

**AN ANALYSIS OF THE CHANGE MANAGEMENT APPROACHES IN  
THE IMPLEMENTATION OF AN AUTOMATED LIBRARY INFORMATION  
SYSTEM AT THE CATHOLIC UNIVERSITY OF EASTERN AFRICA,  
NAIROBI, KENYA**

**BY**

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INFORMATION STUDIES**

**MOI UNIVERSITY  
ELDORET**

**NOVEMBER, 2015**

## DECLARATION BY THE CANDIDATE

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## **DEDICATION**

I dedicate this work to my Mother-Phylis Muema, my husband Silvester Mwendwa, and children: Samuel, Beatrice, and Daniel for their inspiration and moral support they accorded me to ensure the accomplishment of this thesis.

## ABSTRACT

Despite the cost and the demands involved in the implementation of automated library systems, Catholic University of Eastern Africa (CUEA) library has used three automated library systems within the last eleven years. These systems have neither been fully implemented nor fully deployed. Planning and implementation of these systems has continuously been an involving and complicated endeavor, as each new system is introduced. At some point the three systems ran concurrently. The aim of the study was to investigate change management approaches in the implementation of automated library system(s) in CUEA University Library; with a view of making recommendations for successful IS implementation. The objectives of the study were to: map and audit the application of automated library system in the library; determine factors that necessitated the need for automated library system change in each occasion; examine approaches/procedures used in the automated system implementations; establish the responses of the library staff and users towards automated library systems and their subsequent library operations and services; investigate the challenges experienced in the implementation of automated library systems, and make recommendations for successful automated system implementation at CUEA library. The study was informed by Nolan, Lewin's and Kotter theories of change management. The study adopted qualitative research design. Purposive and snowball sampling methods were employed to collect data from 67 subjects drawn from the top library management, ICT department of the university, and CUEA library staff and users. Data was collected using face to face semi structured interviews and focus group discussions. It was analyzed thematically and presented through use of descriptive narratives and tables. Main findings show that, rapid technological changes, system change resistance, inadequacy of skills in system implementation and poor change management strategies among others are some of the challenges libraries face while managing change in automated system implementation. The study recommends enhanced communication and training about the systems across all library staff and users; user participation and involvement in the system implementation; knowledge sharing between librarians, within and external to the university, on their system implementation experiences and strategies; diligent and consultative vendor terms assessment; and adoption of a realistic automation project plan.

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**LIST OF ABBREVIATIONS & ACRONYMS**

<b>ALS</b>	:	Automated Library Systems
<b>HCI</b>	:	Human Computer Interaction
<b>ICT</b>	:	Information and Communication Technology.
<b>ISs</b>	:	Information Systems
<b>IT</b>	:	Information Technology
<b>CUEA</b>	:	Catholic University of Eastern Africa
<b>LIMS</b>	:	Library Management Information System
<b>RFID</b>	:	Radio Frequency Identification
<b>ILS</b>	:	Integrated Library System
<b>UL</b>	:	University Librarian
<b>DUL</b>	:	Deputy University Librarian

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## CHAPTER ONE

### INTRODUCTION AND BACKGROUND INFORMATION

#### 1.0 Introduction

Cuttence (2001) avers that the integration of ICT into all major social institutions and organizations is now imperative rather than optional if clientele and staff are to be equipped with pre-requisite capacity to understand, utilize, and functionally operate in such environments. Libraries today integrate multiple and diverse information technologies in all areas of their services provision. As one of the technologies, an automated library system is a primary driver of change in the ways that people work, seek and retrieve information, communicate, and entertain themselves. Yet as technology continues to change at a rapid pace, with no sign of slowing down, implementing something new—such as an automated library system—has dynamic change effects and requires strategic approach. For it to bring about effective change, change management is prerequisite.

Harvard Business Essentials (2003) points out that change is a process and not a destination. It never ends regardless of how successful an organization or an individual is, there is always tomorrow. Williams & Williams (2007) state that change process is a series of overlapping phases. On their part, Price & Chahal (2006) state that it is not an event; but rather a continuous occurrence. It is widely acknowledged that once a far reaching change takes place within an organization, everywhere in the organization does not instantly change, rather the change is experienced in phases over time. For instance, if a library automated Information System (IS) is changed, certain steps need to be taken in

order to actualize the target outcome. Price & Chahal (2006) assert that change always requires a strategy. Change, they write, can arise due to need for survival, inadequacy in resources, customer expectations, pursuit of relevance and desire for efficiency.

On one hand, Sababu (2007) views change as the business environment which overtakes many organizations transitional strategy. Hence, he calls on every organization to create strategies, manage, master ways, and survive the effects of change. Sign (2010) on the other hand sees change as the coping process of moving from the present state to a desired state. This process, he writes, individuals, groups and organizations undertake in response to dynamic internal and external factors/forces that alter current realities.

The fact that organizations must undergo continual change does not however mean that people enjoy the process, or that the experience of change is pleasant. On the contrary, change is often disheartening, frustrating, disruptive, and traumatic and generally leaves a number of casualties in its wake—leading to many people, resisting, fighting and avoiding it if they can (Harvard Business Essentials 2003). Harvard Business Essentials (2003) notes that nevertheless those who know how to anticipate it, catalyze it, and manage it find their careers, services and organizations more rewarding, fulfilling, satisfying and successful.

In recent years, change in the library environment has become inevitable. According to Hamid (2002), libraries, like many other institutions, have experienced change at an

unsteady rate. Coping with change has become a topic for discussion and informal conversations among colleagues in libraries. He notes that nearly every library, has experienced at least one change—either, a library has implemented the initial automation of their functions with Online Public Access Catalogues (OPACs) or has migrated from manual systems to automated and from older automated to newer or more sophisticated systems. This has been brought about by the need to remain relevant and survive the technological onslaught as new advancements in information technology emerge, the need to adopt more effective and efficient means in their service delivery, and changing information needs by information seekers put libraries in an unenviable position.

### **1.1 Perspectives of Change Management**

Like the above diversified perspectives of the concept of ‘change’ many authors have contributed to the conceptual understanding of what change management is, its scope and focus. A sample of selected definitions from the literature provides these arrays of change management theories that underpin its meaning on both organizational and individual level.

*“.... The process of achieving smooth implementation of change by planning and introducing it systematically, taking into accounts the likelihood of it being resisted” (Armstrong 2009)*

*“...change management is a structured approach to transitioning individuals, teams and organizations from a current state to a desired future state” (Sacheva, 2009)*

*“...change management is an organizational process aimed at empowering employees to accept and embrace changes in their current business environment” (Hiatt, 2010)*

Collectively however, they agree that change management is a systematic approach to dealing with change, both from the perspective of an organization and an individual.



Specific common denominators in change management include the acknowledgement that:

- a) Change management is systematic;
- b) Change management is a progressive process;
- c) Change management is transformative as it moves from a current state to future/desired state;
- d) Change management is an embodiment of employees to deal and cop with effects of change and its subsequent effects.

Subsequently, Pott and LaMarsh (2004) define change management as a systematic process of applying the knowledge, tools, and resources needed to transform an organization from its current state to a future desired state as defined by its vision. Kotter (1996) goes further to identify three different aspects of change management:

- a) Adapting to change
- b) Controlling change
- c) And effecting change

According to Kotter (1996), a proactive approach is necessary in dealing with change at the core of all the three aspects.

Apostolou et. al. (2011), acknowledges change management as a critical success factor in software systems implementation, while Kemp & Low (2008), suggest that change management should focus on creating an environment in which the change can be implemented.

Consequently, technological change is a reality that librarians and other information professionals must constantly cope with in order to remain relevant. A successful library automation project depends on good management. Library management requires attention to a wide variety of strategies and techniques in order to embrace change caused by library automation. How library managers deal with the major factors that need to be considered in this changing environment, will largely determine how successful coping with resultant effects of change will be.

## **1.2 Role of Change Management in the Implementation of an Automated Library Systems**

O'Brien and Marakas (2010), stated that an, information system implementation project is a complex process that every so often ends in failure. As such, managing information system implementation deserves a very high degree of attention. According to them, IT-related project management is virtually impossible without taking change into consideration. Changes, therefore, they conclude, are inevitable, and should by no means be neglected in Information System (IS) development and implementation.

Fortunately, there is a growing realization by many libraries that change management is key to effective library management and that information technology (IT) is one of the most important and vital component for success in any information center. These changes, as Milis & Mercken (2002) in agreement with Kemp & Low (2008) observe, can either be within the system or change provoked by the outcome of the system.

Change within the system refers to the requirements or the specifications of a system change that arise when new challenges arise out of the current system and the system is in turn expected to react. Unfortunately, this can create confusion among the parties involved and in some cases can even drive the stakeholders into panic, thus underscoring the need for change management.

Williams & Williams (2007) observed that people respond to change more positively when they have an understanding of its purpose and consequences. This necessitates need for inclusion before an impending change is effected and embraced. That way, issues of staff resistance to change will be avoided. Therefore, change being a continuous process, has to be handled carefully in order to maintain smooth running of library as well as to improve on library services provision to patrons.

Hammoud (2008) explains that any new information system implies—and brings—changes in processes, operations, policies, or business. Change management helps in defining these changes, quantifying them, and planning for their execution. The author adds that projects that implement change have potential and better chances for success and exponential growth.

Change provoked by the outcome of the system on the other hand, means that the existing system has failed in delivering the library expectations; necessitating the library to adopt a new and more robust system. Of equal importance is initiating positive attitude among the users of this new technology. For an IT system, according to Kemp & Low (2008),

change management is needed to prepare users for the introduction of the new system, to reduce any potential resistance to change during the project, and to influence the attitudes of the users towards the new system.

Despite the acknowledgment of the role of IT in successful business function of libraries, there still is a widespread fear of change and cynicism about change among many people who might expect to benefit from it (Pandey 2000). Thus, librarians and library managers must cultivate a more positive attitude towards change in libraries. Only then can libraries begin to achieve the real benefits of new technology.

Several documented works underscore this significance. These works argue that IT projects in libraries are normally handled and managed haphazardly. Yeats and Wakefield (2004), for instance, attribute failures of computer systems in delivering the benefits for which they were designed for to one important reason—overlooking people. They suggest keener study of human computer interaction (HCI) when a new library information system is to be implemented. Kavanagh and Thite (2009) are of similar view. They argue that failure in successful implementation of information systems has less to do with hardware or software aspects of the new system and more to do with the skills of the change leader, people affected and effecting the change as well as organizational issues related to this change. In agreement, Legris & Collette (2006), state that most ICT system adoption failures are due to poor management of implementation process. Further, they explain that emphasis is ever so often on the technical side rather than human input. According to them, the reverse should be more emphasized. Additionally,

these authors suggest that management and people are the biggest obstacles in a system. It can be poor management in general as suggested by Legris & Collette (2006), lack of sufficient communication and underestimation of required retraining (Price & Chahal 2006), or incapability of managing system uncertainty (Asllani & Etkin 2007). The list is long and the authors give different names to the problem, but they all come down to one common factor—management. Thus, the role of human factor in change management of a library automated system cannot be underestimated or overlooked.

The challenges of managing change in implementing automated library systems at university libraries is an issue that needs to be addressed in order to guarantee project success. Success will also be ensured in their application in information centers. Otherwise, one can only see the current automated projects—OPACS and WEB OPACs, internet services and e-resources—as technically obsolescent in the future. Needless to say therefore, a critical factor in achieving rapid and complete adoption of new technology is effective change management. Unfortunately, too many change initiatives fail to deliver their promised value as a large percentage of change efforts end in discouraging results.

CUEA library has embraced automated library system in their service delivery. However, it is necessary to decide, plan and strategize the progressive transition process. Managing change during this transition state is a critical phase in the change process. It is here that the problems of introducing change measures emerge. These challenges have to be managed and dealt with effectively. The challenges include: resistance to change,

instability of operations, low productivity and high levels of stress, misdirected energy, conflict and loss of momentum. Therefore, there is need to do everything possible to anticipate reactions and likely impediments to the introduction of change in Information system (IS) implementation.

### **1.3 Bishop McCauley Memorial Library**

Bishop McCauley Memorial Library history is as old as the early planning stages of establishing CUEA. IN 1961, the Catholic Bishops of the Association of Member Episcopal Conference of Eastern Africa (AMECEA) brainstormed on the possibility of establishing a Catholic University in order to bridge education gap in the country and the region as well. 12 years later, in 1973, AMECEA accepted, in principle, Rome's recommendations to set up a college in the country with an aim of addressing the needs of African students in the AMECEA region. It was found more prudent, at this point in time, to first establish a college and observe its growth before coming up with a catholic university.

Consultations on the establishment of a catholic university, however, progressed slowly and the college remained in operation for close to a decade. In 1980, however, His Eminence, Angelo Cardinal Rossi sent an official approval letter to the planners for the establishment of two higher learning institutions in East and West Africa.

With the approval, the AMECEA Bishops created facilitative structures and mandated a group of personnel to begin earnestly planning the establishment of a Catholic Higher Institute of Eastern Africa (CHIEA). This was the precedent institution before CUEA.

