCH LIBRARIES IN KENYA: MULTIPLE CASE STUDIES
FOCUS GROUP DISCUSSION QUESTIONS FOR LIBRARIANS

My name is Tom Kwanya. I am a PhD (Information Studies) student at the University of KwaZulu-Natal. I am carrying out a research study to investigate the potential of Library 2.0, a new model of library service, for research libraries in Kenya. The aim of the study is to explore whether Library 2.0 is a better alternative to service models currently used by research libraries in Kenya. Your responses will only be reported in the aggregate and will be treated with utmost confidentiality. Thank you for accepting to be part of this research; you are at liberty to withdraw at any point.

I'd like to remind you that there is no right or wrong answer in this discussion. I am interested in knowing what each one of you thinks about the issues at hand, so feel free and be frank to share your view regardless of whether it is opposed to the view held by most participants. Your opinion(s) matter and it is important that you state it (them) without fear.

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Let us start by introducing ourselves.

Questions

1. *Role of the Research Libraries*
   a. What do you think is the real role of research libraries in Kenya? (Is it to aid research? Disseminate research findings to the community? Stimulate new research?)
   b. Has this library played this role effectively? Please, explain your answer.
   c. Should the role definition change?
      i. How?
      ii. Why?
   d. How compliant do you think this library is with the provisions of the recent information legislations and policies such as the Freedom of Information Policy (2006), the Kenya National ICT Policy (2006), Kenya Communications (Amendment) Act (2008) as well as the Harmonized Draft Constitution of Kenya (2009)? *(Explain the key provisions that relate to access to information).*
   e. What should the key benchmarks (of service, collection, physical facilities, staffing, among others) for research libraries in Kenya be?
2. *Models of Library Services*
   a. Do you know the service model(s) currently employed by this library? Please, explain your answer.
   b. Are you aware of any other library service models? What are their advantages and disadvantages especially for this library (*explain the common models and their key characterization*).

c. How effective is the employed model in fulfilling the vision and mission of this library?

d. How is the applied model compliant to the provisions and requirements of the Freedom of Information Policy (2006), the Kenya National ICT Policy (2006), the Kenya Communications (Amendment) Act (2008) as well as the Harmonized Draft Constitution of Kenya (2009)?

e. Are there any social networks existing in the ecosystem of this library? What is their current impact? How can they benefit the library?

3. *Library 2.0.*

a. Have you heard of Library 2.0? *(Explain what Library 2.0 is and harmonize the views of the discussants)*

b. (i) Do you know any libraries which have implemented Library 2.0?
(ii) What lessons can this library learn from them, if any?

c. How do you compare Library 2.0 with the other models of library service with regard to research libraries?

d. What potential do you think it holds for this library?

e. What challenges are research libraries likely to face when implementing Library 2.0?

f. How best should it be implemented in this library and other research libraries?

4. *Services of the Library*

a. How are library services offered and the way they are delivered decided in this library?

b. Are the users involved in any way in this process? How?

c. What are the benefits of involving users in deciding the library services and how they are delivered?

d. What are the challenges likely to be faced in involving users in service design and delivery?

5. *Change in the Library*

a. Has this library implemented any change(s) in its services and/or how they are delivered in the last 3 years?

b. How often do you review the services and how they are delivered to the users?

c. How are the reviews conducted? Are the users involved? How?

d. What are the challenges faced in this process?

e. What would you recommend to make this process more successful?

6. *Library usage*

a. How do you rate the usage of this library by its target groups?

b. What factors do you think affect its usage?

c. Can these factors be changed so as to improve the usage? If your answer is yes, please indicate how this can be done in your view.

7. *Challenges to the libraries*

a. What is the single greatest challenge to this library?

b. How can this challenge be addressed?

c. What are the other challenges?

d. How, and to what extent, do these challenges affect the success of this library?

8. *Collaboration with others*

a. Does this library collaborate with other libraries? Please, explain.

b. Are there some collaboration ties this library currently has which you think should be changed or terminated? Please, explain.

c. Are there some collaborative relationships that you would recommend for this library? Please, explain.

d. What challenges is this library likely to face in these collaborative efforts?

e. What recommendations would you suggest to make these collaborations more beneficial?

9. *Is there anything you would like to add?*

Thank you for taking the time to share with us!!

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POTENTIAL OF LIBRARY 2.0 FOR RESEARCH LIBRARIES IN KENYA: MULTIPLE CASE STUDIES
FOCUS GROUP DISCUSSION QUESTIONS FOR USERS

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   c. Should the role definition change?
      i. How?
      ii. Why?
   d. How compliant do you think this library is with the provisions of the recent information legislations and policies such as the Freedom of Information Policy (2006), the Kenya National ICT Policy (2006), Kenya Communications (Amendment) Act (2008) as well as the Harmonized Draft Constitution of Kenya (2009)? *(Explain the key provisions that relate to access to information).*
2. *Services of the Library*
   a. What services do you like most in this library? Why?
   b. What services don't you like in this library? Why?
   c. Which new services would you wish to be added? Why?
   d. Which services would you wish to be phased out? Why?
3. *Information resources*

a. What do you consider as the most important information resource in this library? Why?

b. What do you consider as the least important information resource in this library? Why?

c. Which new information resources would you like to be acquired? Why?

d. Which information resources would you recommend for removal? Why?

4. *Library usage*

a. How do you rate the usage of this library by its target groups?

b. What factors do you think affect its usage?

c. Can these factors be changed so as to improve the usage? If your answer is yes, please indicate how this can be done in your view.

5. *Participation in library decisions*

a. Have you been involved in any way in contributing to important decisions for the library? How?

b. What is your perception of the involvement levels and processes? Are they adequate?

c. What would you say is your greatest personal contribution to this library?

d. Would you like to be involved more in deciding the services and their delivery in this library? How?

e. What are the major challenges likely to be faced by this library as it involves you and other users in decision making?

6. *Collaboration*

a. While using the library, do you collaborate with other users, librarians, social networks, libraries in any way? Please, explain.

b. How beneficial are these collaborations, if any?

c. Which new ones would you like to develop?

d. Which ones would you like to be terminated or changed? Please, explain.

7. *Challenges to the libraries*

a. What is the single greatest challenge to this library?

b. How can this challenge be addressed?

c. What are the other challenges?

d. How, and to what extent, do these challenges affect the success of this library?

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Appendix 5.4 – Mystery shopping scenarios

Mystery Shopping Scenarios

This data collection method will be used to assess matters relating to customer service by experiencing the services first-hand. The following scenarios will be acted by the mystery shoppers:

Scenario 1 – Attitude of the librarians towards library users

The mystery shopper should try to attract the attention of the librarian and the service counter and note the general attitude of the librarians towards the users e.g. courtesy, attention. The mystery shopper should stay until the time the library closes and note how users are asked to leave. Is there a bell? Are the lights switched off without explanation? Are the users threatened to be locked in for the night?

Scenario 2 – Depth of explanation of services

The mystery shopper should ask about the library services and the terms under which they are offered. The clarity and depth of explanations and/or instructions should be noted. The shopper should also ask more questions to probe the mastery of the librarians of the issues they are explaining. The mystery shopper should also note whether there are brochures or other aids and how appropriate they are.

Scenario 3 – Speed of services

The mystery shopper should ask for information resources on "sources of research funding in Kenya" and note how long it takes to get the resource or a satisfactory assistance.

Scenario 4 – Library systems

While in scenario 3, the mystery should also note whether the library has systems that effectively support the needs of users. These systems do not have to be computerized.

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1. **DEMOGRAPHICS**

    a. **Age:** ………………………………………………………….………..

    b. **Job Title** ……………………………………………………………………

    c. **Gender:**

    ☐ Male   ☐ Female
    d. **Education Level:**

    ☐ Diploma ☐ Bachelors ☐ Masters ☐ PhD ☐ Other

2. **LIBRARY MEMBERSHIP**

    a. Number of registered members: …………………………………………………

    b. Have there been any changes in the membership levels in the last 3 years? Yes ☐ ☐
    Please, explain your response.

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3. **LIBRARY SERVICES**

    a. Which service model are you employing in your library?

☐ Traditional

☐ Community

☐ Bookstore

☐ Library Outpost

☐ Mobile

☐ Embedded

☐ Information Commons

☐ Digital

☐ Library 2.0

Other (please, specify)…………………………………………………………
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b. Are you aware of any other library service models? Please, explain.

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c. What do you consider to be the core services of this library (please, tick the service that applies to you and rate its importance to you on a scale of 1 – 5 where 1 is most important and 5 is least important)?

Usage	Response (tick)	Importance				
Selective Dissemination of Information (SDI)		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Abstracting		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Reference services		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Provision of access to print scientific journals		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Provision of access of online scientific journals		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Access to books		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Access to newspapers		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Access to magazines		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Access to audio-visual resources (CD ROMs, DVDs, VCDs, etc)		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Access to the Internet		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Interlibrary loaning		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Other (please specify)						
		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

d. Is there any service(s) that the library does not offer but is being requested for by the users?