An academic institution was to definitely require a library in order to support knowledge dispensation and thus a library fund set aside. Fr. Victor Coulombe (S. J.) was appointed the first librarian.

Worth noting is that the library had been initially serving jointly CHIEA and St. Thomas Aquinas Seminary, Nairobi. As a joint library, it was officially opened on 23<sup>rd</sup> August 1983.

Since then, the university library has been redesigned several times to accommodate the growing user population and collection of information resources. In May 2008, the university embarked on construction of an ultra Modern Learning Resource. The library moved to the new building in September 2012

### **1.3.1 Vision**

In its vision, the university defines its role as an academic and formative agent for creating and acquiring knowledge as well as producing graduates who are competent leaders for the Church and society. Guided by the university vision, the library seeks to play its role as a resourceful information center for all its patrons.

### **1.3.2 Mission**

The Library support scientific research relevant to academic endeavors and informational needs of its users, provide comprehensive collection of printed and electronic information materials, equipping itself with appropriate information communication technologies, and by engaging in inter-library loaning/ resource sharing within and without the university.

### 1.3.3 CUEA University library Objectives

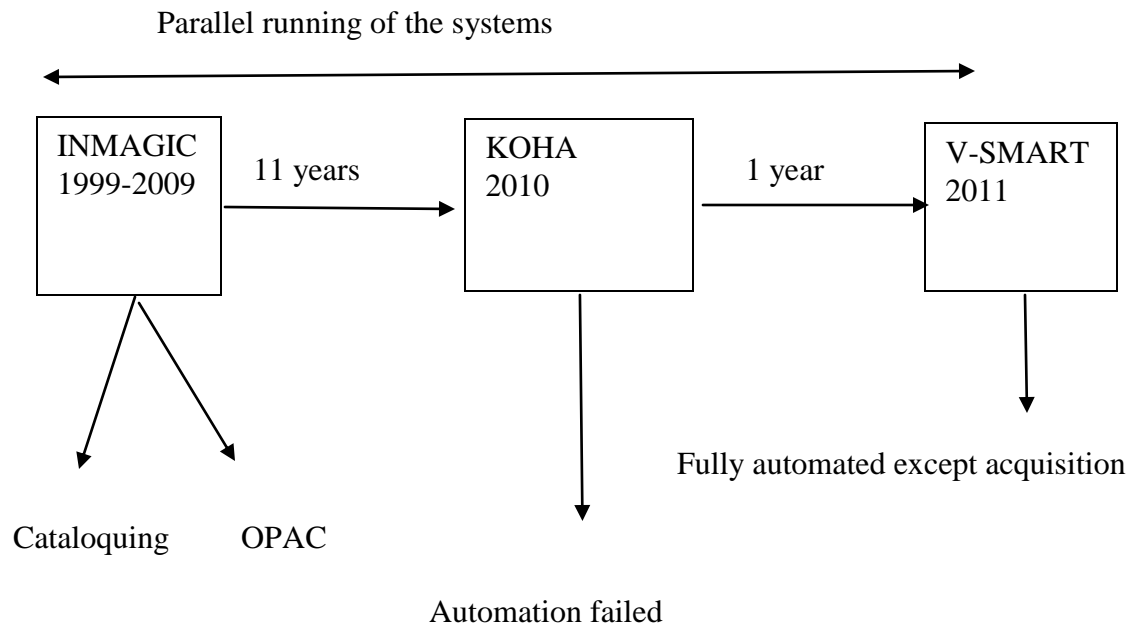
This includes;-

- To Support scientific research, quality teaching and community service
- To avail informational materials, in both print and electronic format
- To provide library Services , e.g. circulation, CAS, SDI
- To assist students in Information referencing
- To ensure Implementation of new technological novelties relevant to service provision at the library
- To create an enabling environment for research and study
- To cultivate a lifelong learning culture in the university

In striving to achieve these objectives, in 1999 the library automated its information services using **Inmagic Software system** but had difficulties in its attempts to achieving full application thereby limiting it only to cataloguing and OPAC. The library then decided to change the system from Inmagic to KOHA in the year 2009. **Koha Software** was thus acquired in 2010 and used up to late 2011 in parallel application with Inmagic. However, in the course of the KOHA implementation process, a number of issues about the system were noted that necessitated a new system. **Vubis Smart (V- smart)** a web – based Integrated Library System (ILS), was acquired in late 2011, purchased with the modern library in mind as it was envisaged that it would handle and support information services on a 24/7 hour basis. However, at one point in time in the cause of its implementation, all three systems (INMAGIC, KOHA and V-SMART) were used together as a way of gauging their suitability and advantages. At present, though V-smart



is fully functional, except acquisitions, and is anticipated that it will expedite the library service delivery and consequently ease library chores, it is still under evaluation.



**Figure 1.1: Systems Implementation History at CUEA University Library**

#### 1.4 Statement of the Problem

Automated system change is not a one-time easy task. It is a process that needs careful planning, motivation, and professional execution. Like any other system migration, the successful implementation of a library automated Information System (IS) involves a number of steps before the expected outcome can be realized. According to O'Brien (2009) these phases may include, analysis, and design stages of the system development life cycle, hardware and software acquisition, software development, testing of programs and procedures, conversion of data resources, and a variety of conversion alternatives. It also involves system selection, implementation planning, system profiling, publicity, education and training of end users and

specialists who will operate the system. Consequently, the expected life of a computer system is about five years (Ali 2004), thus the danger of technological obsolescence.

Yet at CUEA university library, even though automation started 1999 using **Inmagic**, only cataloguing processes and OPAC were automated. Other library operations such as circulation among others remained manual implying that the library failed to benefit maximally from its adoption. KOHA which was adopted thereafter in 2010 was similarly replaced with V-smart in 2011, a one year transition period only. Notably also is that these systems were all left to run parallel to each other. With the exception of V-smart which has been fully implemented except its acquisition module, the older two systems were significantly under deployed.

This raises questions as to what necessitated these rather rapid changes, how has this impacted on the library service provision and users, and how can the library successfully implement and efficiently use a new automated library system, among other queries.

### **1.5 Aim of the Study**

The aim of the study is to investigate change management approaches in the implementation of automated library system(s) in CUEA University Library; with a view of proposing recommendations for successful IS implementation.

### **1.6 Objectives of the Study**

1. To audit the application of automated library systems in CUEA library
2. To determine reasons that necessitated automated library system change in each occasion

3. To examine approaches/procedures used in automated system implementation at CUEA library
4. To establish the attitudes of CUEA library staff and users towards automated library systems and subsequently library operations and services
5. To investigate the challenges experienced in the implementation of automated library system in CUEA library
6. To make recommendations and develop framework for successful automated system implementation at CUEA library

### **1.7 Research Question**

This research will be guided by the following research questions;

1. How is the automated system used in support of CUEA library operations and services?
2. What were the reasons for change of CUEA library systems?
3. How have the current and past systems been implemented?
4. What is the perception and attitudes of library staff and users towards automated library systems?
5. What challenges negate successful system implementation in the library?
6. How can the library walk through a successful automated library system implementation?

## **1.8 Assumptions**

The study assumes that frequent change of automated library information systems at CUEA University library can be attributed to poor change management strategies.

## **1.9 Significance of the Study**

Firstly, this study is expected to provide a basis for comprehensive information gathering on change management strategies in the implementation of automated library system at CUEA university library. It provides a platform for CUEA librarians to report their failures and successes in adapting to technological change. This will help others learn the do's and don'ts of LIS implementation hence ensuring the library remains relevant in the ever so often changing technological environment.

Secondly the research is expected to recommend ways of solving problems experienced in automated system implementation at CUEA library and propose change management strategies for successful IT implementation. Last but not the least, the outcome of this study is expected to have an implication on the following major stakeholders;

**Library leaders:** The output of the study may also be useful for other libraries as reference sources as they plan and implement automated library information systems.

**Researchers:** The study will extent the theoretical validity and applicability to existing knowledge on change management and automated systems implementation

Educators: Recommendations developed from this research will also be useful to library and Information sciences educators. This includes empirical references for information professionals that can be used to provide students with the dynamics of systems implementation.

### **1.10 Scope the Study**

The study focused on salient issues related to change management strategies in the implementation of automated Information System in CUEA library. The subject of the study was Catholic University of Eastern Africa (CUEA) library located in Nairobi along Lang'ata—Karen Road. The study focused on general users of CUEA library, faculty members, the ICT department and library staff.

### **1.11 Limitations of the Study**

The research was banking on staff's and users' recollection of previous occurrences in regard to change of library systems. This proved a limitation as some staff had left while older students had since gone out as alumni. Secondly, dependency on human recall of past events from both staff and students may not be foolproof and comprehensive enough.

Thirdly, determination of adequacy or inadequacy of the library systems acquired by CUEA was solely the perceived opinions of the respondents which could be subjective.

### 1.12 Definition of Operational Terms

**Change:** To alter, make difference or cause to pass from one state to another.

**Change management:** It is a process of achieving the smooth implementation of change by planning and introducing it systematically, taking into account the likelihood of it being resisted.

**Strategy:** It is a method or plan chosen to bring about a desired future, such as change of a library Information System

**Automated library system:** this is a technological set-up consisting of hardware, software, data and the people who use them. Human Computer Interaction (HCI) is important for success of an automated library system.

**Library automation:** This refers to use of computerized/automated systems in the library to perform library operations which were previously carried out manually

**System migration:** This is change or transition from one system to another.

### 1.13 Chapter Summary

This chapter has discussed change as a process and outlined the role of change management in the implementation of automated information systems in libraries. It has extensively provided the background information of CUEA library as well as providing evidence of the rapid changes taking place in regard to automated information systems. Other key areas mentioned include statement of the problem, aims, objectives, significance, scope and limitations of the study. It is evident from the literature cited that change management is the most critical factor in the implementation of automated information systems. The next chapter offers a review of the literature and theories related to change management.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

The chapter deals with related literature on change management strategies in ICT system implementation. It reviews some of the primary, secondary and tertiary literature such as books, journals, internet, e-resources and dissertations related to change management strategies in the implementation of automated library systems. It also analyzes the theoretical framework upon which the study is based. It also examines three theories of change, which include: Nolan, Norton S-Curve IS model (1976), Lewin's Change model (1946), Kotter's process of leading change model (1996).

Adopting a thematic approach in the review, the work is organized around topics, issues or themes pertinent to the subject area such as: change management concept; application of automated library system in libraries; Users response towards new innovations (library systems); impediments to system migration and implementation and critical success factors in system implementation.

#### **2.1 Theoretical Framework**

According to Collins and Hussey (2003), a theoretical framework is a collection of theories and models from the literature. It serves to answers two basic questions. (a) What is the problem and (b) why is your remedy approach the most feasible solution? According to Collins and Hussey (2003), the answer to these two questions can only be obtained through a review of the literature. Expanding on these, Kemon (2008) provides four purposes of theories in scientific research: description, explanation, prediction and

control. He explains that theories generate new knowledge and hypotheses about behavior that could be confirmed or contested through research. Research, he asserts, can reveal weaknesses in a theory and force researchers to modify or develop a new and more comprehensive theory.

Despite the undisputed fact that successful management of change is crucial to any organization/library in order to succeed in the competitive and continuously evolving business environment, Guimaraes and Armstrong (1998) aptly observe that while there is an ever growing general literature emphasizing the importance of change and suggesting ways to approach it, very little empirical evidence has been provided in support of the different theories and approaches suggested. In addition, theories and approaches at change management currently available to academics and professionals are often contradictory. Most lack empirical evidence and are supported by unchallenged hypotheses concerning the nature of contemporary organizational change management (Guimaraes and Armstrong (1998). Burnes (2004) further observes that many theories and models relating to the management of organizational change have evolved from the social sciences. Information Systems (IS) research is a much new discipline. Nevertheless, the socio-technical nature of information systems is now recognized and many of the IS theories and models have been adopted and adapted from the social sciences (Yetton et al, 1994 and Benjamin and Levinson, 1993).

The theory of change management draws on a body of research from areas such as group dynamics and organizational development, as well as ideas based on the



practical experience of managers (Yeats and Wakefield, 2004). It is not as much concerned with the rights and wrongs of any particular change as it is with the process of change itself. The research therefore acknowledges that there are several theories applicable to understanding the process of change, and defining change management. Such theories include:

- Nolan, Norton S-Curve IS model(1976)
- Lewin's Change model (1946)
- Kotter's process of leading change model(1996)
- Nadler's Congruence Model (1998)

According to Nadlers Congruence model (1998), one of the key steps in understanding and managing change is to first understand the dynamics and performance of the organization. He observes that, without this understanding of the varied issues affecting performance, successful change may be misdirected by focusing on the symptoms rather than the true causes of a problem. Cameron and Green (2004) observe that, this model is particularly good in pointing out in retrospect why changes did not work, which although psychologically satisfying is not always a productive exercise. The model is problem-focused rather than solution focused, and lacks any reference to the powerful effects of a guiding vision, or to the need for setting and achieving a goal.

In this study the three -models/theories ( Nolan, Lewin's and Kotter's) complement each other in investigating how change management strategies can be applied for successful implementation of automated Information System in CUEA University.