Yes ☐ No ☐

Please, explain.

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4. LIBRARY USAGE

a. About how many users visit the library on a monthly basis? Please, explain.

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b. Has there been any change – positive or negative – in the library usage in the last three or so months? Please, explain.

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c. What do you consider to be the major impediments to the effective use of the services of this library (please, tick the impediment that apply to you and rate its significance to you on a scale of 1 – 5 where 1 is most significant and 5 is least significant)?

Usage	Response (tick)	Importance
Obsolete collection		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Limited (quantity) collection		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Inadequate reading areas		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Unsuitable opening hours		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Few staff members		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Quality of services offered by staff members		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Low speeds of services		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Competition from other libraries		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Competition from the Internet		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Inappropriate reading culture among researchers		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Other (please specify)		
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
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		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5. LIBRARY CHALLENGES

What do you consider the major challenges this library faces and how they can be solved (please, tick the challenge that apply to you and rate its significance to you on a scale of 1 – 5 where 1 is most significant and 5 is least significant)?

Usage	Response (tick)	Importance (tick)	Possible Solution(s)
Understaffing		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
Low budget		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
Lack of appreciation by the parent organization		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
Other (please specify)			
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	
		☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5	

6. LIBRARY MANAGEMENT SYSTEM

a. What Library Management System does this library use?

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b. When was this system implemented?

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c. What do you consider the strongest features of the system? Please, explain.

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d. What do you consider the weakest features of the system? Please, explain.

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7. LIBRARY STRATEGY

a. (i) Does this library have a strategic plan? Yes ☐ No ☐

(ii) If Yes, when was it developed?

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(iii) How often is the strategic plan changed? Please explain.

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(iv) How are the users involved in developing or changing the strategic plans? Please, explain.

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(iii) If No, is a strategic plan likely to be developed in the next one year? Please, explain.

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b. What is the vision of this library? Please, explain.

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c. What is the mission of this library? Please, explain.

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d. Do you think the library has fulfilled its mission and vision? Please, explain.

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8. EVALUATION

a. Taking into account all the collection and services (delivered both offline and online) available at your library, how well do they meet current needs of the researchers?

Very well (excellent)	☐
Well (good)	☐
Satisfactory	☐
Not very well (poor)	☐
Not at all well (very poor)	☐

b. Please, explain your answer in (a) above.

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9. Anything you would like to add?

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    b. **Gender:**

    ☐ Male   ☐ Female

    c. **Education Level:**

    ☐ Diploma ☐ Bachelors ☐ Masters ☐ PhD ☐ Other

    d. **Area of research interest:**

……

……

2. LIBRARY MEMBERSHIP (tick appropriately)

a. Are you a member of this library? Yes ☐   No ☐

    1) If yes, for how long have you been a member?

    ………………………………………………………………………………………..

    2) Are you likely to stop being a member in the near future? Please, explain your answer.

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b. If you are not a member, would you like to be a member? Please, explain your response.

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3. USE OF LIBRARY

a. During the last three months:

3) You come to the library

☐ Daily ☐ Weekly ☐ Fortnightly ☐ Monthly ☐ Less than once a month

4) During each visit, you spend an average of

☐ Less than 1 hour ☐ 2 – 4 hours ☐ 5 – 7 hours ☐ 8 – 10 hours ☐ Over 10 hours

5) Considering your current research needs, how do you rate the time you spend in the library?

☐ Very Inadequate ☐ Inadequate ☐ Satisfactory ☐ Adequate ☐ Very Adequate

6) Is your usage pattern as above typical of the rest of the years? ☐ Yes ☐ No

b. Has your usage changed during the last 2-3 years? Yes ☐ No ☐

Please, explain your response.

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c. Do you see your level of library use changing in the next 2-3 years? Yes ☐ No ☐

Please, explain your response.

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d. What do you mainly use the library for (please, tick the category that apply to you and rate its importance to you on a scale of 1 – 5 where 1 is most important and 5 is least important)?

Usage	Response (tick)	Importance				
Borrowing books		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Accessing print journals		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Accessing online journals		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Reading online research papers		☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Reading your own literature		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Surfing the World Wide Web (web pages and search engines)		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Reading newspapers		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Reading magazines		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Using audio-visual resources (CD ROMs, DVDs, VCDs, etc)		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Using electronic bulletin boards		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Surfing blogs		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Accessing mailing lists and electronic bulletin boards		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Seeking assistance from the Librarian(s)		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
Other (please specify)					
		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5
		☐ 1	☐ 2	☐ 3	☐ 4 ☐ 5

e. Apart from the library, where else do you get information crucial for your current research projects from? Please, explain.

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f. Are these other sources of information (in (e) above) better or worse than the library? Please, explain.

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4. EVALUATION OF LIBRARY

a. Taking into account all the collection and services (delivered both offline and online) available at your library, how well do they meet your needs for your present research?

Very well (excellent)	☐
Well (good)	☐
Satisfactory	☐
Not very well (poor)	☐
Not at all well (very poor)	☐

b. Please, explain your answer in (a) above.

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c. Have any journals you consider crucial for your present research been cancelled in the past 3 years? If Yes, which ones?

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d. Are there any journals essential to your present research which your library does not subscribe to? If Yes, which ones?

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e. Over the past 3 years or so, would you say that your library has improved the following and how?

	Improved considerably	Improved somewhat	Remained unchanged	Deteriorated somewhat	Deteriorated considerably
Book collection					
Print journal collection					
Electronic journal collection					
Collection of research and conference papers					
CD ROMs, DVDs and VCDs collection					
Website					
Intranet					
Catalogues					
Internet connectivity and access points					
Other (please specify)					

f. Interlibrary Loan

1) Have you requested any services and/or materials through interlibrary loan?

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2) If Yes, how do you rate the following aspects of the service?

	Excellent	Good	Satisfactory	Poor	Very Poor
Response time					
Resource quotas (number of resources you can borrow at a time)					
Requisition Process					
Awareness of the resources held by the other libraries					
Level of automation of the process					
Loan periods					
Level of Support by Library staff					

g. Overall, how important is the library (in its present status) for your research project(s)?

Very important ☐
Important ☐
Satisfactory ☐
Unimportant ☐
Very unimportant ☐

h. Please, explain your answer in (g) above.

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5. PERCEPTION OF THE LIBRARY

a. What is the first thing that comes to your mind when you think of this library? Please, explain.

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b. What do you think the main purpose of this research library is?

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c. In your opinion, has your library achieved this purpose? Please, explain.

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d. What positive things do you associate with this library, if any?

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e. What negative things do you associate with this library, if any?

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6. RECOMMENDATIONS

a. What changes to the library collection or service would be of most benefit for your research interests and projects in the next 3 or so years?

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b. Anything you would like to add?

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Appendix 5.7 – Social Network Analysis questions

Social Network Analysis Questions

1) Do any social networks exist within and around the research institutions?

2) What are the key characteristics of the networks?

    a. How large are they?

    b. How many distinct clusters exist?

    c. How dense are they?

    d. Which researchers, libraries or institutions control the networks?

3) What are the trends in the growth and use of the networks?

4) How can the networks be used to support the creation and delivery of library services?

5) How can the networks be used to support knowledge management in and around the institutions?

Appendix 5.8 – Observation checklist

OBSERVATION CHECKLIST

Date……………………………………………………………………….

Site…………………………………………………………………………..

	OBSERVED	NOT OBSERVED	REMARKS
Library Premises			
Adequacy of the physical space in the reading areas			
Adequacy of the number of seats and/or tables			
Ventilation and/or air conditioning			
Cleanliness of the reading areas (floors, tables, chairs, shelves, etc)			
Ample parking			
Adequate lighting			
Noise			
Opening Hours			
Late opening			
Earlier closures			
Consistency of the schedule			
Resistance of the users to closures			
Library Services			
Simplicity of services			
Speed of service (queues)			
Complaints about services			
Self-service features			
Greetings			
Satisfaction of users with the services (feedback such as complaints or expressions of gratitude)			
Information Resources			
Quantity of collection			
Physical condition of collection			
Reservation of resources			
Classification of collection			
Display of new items			
Resources indicated as			

available in the catalogue but missing on the shelves			
Incorrectly shelved resources			
Un-shelved resources on tables			
Electronic Resources			
OPAC			
Internet access points			
Library website			
Online services			
Familiarity with digital services			
Actual use of the resources			
Library Usage			
Number of users coming into the library (will be combined to online usage as per the system logs)			
Peak usage times			
Low usage times			
Repeat users (will be identified by the researcher because he will spend one month in each case library)			
Reading of books			
Reading of newspapers			
Reading of own material			
Reading of journals			
Surfing online resources			
Borrowing books			
Reserving books			
Consulting librarians			
Using audio visual resources			
Borrowing audio visuals			