Kotter (1996) model is associated with the power-influence leadership school of thought—as it emphasizes the application of human relations skills. However, Lewin (1996) model examines behaviors central to the new style of working and perceptions of individuals; thus associated to school of behavioral psychology/ Organizational Behaviour. Both these models focus on sequential steps that organizational change can be planned and managed through. Nolan (1976) is concerned with the general approach to IT in business. Nolan (1976) is a theoretical model for the growth of information technology (IT) in a business or organization. The model provides guidelines to managers and analytically explains the complex nature of IS development. It aids them in planning and managing IS resources. An analysis of the three used models is given below.

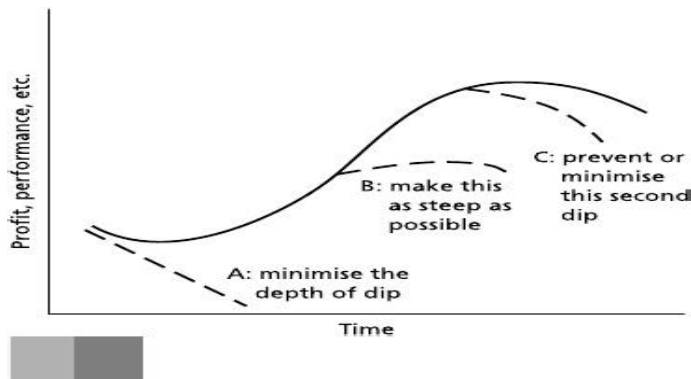
### **2.1.1 Nolan's, Norton S-curve IS Model (1976)**

IT within an organisation is seen here as going through several stages of growth. Each stage has its own distinctive applications, rewards, and problems. Each stage is managed in a way sensitive to the issues at that stage as well as issues that arise in the subsequent stage for optimum benefit from IS/IT to be realised.

In explaining what happens in the change process of ICT system implementation, Yeats and Wakefield (2004) used the S-curve model. In the model, *x axis represented time and y axis performance, profits and happiness* (figure 2.1). The authors observed that after implementation of a new system, first performance dips as change disrupts status quo. Gradually, the organization realizes benefits from the change, but after a while there

tends to be a leveling-off, as people accept change. There might even be a slight decline in performance. At this point the organization tends to start its next change. The authors argue that change management is about optimizing the curve with little or no concern as to whether the change is the right one. The change management therefore aims at:

- Minimizing the depth of the dip, A, on the diagram;
- Optimizing the angle of ascent, B on the diagram, so as to
- Prevent or minimize the second dip, C, on the diagram



**Figure 2.1: The Nolan, Norton S-curve IS model (1974)**

*Source: Yeats & Wakefield (2004 pg 437)*

The disadvantage of this model is that it concentrates on optimizing the curve rather than checking whether the change is the right one. Other factors including people are ignored in the change process thus benefits accrued are likely to be short-lived hence change failure.

However, this model concentrates on performance and thus has a guiding vision that makes change continuous; therefore making it effective in the turbulent technological

environment. Inadvertently though, the change does not work and people revert to their old ways of working because they feel no motivation to change. Change is not embraced.

### **2.1.2 Lewin's Change Model (1946)**

As outlined by Kavanagh and Thite (2009), one of the earliest and key contributions to organizational change is Kurt Lewin's three step change Model. Lewin's three step model is very much a significant part of change management strategies for managing change in the workplace in the 21st century.

The framework serves as a general model for understanding planned change. It has been used to explain how change of an information systems can be implemented more effectively (Benjamin & Levinson 1993).

Change is often described as a process that goes through a series of different phases that require a considerable length of time. Lewin's (1946) model presents this as a three phase change process, namely unfreezing, changing/moving and freezing. Developed in 1940's, the concept of 'Unfreezing-Changing-Refreezing' still remains relevant and useful today, and has been successfully used in several empirical studies such as implementing planned change (Kavanagh & Thite, 2009) among others. In the model (figure 2.2), represents the three stages of introducing and implementing change.



**Figure 2.2: Lewin's Three Step Change Model (1946)**

*Source: Kavanagh & Thite (2009 pg 178)*

### **Unfreezing**

This involves reducing or curtailing forces which maintain behavior in its present form and recognizing the need for change for improvement and growth. A sense of urgency is created at this stage to prepare people for change. Unfreezing is a pre-stage of change. It aims at preparing individuals to change and make an organization ready to move from the current position to the new desired one.

During the unfreezing stage individuals may feel their status quo threatened. Consequently, it is crucial to make people understand, from the start, the organization's necessity and urgency for change. Sometimes, the need for change appears pretty obvious, for instance, in cases of declining library usage, abnormal circulation statistics or unprecedented high number of patrons complains. It is not always that way, however, and it is always helpful creating a trigger or situation for change.

In general, this model focuses on developing a persuasive and compelling communication process that would sell the change idea. Therefore, it is crucial to determine and provide evidence of the reasons and factors accounting for change, within an aim of winning an all inclusive approval and also ensuring everyone contributes to the change process.

The unfreezing stage requires that employers accept change, communicate to staff the benefits linked to change and try to allay individual fears (Porter et al, 2006). During this phase, organizations only assess the need for change and the nature of change required.

Kurt Lewin's model suggests that one of the best ways to motivate people to change is to first get people to see the need for change. Naturally, people need to intuitively see the need for change, for the catalyst to occur, to provoke them to "unfreeze".

From a library ICT system perspective, the library management, staff and users need to see the importance of changing to a new system. The managing librarians should unfreeze to avoid change resistance from within, highlight the gaps between the current and desired state as well as prove that the existing ICT system needs to be dropped before a new way of operating can be adopted.

### **Change or Transition**

The next step after unfreezing is to change/move the people towards the new system. Change, according to the theory, is not an event but a process. It is also known as transition. It is an inner movement in a bid to change and occurs when the changes needed are made. The people become unfrozen and start moving towards the new change that has to be implemented. It is often considered as the most difficult and critical stage, as doubts still linger in people. They have not fully accepted the implications of change and need time to chew over it.

Kavanagh and Thite (2009) has it that, where unfreezing creates the motivation to change, the changing or transition stage focuses on helping the behavior of an organization / members to the new state of affairs. As outlined in Kavanagh & Thite (2009), Bridges (2003) defines this stage as psychological—a three phase process that people go through as they internalize and come to terms with the details of the new situation that change brought. This transition phase consists of three key elements: ending, neutral zone and new beginnings. Cameron & Green (2004) argue that before you bring something new, you have to end what used to be. That way, one needs to identify who is losing what, expect a reaction, and acknowledge the losses openly.

The step between the old and the new way of doing things is the neutral zone where people need to make the psychological adjustments necessary. This helps in mental preparation for the new system. In the neutral zone, people feel disoriented, motivation falls, and anxiety rises. Also, consensus may break down as attitudes become polarized.

A new beginning is the final step in the transition phase. It is about coming out of the transition and making a new beginning. This is when people develop a new identity, experience, revitalizes their energy, and discovers purpose in the organization thus facilitating working of the change.

Bridges (2003) has it that if change agents do not help people through these three steps (ending, neutral zone and new beginning) in the transition process, even excellent training programs might not rescue the change process.

**Refreezing**

Kurt Lewin's last stage is freezing and it deals with achieving stability after the implementation of changes. According to Burnes (2004) it seeks to stabilize the organization and ensure that the new behaviors are safe from regression. Here, the changes are accepted and become the new norm. People form new relationships and become comfortable with their routines.

In summary Kurt Lewin model was developed to summarize what he believed were the basic steps in effective and well planned change. The model demonstrates that to move an organization from point A to point B first we should create compelling and motivating reasons to change (unfreeze), then implement and install the necessary changes (transition) to the tune of desired output.

This should be followed by the operation to freeze to a higher level of performance. If this model is not followed, however, then changes will be short-lived. In other words, you can cause needed change to occur, by observing the necessary measures. However, in order for change to be permanent, you must dismantle the present (and the capability to move back to the present), move from the present to the future and put in place the people and processes to ensure permanency. Although Lewin Model was ideally for planned change, it is applicable when unplanned but anticipated change occurs, it can also be used for planned change.



Irrespectively, the model has its merits and demerits. According to Syque (2007) benefits include: Its simplicity and ease of understanding; use of systematic steps and applicability even in the current age. However, at the refreezing period, many people are worried that another change is coming, so they are in change shock. This change shock causes employees to not be as efficient or effective in their jobs and it's detrimental to productivity. The biggest weakness of Lewin's model is assuming that organizations stay in an equilibrium state (Cummings and Worley 2009).

### **2.1.3 Kotter's Process of Leading Change (1996)**

Kotter's (1996) eight stages model was developed after studying more than 100 organizations undergoing change. The model offers a process to successfully manage change and avoid common pitfalls that beset failed change programs.

As explained by Kavanagh & Thite (2009), change process goes through a series of phases, each lasting a considerable period of time. Critical mistakes in any of the phases can have a devastating impact on the momentum of the change process.

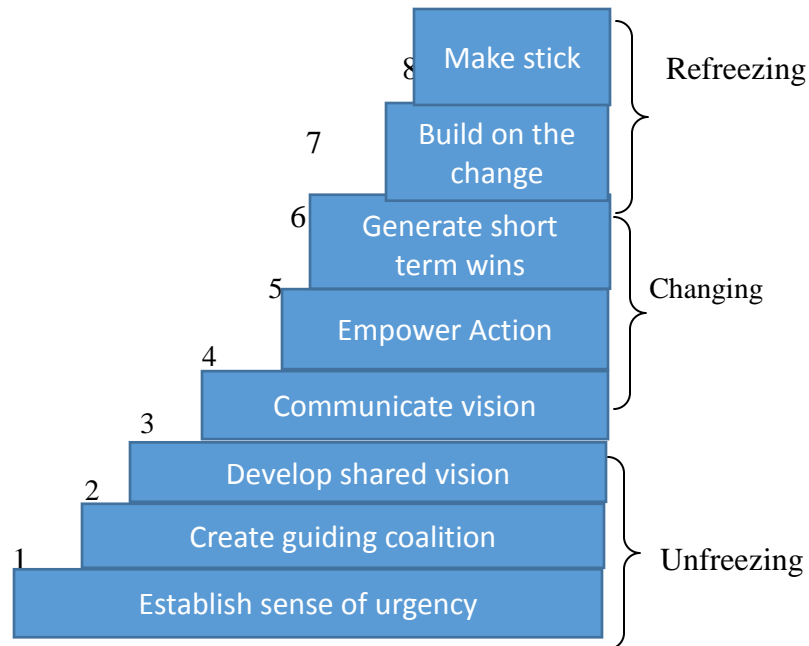
Kotter's first four stages focus on the practices associated with "unfreezing" the organization which involves getting people to examine seriously the competitive realities; identifying potential crises or major opportunities; putting together a group with enough power to lead the change and getting the group to work together like a team; creating a vision to help direct the change effort; developing strategies for achieving that vision and

using every means to constantly communicate the new vision, strategies and modeling needed to modify organizational behavior.

The next three stages introduce many new practices (change/transition). These practices entail,

- Empowering a broad base of people to take action—getting blockers and changing the systems/ structures that seriously undermine the change vision and encouraging risk taking and non-traditional ideas, activities and actions
- Generating short-term wins by planning for tangible performance improvements, recognizing and rewarding people who made the wins
- Consolidating gains and changing all systems, structures and policies that do not fit together and do not fit the transformation vision
- Hiring, promoting and developing people who can implement the change vision and reinvigorating the process with new projects, themes, and change agents.

The last stage is required to ground the changes in the corporate culture (refreezing) and make them stick. Kotter's model requires that, all stages must be worked through for the change to be a success. Skipping even a single step or getting too far ahead without a solid base creates problems (Kotter, 1996).



**Figure 2.3: Kotter's Eight-Stage Change Process**

*Source: Kavanagh & Thite (2009 pg 184)*

Kotter Model (figure 2.3), fully prepares the employees of a company before the vision is even created, which means that the actual transition will be much easier in the long run. One advantage of this model is that it is a step by step model, which is easy to follow.

Another is that it does not focus on the change itself, but rather the acceptance and preparedness for this change, which makes transition easier. Its main disadvantage is that it creates a symbiotic relation between the stages that can be fatal if broken.

According to Kotter (1996), these eight steps lead to highly successful change efforts, as the “core of the matter is always about changing the behavior of people, and behavioral

change happens in highly successful situations mostly by speaking to people's feelings". To achieve this outcome, Kotter (1996) emphasizes the application of human relations skills. These skills—which in essence are political behaviours (the means by which leaders leverage their bases of power to achieve desirable outcomes through their interactions with others)—stem from the power-influence leadership school of thought.