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Appendix 5.9 – FGD for head librarians workshop programme

Application of Web 2.0 Tools in Research Libraries in Kenya

Date: 10 September 2010

Venue: International Livestock Research Institute (ILRI), Nairobi Campus

Workshop Programme

Time	Activity	Facilitator/Presenter
9.00 – 9.15	Arrival and registration of the participants	Ms Grace Kamau
9.16 – 9.30	Introductions	Mr Tom Kwanya
9.31 – 10.30	Application of Web 2.0 tools in Research Libraries: my experience	Mr Peter Ballantyne
10.31 – 11.00	Tea Break	Ms Grace Kamau
11.01 – 12.00	Research Library 2.0 in Kenya – potential, realization and challenges : group discussion	Mr Tom Kwanya
12.01 – 12.30	The way forward	Tom Kwanya
12.31 – 1.00	Familiarization with ILRI Library	Milcah Gikunju
1.00 –	Lunch	Ms Grace Kamau

Appendix 6.1 – Social Network Analysis

Social Network Analysis on co-authorship

Search on ISI Web of Knowledge on the following databases (all documents, all languages) on 14 and 15 September 2010:

1. Science Citation Index Expanded (SCI-EXPANDED) – 1945 to present
2. Social Sciences Citation Index (SSCI) – 1956 to present
3. Arts & Humanities Citation Index (A&HCI) – 1975 to present
4. Conference Proceedings Citation Index- Science (CPCI-S) – 1990 to present
5. Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) – 1990 to present

Searching for organization:

1. KARI – 141
2. AMREF – 49
3. KEMRI – 461
4. ICRAF – 421
5. ILRI – 314

Combination for all the organizations

    0

KARI and AMREF

    0

KARI and KEMRI

    0

KARI and ICRAF

    2

Title: Vertical distribution of roots and soil nitrate: Tree species and phosphorus effects
Author(s): Jama B, Buresh RJ, Ndufa JK, Shepherd KD
Source: SOIL SCIENCE SOCIETY OF AMERICA JOURNAL   Volume: 62   Issue: 1   Pages: 280-286 Published: JAN-FEB 1998
Times Cited: 40
Title: CONTROL POLLINATION AND POLLEN MANAGEMENT IN SEBANIA-SESBAN (L) MERR
Author(s): OWUOR BO, OWINO F
Source: EUPHYTICA   Volume: 70   Issue: 3   Pages: 161-165   Published: 1993
Times Cited: 0

KARI and ILRI

    5

Title: Ecogeographical distribution of wild, weedy and cultivated Sorghum bicolor (L.) Moench in Kenya: implications for conservation and crop-to-wild gene flow
Author(s): Mutegi E (KARI), Sagnard F (ILRI), Muraya M (University of Hohenheim, Germany), Kanyenji B (KARI), Rono B (KARI), Mwongera C (International Crops Research Institute), Marangu C (KARI), Kamau J (KARI), Parzies H (University of Hohenheim, Germany), de Villiers S (International Crops Research Institute), Semagn K (International Crops Research Institute), Traore

PS (ICRISAT, Mali), Labuschagne M (University of Orange Free State, South Africa)
Source: GENETIC RESOURCES AND CROP EVOLUTION   Volume: 57   Issue: 2   Pages: 243-253 Published: FEB 2010
Times Cited: 0
Title: Risk of infection with Brucella abortus and Escherichia coli O157 : H7 associated with marketing of unpasteurized milk in Kenya
Author(s): Arimi SM (University of Nairobi), Koroti E, Kang'ethe EK (University of Nairobi), Omore AO (ILRI), McDermott JJ
Source: ACTA TROPICA   Volume: 96   Issue: 1   Pages: 1-8
Published: OCT 2005
Times Cited: 6
Title: Investigation of the risk of consuming marketed milk with antimicrobial residues in Kenya
Author(s): Kang'ethe EK (University of Nairobi), Aboge GO, Arimi SM (University of Nairobi), Kanja LW, Omore AO (ILRI), McDermott JJ (ILRI)
Source: FOOD CONTROL   Volume: 16   Issue: 4   Pages: 349-355
Published: APR 2005
Times Cited: 4
Title: Incorporating a water-logging routine into CERES-Maize, and some preliminary evaluations
Author(s): du Toit AS (ARC Grain Crops Institute, South Africa), Prinsloo MA, Wafula BM, Thornton PK
Source: WATER SA   Volume: 28   Issue: 3   Pages: 323-328
Published: JUL 2002
Times Cited: 1
Title: Resistance of Galla and Small East African goats in the sub-humid tropics to gastrointestinal nematode infections and the peri-parturient rise in faecal egg counts
Author(s): Baker RL, Mwamachi DM, Audho JO, Aduda EO, Thorpe W
Source: VETERINARY PARASITOLOGY   Volume: 79   Issue: 1   Pages: 53-64
Published: SEP 1998
Times Cited: 34