## **2.2 Conceptualization Framework**

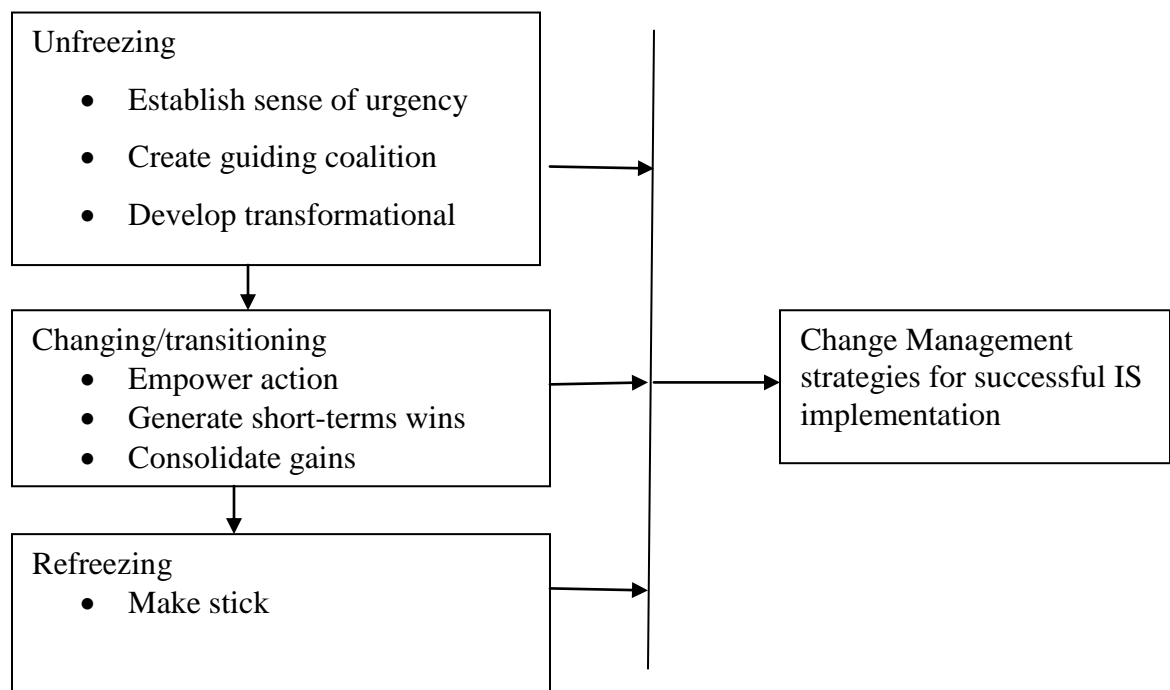
The conceptual framework for the proposed study is based on the above theoretical framework. Emphasis is on change management in the implementation of automated Information Systems for benefits as envisaged by the models.

In the context of this study, the conceptual framework shows how the elements under study are interrelated and their expected contributions towards effective and efficient change management in the implementation of automated Information System at CUEA library.

To some extent, Lewin's and Kotter's models map into Nolan and Norton S-curve model. The initial dip may be the inevitable cost of unfreezing. The climb, on the other hand, is where the real moving happens. If refreezing does not take place the climb is held back. As such, Kotter's eight step model clearly has relations to Lewin's model for planned change. This is since Kotter's first four steps can relate to Lewin's first phase. Also, Lewin's next phase can be found in Kotter's step five to seven, whereas the last eight steps in Kotter's model covers the last phase in Lewin's model.

Lewin's (1946) and Kotter (1996) models identified elements that aid in assuring a successful change management effort. When the models are combined, for the purpose of comparison, what emerges is a series of common themes that have a major impact on the successful outcome of any change initiative. The models share some general steps that lead to successful change management.

These steps are conceptualized as:



**Figure 2.4: Conceptual Framework of Change Management**

*Source: Author (2012)*

The change models and theories presented share similar characteristics and are noted in various steps of the models. Additionally, all the models identified a process where the organization has to establish a reason and need for change. This step has to start with the leaders of the library. Thus, as in the above conceptual framework (figure 2.4), it can be

deduced that successful implementation of ISs at CUEA university library depends largely on effective and efficient application of change management strategies.

First, CUEA library management must focus on unfreezing. This can be done by getting its staff and users examine the need for change. Motivation of staff towards change is also a key strategy in getting people see the need for change.

In a library ICT system point of view, the library management, staff and users need to see the sense in changing to a new system. The library leaders should highlight the gaps between the current and desired state and prove that the existing ICT system needs to be broken down before a new way of operating can be adopted. After unfreezing, then people are ready to change where the change will be permanent.

In the following sections thematic review of documented literature is presented based on the study objectives and the examined theories.

### **2.3 Application of Automated Systems in Libraries**

As aptly pointed out by Emmanuel & Sife (2008), Information and Communication Technologies (ICTs) have increasingly become indispensable tools for development over the past few decades. The positive effects of ICTs have continually been noted.

In libraries, according to Ogunsola (2004) several systems have been developed for their various house-keeping chores and more still are being designed and refined. These are

known as microcomputers, designed to handle any of the library processes, for example acquisition, cataloguing, serials control, circulation control, bibliographic control, or Selective Dissemination of Information (SDI).

Information Technology (IT) Madu, (2002), is applied to the operation of libraries and information centres to ensure that information delivered is timely, accurate, precise and relevant. In the traditional manual library system, Madu (2002), though staff perform the various tasks required to complete each operation, a computer will be more efficient if used in service provision. He defines library automation as “the use of computers and associated technology in library services provision in order to reduced cost and increase efficient performance.

Generally, IT applies to library services in a number of ways, including acquisitions, cataloguing, circulation, serials and user services. While agreeing, Islam (2006) asserts that computers in libraries have been used to mainly automate the functions such as Cataloguing and short loans; acquisition and budgets; circulation; serials control (periodicals) and access to online catalogues. Ogunsola (2004) observed that with IT systems, University libraries can be transformed into new information technology based service units which will be efficient in providing electronic cataloguing, OPAC, electronics acquisition/serials control, electronic inter-library loaning and other administrative functions

The impacts of new technologies are experienced by libraries in every aspect. They affect how information is handled and disseminated in information centers. Also, ICT's have

tremendously changed the management of resources/ housekeeping operations as well as the way services are delivered in libraries. Krubu and Osawaru (2011) agree, asserting that while general IT application tools and Integrated Library Management Systems are largely used in housekeeping operations—acquisition, cataloguing, circulation control and serials control—Internet has been used extensively as a resource as well as a tool for delivery of information services.

Consequently, access to computers and the internet has become an unavoidable necessity for every institution of higher learning and research. Wawire and Messah (2010) argue that Information and Communication Technologies (ICT) have become ubiquitous in the current and future social and organizational development. According to them, the role of these technologies in national development is undeniably significant. This has prompted developing countries to adopt and be more receptive to new technologies.

The advent of ICT on the global scene has brought about a revolution in libraries and all service providing industries. Indeed, ICT has changed the ways and patterns in which information and other services are dispensed. Nwachukwu (2005) affirms this by observing that with all the changes in information delivery, processes of access, storage, transmission and reproduction, and librarians and libraries must adapt to new roles and skills to cope with change.

According to Chisenga (2004), accelerated adoption and use of Information and Communication Technology (ICT) has resulted into globalization of information and knowledge resources. Bibliographic databases, full-text documents, and digital library



collections are always available to users. In agreement, Ali (2004) writes that libraries now integrate multiple information technologies in all areas such as library housekeeping and routine work. The routine work includes acquisition, cataloguing, classification, serials control, circulation, reference services, stock verification, safety and security. The author observes that library ICT systems can be applied for administrative and general work; including human resource management and development, database creation for employees, notification of library rules and service rules, maintaining records pertaining to leave, discipline, attendance, management of personnel files and also work related to library committees.

In higher education, ICTs have great influence in teaching, learning, research and other scholarly and professional activities. ICTs have greatly simplified acquisition, information resources organization, storage, retrieval, provision and usage of information. Internet and CD-ROMs, for instance, have greatly enhanced access to a range of information resources.

In summary, ICTs have improved provision of library and information services. They have done this by overcoming time, distance and other barriers. Nwalo (2009), observes that use of ICTs in information centers builds a strong and effective information system. For years, according to them, libraries previously used manual systems to gather, process, and disseminate information to users. The advent of ICTs, however, has changed this practice and made library and information services, as well as information access, much faster and easier.

Noting the rapid advancement of technology in organizations, (Galliers and Leidner (2006) observe how different levels of the management hierarchy are now using ICT's. The aim, now, is not only to improve efficiency but also to improve business effectiveness and manage organizations more strategically. They further argue that organizations may regard IT (Information Technology) as a 'necessary evil'—something that is needed in order to stay in business—while others may see it as a major source of strategic opportunity for seeking proactively to identify how IT-based information systems can help them gain a competitive edge.

Once an organization embarks on an investment of this kind, regardless of the stance taken, there is little opportunity for turning back. However, the rapid change in IT causes more uncertainty, in an already uncertain business environment, to be highly unpredictable.

#### **2.4 Factors Necessitating Need for Automated Library System Change**

As captured in the following statement migration to a new automated system is a fact of life in the world of library automation

*“Sooner or later many libraries will conclude that, for a variety of reasons, their present system is inadequate. They may require additional functionality, or the current vendor may no longer be viable in terms of products or service. In some cases the library may simply have outgrown the present system. In others, ongoing costs may have become prohibitive. New and emerging technologies often provide the impetus for migration, making possible faster access, lower cost, and enhanced services”. (Hallmark and Garcia, 1992:pp 166)*

Since libraries began automating various aspects of processing in the late 1960's, they have struggled with the transition from one system to another. As hardware and software of the first generation systems became dated and electronic information resources became increasingly available in the mid 1980's, libraries began to recognize the need to start planning for the replacement of their present integrated library systems.

Users also demand for more locally mounted information files and more sophisticated searching techniques. This reinforces the need to change systems (Pattie & Lach 1992). A number of authors have examined factors that have influenced rapid change in library automation (Pattie & Lach 1992; Stump & Torgerson 2008; Tebbetts 2000).

These factors include:

### **1. New Technological Developments**

A major factor in the high rate of change in library automation is the fast-paced development in the field of computerization. Library automation vendors have to keep up with the plethora of new developments in hardware and software design. In addition, they have to provide the modules needed in the library workflow.

Sadly though, some vendors do not offer complete systems and they have to upgrade their systems to include the needed subsystems. These vendors, for instances, do not have serials control subsystems or acquisitions subsystems; and the libraries have to add modules from other systems, wait for their vendors to develop the needed modules, or buy completely new systems (Torgerson 2008; Tebbetts 2000).

Library automation is a continually evolving process and libraries have to make changes so as to provide the necessary services. The libraries thus require new and more powerful hardware in order to add software that implement new modules, adopt either upgraded systems or entirely new systems

## **2. Expansion of Databases**

Libraries are not only providing access to their online catalogs but they are also adding other databases to their online systems. These include periodical indexes, full-text databases, and locally-produced databases. These databases, every so often, require expanded hardware facilities and new or upgraded software. This means that the library has to change or expand systems to support the needed capabilities and capacity.

Needs in library automation change occur so rapidly, that it is essential for the library and its system to have flexibility for accommodating new demands.

## **3. Vendor instability**

Perhaps, the single and most-important factor contributing to the quick pace of change in library automation is the instability among library automation vendors. This vendor volatility combined with the fast-paced nature of library automation creates a difficult situation for library managers.

To keep up with increased demands and a changing environment, libraries need a system that is capable of being upgraded to meet current and emerging needs. When the system

is no longer viable or functioning effectively, it becomes mandatory that the Library migrate to a new system.

In a research carried out by Tebbets (2000) on automation in New England libraries, it was noted that four out of five vendors engaged by the libraries in 1985 had since either gone out of business or were unstable. As Tebbets puts it,

*...”this has necessitated changes for the libraries involved. One library is in the process of getting a new system, another is continuing with the old system but cannot add any new modules and it also is looking at a new system. Two libraries, additionally, have added sub-systems from another vendor, and one library with an incomplete system is looking at a distributed interfaced system with CD-ROM based networked catalogs”. (Tebbetts, 2000: pp 3)*

Due to vendor instability, these libraries had not fully implemented the integrated systems as originally planned. They had been forced to go to new systems or to add subsystems from other vendors, and only the library with the stable vendor had been able to fully integrate all the major library functions and proceed to further implementation and expansion of the system.

The findings further showed that vendor instability had been a major factor in delaying the development of library automation in several of the libraries. Consequently, they were necessitated to switch to new or hybrid systems.

Clark and Morris (1998) noted, in a survey of 154 libraries carried out by Pourclau (1992) that 87 libraries had migrated from one system to another. Obsolete hardware, lack of functionality, unresolved system problems, long response times, lack of confidence in current vendor, abandonment of system by vendor and user complaints were found to be the most prominent reasons common for system migration /change .

Clark and Morris (1998), further state that the pace of technological developments and changes in user requirements, reduces the five- or seven year system life cycle. Although the reasons for system migration and change revolve around technological considerations, the impact falls on people thereby emphasizing the importance of change management in system implementation.

## **2.5 Approaches Used In Automated System Implementation**

In his book, Davies (2009) presented information system implementation stages which are concerned with a number of key activities in the process. This information system implementation process concept is similar to O'Brien (2004) five-step process called the Information Systems Development Cycle. The process includes:

- 1) Investigation
- 2) Analysis
- 3) Design
- 4) Implementation and
- 5) Maintenance.

The first phase of information system development process is systems investigation or system conception. It aims at determining how to develop a project management plan and obtain management approval based on informatics planning and management.

Systems analysis is focused on identifying the information needs and developing the functional requirements of a system. Systems design is the process of planning a technical artifact and developing specifications for hardware, software, data, people, and

network. In addition, this phase involves building the information system to its specifications.

System implementation involves delivery of systems, testing the system, training people to use the system, and converting all aspects of the business to the new system. Finally, and according to (O'Brien 2004; Davies 2009), system maintenance is the process of making necessary changes to the functionality of an information system.

### **2.5.1 System Investigation/Analysis**

According to Kavanagh & Thite (2009) this is the second stage in SDLC. The purpose of this step is to identify potential problems and while considering them in light of goals of the library.

This stage entails:

#### **a) Feasibility Analysis/study of the System**

The aim of feasibility study is to determine if the target is achievable, provide a cost benefit analysis and examine alternative solutions thereby answering the following questions:

1. Is the proposed system realistic?
2. Is it necessary?
3. What other options are available?
4. Is it affordable?

Feasibility study is concerned with assessing technical, economic, legal operational and system schedule. Technical feasibility checks whether the hardware, software and other system components can be acquired or developed to solve the problem, while on the

other hand economic feasibility determines whether the project makes financial sense and whether predicted benefits offset the cost and time needed to obtain them.

Additionally, legal feasibility determines whether laws and regulations can prevent or limit systems development project. This entails analysis and investigation of existing and future laws. Operational feasibility is a measure of whether the project can be put into action or operation and It may include logistical and motivational (acceptance of change) considerations. Motivational considerations are important as new systems affect people and data flows and can have unintended consequences.

Schedule feasibility determines whether the project can be completed in a reasonable amount of time. This involves balancing the time and resources requirements of the project. The final output of the feasibility study is a report to be presented to the management (Stair, Reynolds & Chesney, 2008), and it is of utmost importance to understand the current needs of the library before undertaking the work of automation in order to understand the role that various organs can play in their new setting (Ali 2004).

Facts about the existing system could be gathered through multiple approaches including interviewing, observation, questionnaires, records and documentation inspections. Even though it is involving, it helps in discovering more about all the weaknesses and strengths of the existing system.



### **2.5.2 System Design**

This is the third stage in SDLC as opined by Kavanagh & Thite (2009). This commences once the system analyst has produced the statement of requirements and it is approved by the users that there is no pending question, idea or issue. The design stages entail output, file, input process and control aspects design. After design the system is reviewed as per specifications.

### **2.5.3 System Implementation**

Implementation involves a number of tasks which lead to the system being installed and ready to operate (Stair, Reynolds & Chesney 2008). It is the stage at which the system is built, tested and readied for actual rollout or “go live” (Kavanagh & Thite 2009). These authors cite the following as core activities undertaken at this stage: hardware and software acquisition; system development (programming); user preparation/training (readying users for the new system); documentation preparation; hiring and training personnel (IS personnel); site preparation; data conversion, installation; testing; start-up; and user motivation and acceptance.

Similarly, Kavanagh & Thite (2009) point out two possible ways that the system can be put to use. One is to do an immediate change, where the old software is turned off and the new software turned on. Issues arising from the new software are reported and adjustments made. The authors, however, warn that this change regardless of training and the change management process, may throw users into confusion. The second option is parallel change. This is turning the new software on for some period before the old

software is turned off. During this time both software's are functioning, receiving input, running reports, being queried.

The authors point out the positive side of a parallel change as there is enormous testing that goes on before the old software is abandoned. However, they argue that parallel change may make users hang on to the old software because it is comfortable. They conclude that regardless of which change over method is chosen, it is absolutely critical that appropriate training and software support be in place.

In order to achieve implementation goals and objectives, Gunasekaran and Ngai (2004) assert that a strong project team is a prerequisite. This should constitute IT knowledge managers from all functional areas and top management support. They also emphasize on education, training and motivation of users, and enabling a transparent and open communication.

This is echoed by Morgan (2001) who states that a successful library automation project depends on good management. Consequently, library management requires attention to a wide variety of strategies/ techniques in embracing change caused by library automation. He goes further to provide three important strategies for managing human resources during automation change management:

**a) Establishing a Shared Motivating Vision**

An organization needs a clear vision of what it wants to accomplish in terms of a new library automation system. The vision should be established so that the role of library automation will result in a more effective and efficient library service. To achieve this, library manager must communicate the vision and develop a shared need for change and mobilize people.

**b) Creating Open Communication**

Automation change should be communicated in a way that staff will see it as a positive thing, for both the library and themselves. Organizational change, according to Slocum and Hellriegel (2007), can succeed only if the manager understands the resistance that will be encountered from individuals and the organization. As such, communication of information is important. This is in order to create a climate of trust and openness that minimize uncertainty and reduces resistance.

Ritson and Marsden (2001) state that, if the employees are informed about the need for change they are likely to help with its implementation. Morgan (2001) assert that one way to help library staff deal with continuous change is for them to become more involved in strategic issues and be strategically aware.

**c) Participative Management**

Participation reduces uncertainty and leads to commitment, sense of direction as well as loyalty. It has been identified that the people who participate in making decisions tends to

be more committed to the change process than those who are not involved in decision making. Also, taking their views into account may enhance effectiveness of the change programme. Employees, who are involved in the change process, are in a better position to understand the need for change and are motivated to support change. Therefore they are less likely to resist it.

Ritson and Marsden (2001) states that library automation will better succeed where participative management is practiced. Change management in information technology (IT) projects should address the same concerns as other corporate change efforts such as cultural transformations. Ignoring the wide-reaching impact IT initiatives have in the library and other workplaces will result in the continued failure of IT systems to deliver value over time.

When studying the existing literature on change, change management, ICT projects and organizational changes, it can be seen that change has similar effects on people, no matter what its cause. And as stated by Burnes (2008) employees will always resist change if they feel that it threatens their job.

Milis & Mercken (2002) explain that to reduce resistance, the future users of a new system must be involved in the project in the early phases of a project. By doing this, a sense of ownership towards the project is created among the users and the people become more committed to the project. A feeling of a common, “our project”, is created. The authors also describe that by effective communication, the users form realistic

expectations for the project and uncertainty is reduced. In addition, Communication encourages teamwork.

However, Milis & Mercken (2002) state that communication must be focused rather than broad-brush and that timing is very important. Milis & Mercken (2002) further explains that support is very important and that the project team must be focused, committed and motivated to support the user's complaints. They emphasized the role of leadership in reducing resistance, since people management is an important part of a project and therefore also an important skill for the project manager. In addition to this, top management support is important.

Although it is commonly assumed that once people are convinced that change is necessary, and that the change vision is the right one, they would be ready to move forward with implementation. Harvard Business Essentials (2003) warns that, implementation rarely proceeds smoothly. As people get into the nitty-gritty of implementing their change initiative, they discover that there is no tidy, step-by-step march to the envisioned future. Harvard Business Essentials (2003) attributes this to mistakes made, external factors that may upset schedules and key people quitting or transferring to different groups forgetting to communicate to each other.

In support, Gotsill & Meryl (2007) suggest three critical steps that should be followed when implementing change in the workplace. The steps are: focus on people,

communicate strategic messages and combine communication and training. The steps are explained below.

**d) Focus on People/Employee-user Involvement and Preparedness**

Whenever implementing change, the human element must be acknowledged and that resistance is inevitable (Gotsill & Meryl 2007), since people are more likely to accept the forthcoming change if they know what to expect in each phase of the project, employees need to be a part of the process and heard. Involvement in the change process gives people the chance to raise and resolve their concerns. They also make suggestions about the form of the change and how it should be introduced. This facilitates owning up of the project by the people (Armstrong 2009).

According to Yeats and Wakefield (2004), IT professionals and managers in organizations seeking to benefit from investments in technology often overlook a critical success factor: the people who actually use IT systems. Without adequate considerations of their needs, the authors write, the system to be introduced is likely to fail no matter how well-designed it is. It is thus advisable that, IT professionals and managers have clear information of the people to use the system, how motivated the people are, what they know about the system they are getting, the aspects of change to a new system they are likely to resist, or embrace and the skills and guidance they may need so as to get maximum benefit out of the new system.

They suggest that the best way to ensure that the above issues are addressed is to develop a people based project in parallel with the technical IT project. The people project is to use change management theory as its framework with the aim of making the impact of new IT system on an organization as positive as possible.

This is done by ensuring that users and managers understand the objectives behind changing to a new system, and are committed to achieving them through realistic expectations of what life with the new system will be like, know what is required of them prior, during and after implementation and get the right level of support throughout the change.

Echoing the need to involve people to be affected by change, Cook (2004) suggests that the leader should spell out how he/she sees the change affecting individuals and employees as a whole. He further suggests that people should be made responsible by accounting for some aspects of the change to each person. More feedback should be provided than usual to ensure that people always know where they stand. People, he adds, take time to adapt to new ways and initial decline in performance is inevitable. Thus, people who are resistant to change should not be punished but rather given time to adapt.

The change leader should give people a chance to step back and look at what is going on. He/she should get feedback on what is working well and what could be better by encouraging people to think and act creatively and by listening and acting on employee and user suggestions. Cook (2004) asserts it is good to assess an organizations readiness

for change and this can be done through user involvement, and research of what happened during the last change. This is finding out if people are ready to change and what could be done to make them more ready.

Change starts with a new beginning, which may increase the satisfactions as desired. It can also pile up disturbances if it failed, as change initiatives are two pronged; either success or fail. Madsen (2003) refers to employee readiness for change as employees mental and physical preparedness for immediate action that aim to improve, alter, vary, or modify something.

Preparing an organization's employees for change is the most critical phase of strategic change management (Pasanen 2009). It includes communicating the forthcoming change to the organization and listening to the workforce and their concerns. Paying attention to the people demonstrates respect that can be a powerful tool later on in the project. It is also important to be equally fair with everyone during the process and be as transparent as possible.

Susanto (2008) warn that although planned change is intended to make the organization more effective and efficient, resistance from members of the organization are expected. Therefore, readiness for change from the members of the organization is a critical factor in successful change implementation. Thus user preparedness is vital for the change to be accepted and achieve success.



Kotter's (1996) classic model, for example, consists of unfreezing, movement, and refreezing. As per the model, unfreezing entails assessment of the current state and readying individuals and organizations for change. Movement, on the other hand, occurs when individuals engage in the change process while refreezing anchors new ways and behaviors into the daily routine and culture of the firm. Leading change requires the use of a diverse set of communication techniques to deliver appropriate messages, solicit feedback, create readiness for change along with a sense of urgency, and motivate recipients to act.

**e) Communication of Strategic Messages**

According to Gotsill & Meryl (2007), communicating strategic messages is the second critical step to be followed in implementation of change at the workplace. When people understand the reason or reasons behind the change, they are more willing to co-operate. However, this is not a one-time task as pointed by Kotter (1996) change model but rather a process that needs careful planning, motivation, and professional execution. Once the employees have an understanding of the project and reasons behind it, continuous communication is needed to reinforce the mindset.

Kotter (1996) emphasizes the fact that communication throughout the project is essential for its success. It is the highest priority and the first strategy for every organizational change. As Williams & Williams (2007) describe it, people respond to change more positively when they have an understanding of its purpose and consequences.

Cook (2004) suggests that before any change, whenever possible, people should be informed of what is happening in good time but not so far ahead that they forget about the change or become unduly concerned. Armstrong (2009), in agreement with Cook, affirms that effective change management is about communicating management's intentions to people and making sure that they understand how they will be affected. Communication about the proposed change, He adds, should be prepared and transmitted so that unnecessary fears are allayed. Effective change communication can make the difference between success and failure of an ICT implementation project. Employee communication is especially critical when we are "trying to get others see and do things differently" (Kavanagh and Thite, 2009).

Armenakis and Hariss (2002) suggest that change leaders who ever so often overlook the importance of consistently communicating change message and vision fuel contributes to breeding of resistance against change. Duck (2001) reminds us that it is the communication process that starts to unfreeze and predispose people to change. Yeats and Wakefield (2004) assert that the foundation for a sound people project is effective communication.

A good communication plan is therefore an important part of any change management program, as communicating means influencing people as much as informing them. It is also helping shape their attitudes, building their commitment and gaining their cooperation.

## **f) Training**

The last step of change management at workplace is training (Gotsill & Meryl, 2007). It helps people understand what the project and its outcome mean and how it will affect their work in the future. While communication answers the “why” –question, training provides and answer to the “how” –question.

Bentley and Whitten (2007), point out that change may be good, but it is not always easy. Converting to a new system necessitates that system users be trained and provided with user manuals for guidance. Though training can be done from individual to individual, Bentley and Whitten (2007), suggest that group training is generally preferred. This is due to its time and resource consciousness, while also fostering team work in learning.

Users must be trained on the how to use the new system until they are comfortable with it. Ongoing effective training is essential in any change management initiative, particularly when new technology and work processes are involved (Kavanagh and Thite, 2009). Typically, successful companies offer training in the early stages of the project. This is in order to reduce uncertainty about the new technology by providing information about its characteristics thus generate user acceptance (Ruta 2005).