AMREF and KEMRI
    3
Title: A community randomized controlled trial of insecticide-treated bednets for the prevention of malaria and anaemia among primigravid women on the Kenyan coast
Author(s): Shulman CE, Dorman EK, Talisuna AO, Lowe BS, Nevill C, Snow RW, Jilo H, Peshu N, Bulmer JN, Graham S, Marsh K
Source: TROPICAL MEDICINE & INTERNATIONAL HEALTH   Volume: 3   Issue: 3   Pages: 197-204 Published: MAR 1998
Times Cited: 46
Title: INVITRO KILLING OF TAENIID ONCOSPHERES, MEDIATED BY HUMAN SERA FROM HYDATID ENDEMIC AREAS
Author(s): ROGAN MT, CRAIG PS, ZEHYLE E, MASINDE G, WEN H, ZHOU P
Source: ACTA TROPICA   Volume: 51   Issue: 3-4   Pages: 291-296   Published: AUG 1992
Times Cited: 18
Title: EVALUATION OF A RAPID DOT-ELISA AS A FIELD-TEST FOR THE DIAGNOSIS OF CYSTIC HYDATID-DISEASE
Author(s): ROGAN MT, CRAIG PS, ZEYHLE E, ROMIG T, LUBANO GM, DESHAN L
Source: TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND

HYGIENE   Volume: 85 Issue: 6   Pages: 773-777
Published: NOV-DEC 1991
Times Cited: 49
AMREF and ICRAF
    0
AMREF and ILRI
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KEMRI and ICRAF
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KEMRI and ILRI
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ILRI and ICRAF
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Title: Population genetic responses of wild forage species to grazing along a rainfall gradient in the Sahel: A study combining phenotypic and molecular analyses
Author(s): Jamnadass R, Mace ES, Hiernaux P, Muchugi A, Hanson J
Source: EUPHYTICA   Volume: 151   Issue: 3   Pages: 431-445
Published: OCT 2006
Times Cited: 0
Title: Assessing research impact on poverty: the importance of farmers' perspectives
Author(s): Kristjanson P, Place F, Franzel S, Thornton PK
Source: AGRICULTURAL SYSTEMS   Volume: 72   Issue: 1   Pages: 73-92
Published: APR 2002
Times Cited: 7
Title: Evaluating contingent and actual contributions to a local public good: Tsetse control in the Yale agro-pastoral zone, Burkina Faso
Author(s): Kamuanga M, Swallow BM, Sigue H, Bauer B
Source: ECOLOGICAL ECONOMICS   Volume: 39   Issue: 1   Pages: 115-130   Published: OCT 2001
Times Cited: 2
KARI, ICRAF and KEMRI
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Appendix 6.2 – Binary matrix of the relationships

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BETWEEN DATASET AGGREGATIONS
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Coauthorship has dimensions: 60 19 1