Kavanagh and Thite (2009) suggest that while some training early in the process is recommended, full training should not be offered until just before the system will be used. The reasoning behind this is if training is provided too early, users will not retain the material. Additionally, advanced training should be provided in phases, as users

become accustomed to performing routine tasks. The authors argue that if training is not provided, employees will be less likely to use and accept the system. Training should also be provided in new employee orientation programs.

According to O'Brien and Marakas (2010) system implementation can be a difficult and time-consuming process. It is however vital to ensure the success of any newly developed system, for even a well designed system will fail if it is not properly implemented. This necessitates training in the implementation stage. O'Brien and Marakas (2010) further suggest that IS personnel, e.g. consultants, must ensure that end users are trained to operate a new business system, or its implementation will fail. Here, training may involve activities like data entry and/or all user based aspects of the new system. In addition, managers and users must be educated on how the new technology affects the company's business operations and management.

On change delivery, Cook (2004) states that the change leader should train and coach others, provide appropriate training environment for new skills necessary and develop new attitudes and behavior patterns. Training is an appropriate means of enabling staff to cope effectively with technological change. Since staff have different needs, it is best to offer a range of training methods (Spacey et al., 2003)

## **2.6 Perceptions, Attitudes and Responses towards Change**

Thornhill et al. (2007) consider a number of perceptions about the management of change that affect reactions to it. These include whether change is perceived as 'deviant or normal' and 'threatening or desirable'.

Change judged as deviant will be perceived as imposed and outside prevailing norms and it is likely to generate resistance at various levels. Change seen as threatening is also likely to meet resistance and this will require careful implementation so as to overcome the fear associated with this perception. Perceptions about the nature of change and the need for it will therefore affect reactions to it.

People react to change in different ways. Skrllec & Vlahovic (2010 ) grouped these reactions in different categories as:

*Positive attitudes:* Positive attitudes of employees are the ideal situation every management looks for as well as each member of a designated team for the implementation of a change project. That is a situation when the whole business gets together with its employees in desire and purpose so that a change implementation project can be realized in a faster and better manner. Such a situation does not occur randomly and it is mainly the responsibility of the management of the business. When a relationship is positive, it means that the management has done its job properly, as expected. It has clearly explained its objective and the effects such a project brings about, whether positive or presently negative.

*Negative attitudes:* Unlike positive attitudes, negative attitudes towards a change implementation project are undesirable by management. If such a situation occurs, the management is responsible because it has not presented properly and in a clear and transparent way the effects of the project. Employees are *a priori* against a change

implementation project and do not wish to participate in it because they consider that it will not bring anything good and that it simply is not necessary. This attitude cannot be neglected as it can lead to even greater problems such as revolt or absenteeism. These phenomena suggest that the problem is in something else and not specifically in the project, and for which management takes responsibility (Skrlec & Vlahovic, 2010).

*Neutral attitudes:* Neutral attitude is a situation in which employees do not care how and why is the change project going to be implemented. There is a very small ratio of such employees (Skrlec & Vlahovic, 2010)

*Uncertain attitudes:* The most frequent type of employee attitude is actually the feeling of uncertainty. The feeling of uncertainty may be present because of the following reasons: insufficient information, loss of job, and other reasons. Reasons for such feeling stem from the fact that employees do not know what the project and the changes would bring to them as individuals or as a group. There is a fear present that they will not be able to respond to the new requirements that will be presented to them as individuals or to the whole group. Therefore, the main reason is the insufficient information. The second and equally important is the fear of job loss or the fear that personal income will decrease (Skrlec & Vlahovic, 2010)

### **2.6.1 Library Staff and Users Attitudes to Change Management**

According to Adekunle et al. (2007), Babu et al. (2007), Uwaifo (2007) and Dhanavandan et al. (2008) library professionals in various countries have a positive

attitude towards the use of ICT, although they need extensive and appropriate training to make efficient use of ICT tools and techniques.

Bot (2008) notes that, ICT in University Libraries has become the driving force in the new service platform of the library. This involves the application of computer and other communication technologies so as to provide what was previously provided in “hard” or “physical” copies. The adoption and adaptation of ICT by University libraries follows a global trend in the provision of effective information services to users. ICT has provided libraries with new opportunities to improve their resources and services. The advances in ICT has been rendering manual based library system in academic, research, special and public libraries less relevant.

Reddy (2001) assert that many people resist using computers and other ICT technology when new technologies are being introduced almost daily. However, it is essential for librarians to keep up with ICT developments. The use of ICTs in the library depends largely on the librarian’s attitude toward the current digital age. Willingness to adopt new technologies is critical to their successful implementation in libraries (Rabina and Walczyk 2007). Libraries' commitment to ICTs has traditionally been led by two complementary beliefs. They include; once new technologies are adopted, services to patrons will be improved and secondly, after implementation is completed and the potential of new ICTs has been achieved, the anticipated fiscal benefits and those associated with efficiency and productivity will begin to be realized. Frequently missing from this belief system, is a consideration of the effect the employees' willingness to

adopt new innovations might have on successful diffusion and the realization of these two beliefs.

Implementing automated systems (IT) in the library depends largely on librarians' attitudes toward it. Ramzan (2004) observed that, technological change is posing a particular challenge to librarians in developing countries. According to this author, librarians in developed countries moved quickly to learn and adopt new information technologies.

ICT was introduced to perform library functions and provide innovative user services. Librarians gained knowledge of new technologies through continuing education programs, professional training, and revisions to library school curricula, which helped them benefit from the new technologies. More to this, their libraries became equipped with appropriate hardware and software. However, the story in developing nations such as Kenya is quite different. He observed that, librarians in developing countries were not prepared to embrace the changes forced on them by new technologies. Most of them were uncertain about ICT applications in their libraries and benefits for their organizations, because they had little ICT knowledge. Much has changed since then as more librarians and other information professionals strive to be on the cutting edge of technology as the benefits of ICT use in their work environment have become obvious (Ramzan, 2004).

According to Spacey, et al. (2003), positive attitudes are fundamental in implementing new technologies. Widespread fear and negative attitudes have been shown to slow the progress of ICT implementation (Popoola 2002). Aswathappa (2005) notes that, with the



advent of technology, jobs become more intellectual or upgraded. A job hitherto handled by an illiterate or unskilled worker now requires the services of an educated and skilled worker. O'Brien, (2007) however, realizes that information technology has had beneficial results as well as detrimental effects on society and people in each of these areas. For instance, computerizing a library process may have the adverse effect of eliminating people's jobs, but also have the beneficial result of improving working conditions and producing services of higher quality at less cost. He, O'Brien (2007), states that information technology plays a major role in reengineering most business processes. The speed, information processing capabilities, and connectivity of computers and internet technologies can substantially increase the efficiency of library processes, as well as communications and collaboration among the people responsible for their operation.

Information technology makes it technically and economically feasible to collect, store, integrate, interchange, and retrieve data and information quickly and easily. This characteristic has an important beneficial effect on the efficiency and effectiveness of computer-based information systems (O'Brien, 2007). However, the power of information technology to store and retrieve information can have a negative effect on the right to privacy of every individual.

O'Brien (2007) further argues that the impact of information technologies on employment is a major ethical issue of concern and is directly related to the use of computers to achieve automation of library activities. As such, there can be no doubt that

use of information technologies has created new jobs and increased productivity, while also causing a significant reduction in some types of job opportunities.

Information technologies are used to create and keep track of documents in most libraries around the world. Therefore, librarians are not spared by this sway of events. A positive attitude towards the introduction of the new technologies by librarians is critical in ensuring successful implementation

## **2.7 Challenges Experienced in the Implementation of ICTs**

Implementation is an important managerial responsibility. Implementation is doing what you planned to do. It is a process that carries out the plans for changes in IT strategies and applications that were developed in the planning stage.

Emmanuel & Sife (2008) note that, while new technologies have added value to library services by presenting new modes of collecting, storing, retrieving and providing information; they have also brought new challenges and aggravated some of the challenges that faced libraries before. The challenges relate to acquisition of ICTs, preservation of electronic information resources, maintenance and security issues, training of users, general lack of awareness and commitment among library stakeholders.

The literature has provided a wide array of documented challenges in ICTs implementation. Common among the challenges identified include:

**a) Lack of user involvement in system implementation processes**

Legris & Colletette (2006) observed that, there are crises in the way IT projects in libraries are handled and managed. Yeats and Wakefield (2004) assert that, computer systems are not delivering the benefits for which they were designed and one important reason for this is that people have been overlooked. Yeats & Wakefield (2004) suggest keener study of human computer interaction when a new library information system is to be implemented. Kavanagh & Thite (2009) argue that failure in successful implementation of information systems has less to do with hardware or software aspects of the new system and more to do with the skills of the change leader, people affected and effecting the change as well as organizational issues related to this change. Legris & Colletette (2006) suggest that management and people are the biggest obstacles in a system.

**b) Shortage of change leader skills**

Kavanagh and Thite (2009) are of the view that, the failure to successfully implement information systems has less to do with hardware or software aspects of the new system. However, they can be accrued to the skills of the change leader, the people and organizational issues related to the change.

**c) Lack of executive support and commitment**

Kavanagh and Thite (2009) attribute lack of executive support as one of the main reasons why automated information systems implementations fail. Legris & Colletette (2006) are in agreement when they state that most ICT system failures are due to poor

implementation management. Without this support, organizations lack the funding, approvals, and leadership necessary to properly implement, integrate, and maintain the system. Kavanagh and Thite (2009) assert that project managers lacking in leadership skills have also contributed to project failure.

O'Brien (2007) notes that system implementation is not just software project, but also an organizational change project. The projects call for co-operation, teamwork, and planning for organizational change and are difficult to do when senior management is too busy to give the project adequate attention.

A research carried out by Emmanuel and Safi (2008) found out that, continuous commitment and involvement of key stakeholders is important when integrating ICTs in organizational functions. Low awareness on the importance of ICTs among the university top management has been great obstacle to ICT development. According to Tsubira & Mulira, (2004), real change and progress in ICT integration occur where there have been top-level commitment.

#### **d) Inadequate funding**

As stated by Nwalo (2000) and Mutula (2004), libraries require sufficient funds to acquire modern ICT facilities such as computers, servers, scanners, photocopiers, software as well as paying for online and offline services such as e-journals and digital libraries.

Most of these ICT facilities and services are very expensive and can be purchased from developed countries. On the contrary, experience reveals that most university libraries in

Africa and other developing countries get very little funds from their parent institutions and the government for support of their activities. As a result, implementation of ICT in university libraries and other information centers is bedeviled with series of problems such as funding, inadequate infrastructure and lack of training and education among others (Mutula, 2004).

Emmanuel & Sife (2008) are for the view that this situation is attributed to among other factors, the poor perception of library services by top leaders and other stakeholders in the parent institutions. In addition, the little funds received fall far below the standard costs of ICT facilities and services.

**e) Lack of preparedness/readiness for change**

Wawire and Messah (2010) assert that, one of the major challenges faced in automating and establishing digitalized library projects in African Libraries, has been the readiness of the university libraries in terms of skills and knowledge for implementation.

Rosenberg (2006) states that other challenges include low funding, poor IT infrastructure, poor internet connectivity, lack of commitment from staff and or/ management. Chacha (2005) while commenting on ICT training in higher educational institutions in Africa notes that there has been insufficient training and re-skilling of end users as well as technical staff that support the systems in Higher Education Institutions. This is coupled with the inability of many institutions to recruit and retain qualified information systems staff. Little has changed today since these observations were made.

**f) Lack of experience, inadequate ICT expertise and poor retention of expertise**

Another challenge to ICT implementation is lack of experience, Maguire (2002). A case study based on Mascot Truck Parts cited in Maguire (2002) revealed that they had problems implementing a new IS due to lack of enough experience with regards to the processes involved and incidentally the system was not setup properly. In any business the use of personnel with specialized skills enhances the ability of an organization to be successful in implementing large, complex, or difficult tasks. It also allows for both deeper and stronger skills and the contribution of differing perspectives. Technical people who can be highly effective in approaching tasks from different perspectives are rare, that is why sooner or later libraries will bring in ICT specialists ( Mutula 2004).

Frequent maintenance of ICT facilities is crucial to sustainability of any ICT services. It is imperative that there are qualified technical personnel for managing and maintaining ICT facilities and networks that the library system runs. However, many libraries have inadequate qualified ICT personnel. Most traditional librarians have low ICT skills and sometimes suffer technology phobia. Some libraries have managed to recruit and train their own ICT experts but failed to retain them. Consequently, many libraries depend on ICT experts from outside.

According to Mutula (2000), Information Technology (IT) is foreign to a number of institutions in Eastern and Southern Africa regions and those institutions that have a technology infrastructure in place suffer from an under-utilization of the technology owing to shortage of skills.

**g) Resistance to change**

Resistance to change poses a major challenge in ICT implementation. This is individual's refusal to see benefits of a new system because of what is known for (Burke et al, 2001). A study by Gupta (2000) revealed that the main hurdle faced by most companies was the resistance to change. He expanded on this by explaining that the resistance was due to employees being reluctant to learn new techniques or the IT department was reluctant to change due to its attachment to the products.