                 K I A K U I V E C R I I R A I E P A E
                 - - - - - - - - - - - - - - - - - - -
        Jama B   1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
     Buresh R J  0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0
       Ndufa J K 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0
    Shepherd K D 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0
       Mutegi E  1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
      Sagnard F  0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
     Kanyenji B  1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
        Rono B   1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
     Marangu C   1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
       Kamau J   1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
      Owuor BO   1 0 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0
       Owino F   0 0 0 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0
       Arimi SM  0 0 0 0 1 0 0 0 0 0 1 1 0 0 0 0 0 0 0
       Koroti E  0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0
    Kangethe EK  0 0 0 0 1 0 0 0 0 0 1 1 0 0 0 0 0 0 0
       Omore AO  1 1 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0
    McDermott JJ 0 1 0 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0
       Aboge GO  0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0
       Kanja LW  0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0
     du Toit AS  0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
    Prinsloo MA  0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
      Wafula BM  1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
    Thornton PK  0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 1 0
       Baker RL  0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
    Mwamachi DM  1 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
       Audho JO  0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
       Aduda EO  0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
       Thorpe W  0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0
    Shulman CE   0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
     Dorman EK   0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
    Talisuna AO  0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
        Lowe BS  0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
      Nevill C   0 0 1 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
        Snow RW  0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
        Jilo H   0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
       Peshu N   0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
      Bulmer JN  0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
      Graham S   0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
       Marsh K   0 0 0 1 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0
      Rogan MT   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0
      Craig PS   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0
      Zehyle E   0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 0
     Masinde G   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
         Wen H   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
        Zhou P   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
       Romig T   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
    Lubano GM    0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
      Deshan L   0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0
    Jamnadass R  0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0
       Mace ES   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
     Hiernaux P  0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
      Muchugi A  0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 1 0 0
       Hanson J  0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0
   Kristjanson P 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0
       Place F   0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0
      Franzel S  0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 1 0
    Kamuanga M   0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
     Swallow BM  0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1
       Sigue H   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
       Bauer B   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1
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Appendix 6.3 – Number of ties per researcher