Maguire (2000) also notes that there are still too many examples of ISs projects that have failed due to increasing problems of rising costs and the misuse of IS rather than acceptance and use of the system. Even with significant effort to ensure that system implementation is successful, many systems encounter resistance from potential users and others within the organization.

With every major and minor change, resistance typically occurs. Why does resistance to change occur? The primary reason is that people fear change. They are not usually eager to forego the familiar, safe, routine ways of conducting their business in favor of unknown and possibly unsafe territory.

As humans, we tend to prefer routines and accumulate habits easily; however, fear of change may be attributed to more than a tendency toward regularity. Change represents the unknown. It could mean the possibility of failure, the relinquishing or diminishing of

one's span of control and authority, or the possibility of success creating further change. It might be that the planned change has little or no effect on the organization whatsoever.

Any one of these possibilities can cause doubt and thus fear, understandably causing resistance to the change efforts. Additionally, the transition between the present state and the changed state is difficult for both individuals and organizations.

On an individual level, people must be reminded that every transition or change effort begins with an *ending* –the end of the current state. The first step toward change is going through the process of ending. Endings must be accepted and managed before individuals can fully embrace the change. Even if the impending change is desired, a sense of loss will occur. Because our sense of self is defined by our roles, our responsibilities, and our context, change forces us to redefine ourselves and our world. This process is not easy. Kotter (1996) does an excellent job of discussing the process of individual change in his model. In describing the process of ending, Kotter, presents eight but summarized in three stages that individuals must pass through in order to move into the transition state and effectively change.

#### **h) Benign Neglect**

Burke et al, (2001) cites *benign neglect* as another challenge in ICT implementation. According to these authors, ignoring the situation and refusing to stay on track or fulfill responsibilities means there is a lack of focus on the project; which indicates that the organization is not very determined to make the Information Systems successful. Benign



neglect is mostly displayed by the users as if they are against the implementation of the ISs. They may refuse to take part in making the system successful. This is also linked with resistance to change. Employee may refuse to stay on track due to a number of reasons key amongst them is if they were not consulted at the initial stages.

### **i) Inadequate Staffing**

Inadequate Staffing is another challenge in implementation of ICTs. Organizations do not always have enough staff available for the successful implementation of new ICT systems. Inadequate staffing means that the library may be unable to perform necessary activities such as testing and may significantly affect the time scale of the project (Burke et al, 2001).

Turbit (2005), points out poor project management as a major challenge in ICT implementation. Very few organizations have the experience in house to run such a complex project as implementing a large-scale integrated solution. Many institutions usually engage outside contractors to come and manage the implementation process. Implementation of projects needs involvement of senior executive to ensure that the right participation mix of business and IT is done and to resolve conflicts.

According to Gichoya (2005) the factors for ICT failure are poor infrastructure, inadequate finance, poor data systems and lack of compatibility, inadequate skilled personnel, leadership styles, and culture, and bureaucracy, attitudes. Gichoya (2005), points that, inhibitors do not necessarily prevent the implementation of ICT projects but they do prevent advancement and restrict successful implementation and sustainability.

## **2.8 Critical Success Factors (CSF) for Automated System Implementation**

A Library Information Management System (LIMS) is a database for comprehensive library management. As such a number of authors have contributed to the Critical Success Factors (CSF) in LIMS implementation. These factors have been considered to be critical for automated LIMS implementation as discussed below:

### **a) Effective Communication**

Communication across the different levels and functions of an organization is necessary for success in ICT implementation. Nah et al. (2003) believed that effective communication of requirements, direction, mission, plan, user input, feedback and changes is critical to all stages to ICT implementation. Kim et al. (2005) suggested that communication is essential for creating approval and widespread understanding and acceptance of ISs. Additionally, effective communication has a large impact on the success of change management efforts during a project. Somers and Nelson (2004) argued that all employees, even those not on the project team, should be aware and made a part of a project. Further, they advised that strong communication throughout the various stages of the implementation is essential in allowing employees to understand what is going on, why change is necessary, and how it will benefit the organization.

### **b) User Training and Education**

ICT systems are extremely complex systems and demand rigorous training. All users must be trained to take full advantage of the system's capabilities. Education and training refers to the process of providing management and employees with the logic and overall concepts of ICT system and understanding how the automated system should be

integrated into the overall company operation (Yusuf et al., 2004). Nah et al. (2003) suggested that adequate training can increase success of ICT systems and lack of proper training can frustrate ICT users. Moreover, training decreases levels of resistance and increases ease of use, which in turn enhance success possibilities of ICT systems' use (Bradford and Florin, 2003). On the other hand, inadequate or lack of training has been one of the most significant reasons for failure of many ICT systems (Somers and Nelson, 2004).

#### **c) Library Information Management System (LIMS) Vendor Support**

Like any other IS project LIMS requires a wide range of skills and technical implementation knowledge (Davenport, 2000). LIM systems, are a lifelong commitment for many libraries, and as such require continual investment in new modules and upgrades to add functionality, achieve better fits between business and system, and realize their strategic value. It is not often that the ICT/systems librarian possesses all knowledge about the system. Therefore, libraries implementing ICT systems should supplement the skill sets of their internal teams with implementation resources from a software vendor or consulting firms that offer the requisite skills and knowledge (Willcocks and Sykes, 2000). Alternatively, librarians can adopt open source softwares that are bought or downloaded and customized to suit individual library needs hence reducing or eliminating resistance.

#### **d) Teamwork and Composition is Important**

Nah et al., (2003) observed that The ICT team should consist of the best people in the organization. They also noted building a cross-functional team as critical. They observed

that team should have a mix of consultants and internal staff so the internal staff can develop the necessary technical skills for design and implementation. Both business and technical knowledge are essential for success.

**e) Top Management Support**

Top management support is needed throughout the implementation. The project must receive approval from top management and align with strategic business goals. Top management needs to publicly and explicitly identify the project as a top priority senior management must be committed with its own involvement and willingness to allocate valuable resources to the implementation effort. This involves providing the needed people for the implementation and giving appropriate amount of time to get the job done (Nah et al., 2003).

According to Hammoud (2008), three critical components for an ICT project success are people, processes and technology. From these three, people are the most important but that does not mean that the other components could be neglected. Kavanagh & Thite (2009) provide success factors in ICT implementation as top management support; provision of adequate and timely resources; ongoing communication; conducive organizational culture and user involvement. Thornhill et al (2007), in agreement with the forgoing add that, training and development is a time honored method of seeking to change the attitudes and behaviors of employees

Recklies, (2001) looks at experiences with a particular change project as another success factor. The following tips are provided means of improving acceptance of change in an organization:

- Be open-minded for new ideas. Do not sort out options and ideas until a final decision has to be taken.
- Protect new ideas from criticism.
- Listen to suggestions and appreciate good ideas.
- Eliminate the “We have always done it that way”-culture. Move your employees and the whole organization out of the comfort zone.
- Learn from mistakes in the past.
- Focus on the good aspects of a new idea rather than on potential problems.
- Share risks.
- Build upon ideas.
- Do not make your judgment on ideas and suggestions too early.
- And again: let your employees participate in *all* phases of the change process. Build commitment.

Libraries like any other organization need change /project managers. As noted by Clements & Gido (2009), there are some things that a project manager can do to facilitate implementation of ICT changes. These authors cite, open communication and a climate of trust as prerequisites for introducing change, reducing resistance to change and gaining commitment to the change.

As mentioned earlier in this study, a large portion of ICT projects end up not meeting the set goals or even fail completely. There are many reasons to the high failure rate as discussed above. As viewed by Sherer et al. (2003) most successful projects stress the importance of overcoming resistance to change. In addition to this, effective communication is considered to be the most efficient way of doing this. People try to avoid situations filled with ambiguity, because ambiguity usually means the loss of predictability. Because of this, resistance to change occurs in every change initiative and it should be anticipated as a natural human behavior. However, it should also always be dealt with and as stated, communication is the most efficient way for it.

Kemp & Low (2008) explain that whenever implementing an ICT system users require ongoing support from the organization in order to achieve implementation effectiveness. Ongoing support mainly means training, maintenance and equipment upgrades, training being the most important during the implementation of the new system. User involvement and user training can impact user's feelings towards a new system.

## **2.9 Chapter Summary**

This chapter has presented the theoretical framework upon which the study is based. Three models - Nolan, Norton (1976), Lewin's (1946) and Kotter's (1996) theories of change which informs this study have been reviewed. From the literature above, it is clear that although the reasons for system migration and change revolve around technological considerations, the impact falls on people hence management of change is fundamental if libraries are to respond successfully to technological changes and developments.

Change management strategies that are important in ISs implementation such as user/employee involvement, communication, training and top management supports have been discussed. According to Clark and Morris (1998), system migration presents librarians with difficult decisions. Automated systems represent huge investments of time and money and the wrong choice can lead to significant problems over a long time period. System migration/change is a recurring event and as many libraries find their present systems unsatisfactory, they are facing system migration for the first, second or even third time.

The world of library automation is a vital, changing environment. Systems are changing rapidly. The ability to plan ahead and be prepared to change systems is critical. Automation is a continuous process and thus as libraries purchase one system they should be planning for the next hence confirming the fact that change is continuous. The next chapter provides the research methodology as applied.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

Ghuri & Gronhaug (2010) defines methodology as "... methods comprising the procedures used for generating, collecting, and evaluating data". It is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. It reveals the various steps that are generally adopted by a researcher in studying his research problem.

These steps usually involve the research methods or techniques that are used to conduct the study and the justifications for adopting those techniques. This chapter discusses the methodology adopted by the researcher in carrying out this study. It includes:- the research design; target population of study; sample and sampling techniques; description of instruments and tools used in data collection; the techniques used in data analysis; and research ethical considerations.

#### **3.1 Research Design**

A research design is a plan showing how the problem of investigation will be solved. According to Ghauri & Gronhaug (2010), a research design provides a plan or a framework for data collection and its analysis. It reveals the type of research and the priorities of the researcher.



### **3.1.1 Qualitative Research Design**

This study adopted a qualitative approach. Cresswell (1994) defines qualitative research as an inquiry process of understanding, based on a social or human problem, focusing on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting. It is a subjective way to look at life as it is lived and an attempt to explain the studied behavior. Instead of providing a broad view of a phenomenon that can be generalized to the population, qualitative research seeks to explain a current situation and only describes that situation for that group. Hence qualitative research methods are used to give in depth information on the subject studied.

Qualitative approach was preferred due to the nature of this study. Analysis into the LIS implementation dynamics calls for a qualitative approach to provide a holistic understanding of the process, players involved and their roles, environmental influence, factors influencing choices made and how, amongst others.

### **3.1.2 Case Study**

According to Kothari (2004) a case study is an in-depth investigation of an individual, group, institution or phenomenon. As noted by Yin (2002), case studies are the preferred strategy when “how” or “why” and “what” questions are being posed with the focus being on a contemporary phenomenon within some real-life context.

The case study was deemed appropriate for this research considering the uniqueness of the problem to the case under study. CUEA library case is unique in that the library has implemented three automated LIS over the last ten years. This is a short period

considering the system life cycle and cost implications. Case study method allows an intensive study of the selected units to acquire in-depth understanding of the context and process of automated library system implementation such as that at CUEA. This is significant as respondents were required to give their descriptive reflection of how things happened and consequences of steps taken, among others.

### **3.2 Study Area**

The research study was based at The Catholic University of Eastern Africa (CUEA) library that is located in Nairobi off Lang'ata Road. Data was collected from all library staff, ICT department and administrative staff and general CUEA library users including faculty staff.

### **3.3 Study Population**

According to Mugenda and Mugenda (1999), population refers to an entire group of individuals, events or objects having a common observable characteristic. Mugenda & Mugenda (1999) point out that a population is the total collection of elements about which researchers make some inferences. As stated in the scope of this study, this research was confined to analysis of change management approaches in the implementation of automated library systems at CUEA library. The study population comprised of all the CUEA library senior staff (Deputy University Librarian, Heads of CUEA Library departments-Circulation, Cataloguing, Serial, Acquisition, Reference and System Librarians); nine(9) library staff (Assistant Librarians) working in the library departments; and Library users (faculty staff, CUEA ICT administrative staff and Students). The study respondents comprised of 8 CUEA library senior management staff,

9 library staff working in the library departments; 26 Faculty staff (lecturers); 23 Students and 3 CUEA ICT.

### **3.4 Sample Design**

According to Kothari (2004), a sample design is a definite plan for obtaining a sample from a given population. It therefore refers to the technique or the procedure the researcher would adopt in selecting items for the sample. Kothari (2004) points out that sample design is determined before data are collected.

Leedy & Ormrod (2010) add that the size of the sample depends on how homogeneous or heterogeneous the population being studied is. However, Patton (2002) observes that qualitative inquiry typically focuses in depth on a relatively small sample, even single cases.

Nonetheless the sample size must be representative, manageable and open for as long as new data emerges till saturation point is arrived at. Two sampling methods were used: purposive and snowballing.

### **3.5 Sampling Procedure**

#### **3.5.1 Purposive Sampling**

This method was used to select the initial ten (10) set of students, faculty, ICT administrative and library staff. In purposive sampling, the researcher decides what needs to be known and sets out to find people who can and are willing to provide the

information by virtue of knowledge or experience. She selected participants who had knowledge or experience in the area being investigated.