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                      S
                      -
          Jama  B     2
      Buresh  R  J    2
       Ndufa  J  K    2
    Shepherd  K  D    2
        Mutegi  E     2
       Sagnard  F     2
     Kanyenji  B      2
          Rono  B     2
      Marangu  C      2
         Kamau  J     2
        Owuor  BO     2
        Owino  F      3
        Arimi  SM     3
        Koroti  E     2
    Kangethe  EK      3
        Omore  AO     4
   McDermott  JJ      3
        Aboge  GO     2
        Kanja  LW     2
     du Toit  AS      1
    Prinsloo  MA      1
      Wafula  BM      2
     Thornton  PK     3
        Baker  RL     2
    Mwamachi  DM      2
        Audho  JO     2
        Aduda  EO     2
        Thorpe  W     2
      Shulman  CE     2
       Dorman  EK     2
     Talisuna  AO     1
         Lowe  BS     2
       Nevill  C      3
         Snow  RW     2
         Jilo  H      1
        Peshu  N      1
       Bulmer  JN     1
       Graham  S      1
        Marsh  K      2
        Rogan  MT     2
        Craig  PS     2
       Zehyle  E      3
      Masinde  G      1
          Wen  H      1
         Zhou  P      1
        Romig  T      1
       Lubano  GM     2
       Deshan  L      1
    Jamnadass  R      2
         Mace  ES     1
     Hiernaux  P      2
      Muchugi  A      2
       Hanson  J      2
  Kristjanson  P      3
        Place  F      2
      Franzel  S      2
     Kamuanga  M      2
      Swallow  BM     2
        Sigue  H      1
        Bauer  B      1
```

Appendix 6.4 – Analysis of Centrality Measures

ID	*Mode	Degree	Betweenness	Closeness	Harmonic Closeness	Eigenvector	2-Local Eigenvector
Jama B	Rows	2	22.117	2238	17.967	0.077	15
Buresh R J	Rows	2	18.439	2254	17.06	0.089	14
Ndufa J K	Rows	2	22.117	2238	17.967	0.077	15
Shepherd K D	Rows	2	18.439	2254	17.06	0.089	14
Mutegi E	Rows	2	5.472	2240	17.717	0.092	17
Sagnard F	Rows	2	60.465	2218	19.85	0.173	20
Kanyenji B	Rows	2	5.472	2240	17.717	0.092	17
Rono B	Rows	2	5.472	2240	17.717	0.092	17
Marangu C	Rows	2	5.472	2240	17.717	0.092	17
Kamau J	Rows	2	5.472	2240	17.717	0.092	17
Owuor BO	Rows	3	124.864	2210	21.033	0.145	23
Owino F	Rows	2	12.127	2258	16.56	0.084	12
Arimi SM	Rows	3	14.798	2274	15.8	0.095	16
Koroti E	Rows	2	7.19	2276	15.133	0.055	10
Kangethe EK	Rows	3	14.798	2274	15.8	0.095	16
Omore AO	Rows	4	329.111	2188	24.083	0.279	36
McDermott JJ	Rows	3	112.086	2214	20.65	0.219	25
Aboge GO	Rows	2	6.946	2276	15.133	0.058	11
Kanja LW	Rows	2	6.946	2276	15.133	0.058	11
du Toit AS	Rows	1	0	2290	13.443	0.015	4
Prinsloo MA	Rows	1	0	2290	13.443	0.015	4
Wafula BM	Rows	2	56.763	2234	18.35	0.075	15
Thornton PK	Rows	3	126.52	2216	20.517	0.189	22
Baker RL	Rows	2	11.001	2226	18.85	0.184	19
Mwamachi DM	Rows	2	31.099	2234	18.467	0.102	16
Audho JO	Rows	2	11.001	2226	18.85	0.184	19
Aduda EO	Rows	2	11.001	2226	18.85	0.184	19
Thorpe W	Rows	2	11.001	2226	18.85	0.184	19
Shulman CE	Rows	2	6.071	4418	10.117	0	18
Dorman EK	Rows	2	6.071	4418	10.117	0	18
Talisuna AO	Rows	1	0	4432	8.733	0	11
Lowe BS	Rows	2	6.071	4418	10.117	0	18
Nevill C	Rows	3	66.976	4406	11.417	0	20
Snow RW	Rows	2	6.071	4418	10.117	0	18
Jilo H	Rows	1	0	4432	8.733	0	11
Peshu N	Rows	1	0	4432	8.733	0	11
Bulmer JN	Rows	1	0	4432	8.733	0	11
Graham S	Rows	1	0	4432	8.733	0	11
Marsh K	Rows	2	6.071	4418	10.117	0	18
Rogan MT	Rows	2	10.333	4428	9.2	0	12

Craig PS	Rows	2	10.333	4428	9.2	0	12
Zehyle E	Rows	3	65.238	4412	10.667	0	14
Masinde G	Rows	1	0	4448	7.233	0	6
Wen H	Rows	1	0	4448	7.233	0	6
Zhou P	Rows	1	0	4448	7.233	0	6
Romig T	Rows	1	0	4436	7.783	0	6
Lubano GM	Rows	2	73.762	4410	10.5	0	13
Deshan L	Rows	1	0	4436	7.783	0	6
Jamnadass R	Rows	3	84.731	2206	21.533	0.253	29
Mace ES	Rows	1	0	2302	13.06	0.038	5
Hiernaux P	Rows	2	25.745	2224	19.1	0.18	19
Muchugi A	Rows	2	17.603	2252	17.31	0.111	15
Hanson J	Rows	2	25.745	2224	19.1	0.18	19
Kristjanson P	Rows	3	71.242	2208	21.283	0.247	28
Place F	Rows	2	8.133	2250	17.11	0.105	14
Franzel S	Rows	2	8.133	2250	17.11	0.105	14
Kamuanga M	Rows	2	51.871	2224	19.1	0.164	18
Swallow BM	Rows	3	138.611	2204	21.783	0.237	28
Sigue H	Rows	1	0	2302	12.893	0.022	4
Bauer B	Rows	1	0	2302	12.893	0.022	4
KARI	Columns	11	426.618	2192	25.767	0.145	25
ILRI	Columns	14	677.578	2178	28.417	0.34	35
AMREF	Columns	2	56.238	4409	10	0	6
KEMRI	Columns	7	93.429	4407	12.683	0	15
UON	Columns	5	7.19	2318	14.638	0.043	12
ICRAF	Columns	10	315.698	2208	23.983	0.175	24
Vertical distribution of roots and soil nitrate	Columns	4	37.111	2256	17	0.04	8
Ecogeographical distribution of Sorghum bicolor	Columns	6	50.825	2244	18.867	0.075	12
Control pollination and pollen management in sebania-sesban	Columns	2	7.031	2260	15.667	0.027	5
Risk of infection with Brucella abortus and Escherichia coli	Columns	5	116.968	2230	19.45	0.089	15
Investigation of the risk of	Columns	6	171.683	2228	20.117	0.096	17

consuming marketed milk Incorporating a water-logging routine into CERES-Maize	Columns	4	117.527	2238	18.317	0.035	7
Resistance of Galla and Small East African goats	Columns	5	34.103	2246	18.2	0.1	10
A community randomized controlled trial of insecticide-treated bednets	Columns	11	120.667	4409	14.567	0	18
Invitro killing of taeniid oncospheres	Columns	6	70.667	4425	10.833	0	10
Evaluation of a rapid dot-elisa as a field-test	Columns	6	96	4413	11.75	0	11
Population genetic responses of wild forage	Columns	5	72.439	2250	17.933	0.091	10
Assessing research impact on poverty	Columns	4	36.629	2246	17.783	0.077	10
Evaluating contingent and actual contributions	Columns	4	105.598	2250	17.4	0.053	7