Purposive sampling draws its sample with a purpose in mind (Wadsworth 2007). It allows a researcher to select a sample or use cases he/she believes will provide the data he/she needs (Fraenkel and Walle 1993). Purposive sampling is useful in situations where the study needs to reach the targeted sample quickly and where proportionality is not the primary concern. It is characterized by the use of judgment and deliberate effort to obtain a representative sample by including presumable typical areas of the group in the sample (Kerlinger 1986). It targets a group of persons considered to have the required information with respect to the objectives of the study or information rich cases (Mugenda and Mugenda 2002 and Kombo 2009).

Bernard (2002), adds that purposive sampling technique, also called judgment sampling, is the deliberate choice of an informant due to the qualities the informant possesses. It is a non random technique that does not need underlying theories or a set number of informants. Simply put, the researcher decided what needed to be known and set out to find information rich people who were willing to provide the information by virtue of their knowledge or experience. The sampling criterion per group is as below:

### **Student's Sampling Procedure**

Accordingly therefore, one of the first things the researcher did was to verify that the respondents met the criteria for inclusion which required that the student respondents

were active users of the library services. The initial ten (10) students were selected based on year of study starting from 3<sup>nd</sup> to 4th year, who had lived through to witness at least two Library Information System. Same case applied to members of staff who had lived through two of the transitions to recall facts as they were. She selected student informants after studying the library system which provided details on active library users. The library staff also referred the researcher to most active and long serving student library users, faculty members and ICT administrative staff.

### **Faculty/ Lecturers Sampling Procedure**

Faculty staffs were selected based on their years of stay at CUEA (only those who had lived through two of the library system transitions). The researcher targeted five lecturers in each faculty. From each faculty, pay roll numbers (employee numbers) were used as well as referrals from the library staff to determine those who qualified for inclusion.

In sampling out lecturers, a list of all the six faculties at CUEA was formed. Sample of 5 lecturers was drawn for the interview at random. 5 lecturers per faculty were interviewed apart from the faculty of law and theology where the researcher managed to interview only three lecturers. Thus, a total of twenty six (26) faculty staff was interviewed. Point of saturation was ultimately used in the field to determine the actual number of respondents.

### **Sampling of ICT Administrative Staff**

ICT department at CUEA deals directly with ICT related issues at the university and therefore stood a better chance of providing exhaustive information about ICT policy and automated system changes at the university. Three ICT Departmental staffs were

interviewed and of the three provided information on the ICT policy at CUEA and their involvement in the automated system implementation at library.

### **Sampling Library Staff**

University Librarian (UL) and deputy University Librarian (UDL) were selected purposively as informants. They were the overall managers of the information resources in the university. The two were long members at CUEA library and thus had key information regarding the library automation history and experiences with each system.

All other librarians and heads of library departments were purposively selected as informants. CUEA library heads of departments (system, circulation, acquisition, cataloguing, serial and reference) librarians were selected since they deal with user training and publicity of the system. They also get usage statistics and user's reactions to the system as reported to them. The responses of these staff were instrumental in detailing the use and application of the automated library systems at CUEA Library. The library staff understood the challenges faced in use and implementation of automated library systems at CUEA.

When using purposive sampling, there is no mathematical calculation to determine the ideal number of informants. Instead, this is based on informed judgment and an emphasis on securing information from a cross-section of population groups targeted. In all cases, the sample size must be small enough to be manageable but large enough to generate useful information. In this case the researcher purposively selected informants in terms of

their willingness to participate, availability and who were well informed in relation to research area. The research initial target was ninety one (91) subjects as tabulated/presented below in table 3.1:

**Table 3.1 Sample Population and Size (n=100.7)**

<b>Group Category</b>	<b>population</b>	<b>Sample size</b>	<b>Data Collection method</b>
CUEA Library staff			Interview
<ul style="list-style-type: none"> <li>• Senior management staff</li> </ul>	8	8	
<ul style="list-style-type: none"> <li>• Other library staff</li> </ul>	18	9	
Head of ICT department	1	1	Interview
Faculty (lecturers)	150	30	Interview
Students	50000	40	Focus group discussion
CUEA Departmental staff( ICT & Administrative staff)	300	3	Interview
<b>TOTAL OF ALL GOUPS</b>	<b>5477</b>	<b>91</b>	

### **3.5.2 Snowball Sampling**

Snowball sampling also known as chain referral sampling is considered a type of purposive sampling. The research used snowball sampling in selecting research subjects. The researcher was referred to active student library users by the librarians. The researcher also studied the library system which helped identify ten (10) individuals students who were relevant to the study and then asked/requested each of them to locate three (3 x 10= 30) other useful participants who would be available in the agreed time for focus group discussion. This made a total of forty (40) respondents under snowball.

The research selected primary set of participants used their social networks to refer the researcher to other participants who were willing to participate or contribute to this study. The research used snowball sampling process based on the assumption that a ‘bond’ or ‘link’ existed between the initial sample and others in the same target population, allowing a series of referrals to be made within a circle of acquaintance (Jackson, 2009).

Through this sampling technique, the researcher intended to gather four groups of ten students each for participation in focus group discussions.

### **3.6 Data Collection Methods**

This being a qualitative research; and in view of the in-depth nature of the study, data was collected using face to face interviews and focus group discussions methods. The two methods, lead to comprehensive and reliable data. Interview schedules were designed to include semi-structured questions which were used to facilitate in-depth probing and prompting interviewees.

#### **3.6.1 Interviews**

An interview is a two way purposeful conversation initiated by an interviewer to obtain information relevant to a research program. This technique is a verbal method of inquiry. An interviewer aims at gathering data in depth. It is an exchange of ideas and experiences.

Kothari (2004) describes interviewing as a conversation with a purpose. Interviews give an opportunity to establish rapport and greater flexibility in collecting information since the interviewee and interviewer are both present. It is the best method for collecting data



about the respondents themselves, their experiences, their opinions or attitudes, their knowledge, and their reactions to trends and developments.

The interview guides/schedules were structured and formalized using standardized questions for each respondent depending on the category of staff. Using the semi structured interview schedule, the researcher asked questions that simply required her to check the participant's response and those that were intended to lead the respondent in giving in-depth data to meet the study objectives.

The researcher made sure that prior arrangements were made with library staff and lecturers for interview arrangements. She had one-on-one purposeful discussion with the CUEA library staff, faculty staff and ICT departmental staff. At the beginning of each interview, the researcher observed social gathering decorum—greetings and introductions—and talked about the aim and objectives of the study while also expressing the interest in this topic. In addition, the researcher reassured the participant about the confidentiality of all information provided during the interview. She interviewed a single person at a time.

The interviews were carried out at the interviewee's work place and were conducted at a pace consistent with the respondent's habits and availability. The interviewer collected data directly and personally from the respondents using an interview schedule and each interview session lasted an average of forty five minutes.

This method enabled the researcher to get detailed descriptions and in-depth information by discussing issues more openly and exhaustively. Furthermore, interview method proved to be more suitable when collecting factual qualitative data (views, opinions, perceptions, feelings and attitudes of the respondents).

### **Recording the Interview**

Note taking method was used to record data during the study. Mugenda and Mugenda (1999) recommend that the interviewer should record the respondent's answers exactly as expressed and that attempts should be made to summarize, paraphrase or correct bad grammar.

In pursuance of this recommendation, the researcher recorded the responses on the interview schedule paper which was being used as a guide, as the participant responded during the interview. In addition, she made some interpretive comments on the margin and also had a privilege to observe respondent gestures. The non-verbal behavior helped the researcher to verify interviewee's claims which provided an opportunity to probe the respondents further.

Slater (1990) supports this by observing that, a good qualitative interviewer should always be alert to visual evidence and sensitive to body language as a two – way communication process. Non verbal behavior amounts to information given off, as opposed to information given, as in verbal communication. Using this approach, the researcher was able to obtain satisfactory and complete responses as well as

supplementary information that was not included in the interview schedule, but was found relevant to the study. In addition, the researcher also made careful and systematic observation of facts as they occur in the course of nature. Observation implies the use of eyes rather than ears and voice. The Oxford Dictionary defines observation as “accurate watching and noting of phenomena as they occur in nature with regard to cause and effect on mutual relations”.

In this study, observation method was employed to observe the participants in their natural work environment. It provided first hand information and a better understanding of the use and application of the current automated library system rather than asking questions. Under the observation, the researcher gathered the information sought by observing. The investigator used this method to observe the system use and application in relation to library operations. The researcher among other operations library users using V-smart to self-check in and out their library materials.

### **3.6.2 Focus Group Discussions**

The researcher intended to have four (4) special groups with CUEA students in terms information rich cases. The groups were to be made of ten (10) students each, and the researcher had decided specific topics for discussion beforehand.

A recording list was made of the discussion and a tape recorder was used to keep the records. Use of focus group discussion helped produce a lot of information in a short time. It helped identify user perception towards automated library systems in terms of service delivery and operations. In addition, it helped explore library user ideas and

opinions on change management strategies for successful implementation of automated library systems.

### **3.7 Test for Validity and Reliability**

Patton (2002) states that validity and reliability are two factors which any qualitative researcher should be concerned about while designing a study, analyzing results and judging the quality of the study. According to Miles and Bhattacharyya (2007), Validity is the degree to which a test measures what it intends to measure and thus allows appropriate interpretation of results. A test measure is designed keeping in view specific purposes. It is the degree to which results obtained actually represent the phenomenon under study. As far as qualitative data is concerned validity is more important because the objective of the study must be representative of what the researcher is investigating.

Yin (2003) stated that trustworthiness, credibility, conformability and data dependability will be used to judge the quality of the research. Guba and Lincoln (1994), in their work 'Competing Paradigms in Qualitative Research' propose two key criteria for assessing validity in qualitative study; credibility (whether the findings are believable) and transferability ( whether the findings apply to other contexts).

Again, Sarantakos (2005) offers some other concepts associated with validation in qualitative research; validation, meaning findings be supported by other studies and be evaluated by respondents; argumentative validation, conclusion should be followed and tested. Huitt, (1998) opines that researchers should be concerned with both external and internal validity. External validity refers to the extent to which the results of the study are

generalizable or transferable. Many qualitative research studies are not designed to be generalized and hence this study would be concerned with internal validity.

Internal validity refers to:

- The rigor with which the study was conducted; that is the study's design, the care taken to develop measurements, and decisions concerning what was and was not measured.
- The extent to which the designers of a study have taken into account alternative explanations for any casual relationships they explore.

Reliability refers to the stability and consistency of the results derived from research to the probability that the same results could be obtained if the measures used in the research were simulated. Essentially, reliability is concerned with the consistency, accuracy and predictability of specific research findings.

As viewed by Seale (1999), to ensure reliability in qualitative research, examination of trustworthiness is crucial. According to Welman et al.(2005), reliability is concerned with the finding of the research and relates to the credibility of the findings. Therefore, the reliability of the study should be based on the whole research process. Eskola and Suoranta (2005) explain that the reliability of a research can be ensured by using high quality data, planning carefully the interview outline, planning additional questions in advance, analyzing the interview data carefully and by giving the interviewees an opportunity to comment on the interpretations of the interviewer. In this study, these factors were taken into consideration.

In addition to the set of questions, further probing during the interviews was used to gain additional information to a specific questions/topic. The interviews were recorded to be able to gain a realistic and thorough picture of the opinions of the interviewees when transcribing the data.

### **3.8 Data Reliability and Validity**

#### **a) Review of Data Collection Instruments**

In order to ensure reliability and validity of data collected during this study, the researcher reviewed the instruments with peers and consulted group of experts comprising of seasoned researchers for purposes of examining the contents and the validity of the instruments. This helped increase the degree to which the instruments gathered the information intended. The researcher also applied various techniques to ensure data validity and reliability is achieved:-

#### **b) Triangulation Method**

To improve validity and reliability of the research instruments, she applied the triangulation method by combining interviews methods and observations. This enabled her get first hand information and a better understanding of the use of the current library system (V-smart) rather than asking questions only. It provided the researcher the opportunity to observe and verify interviewees' responses.

#### **c) Member Check Method**

According to Guba and Lincoln (1994), member check method is a procedure of confirming with the participant that the data recorded is the true record of the information the participant gave. Member check method is a useful tool for capturing the participant's

perspectives as accurately as possible as well as for guarding against the researcher's biases. Every time the researcher was in doubt or required further clarification, this method was employed.

#### **d) Interview Schedules Construction**

To ensure validity, the researcher came up with interview schedules that had systematically listed questions pertaining to all that the researcher wanted to find out during the research. The schedules were in line with the research objectives, research questions and the researcher's assumptions. The researcher strictly made use of these schedules throughout the entire data collection period and probed for more information when necessary.

#### **e) Politeness and Receptive Approach**

Denscombe (1998) notes that empirical literature on interviewing has demonstrated fairly conclusively that people respond differently on how they perceive the interviewer (the person asking the questions). The researcher opted to be so polite, punctual and receptive throughout the interview in order to encourage the right climate for the participant to feel comfortable and provide honest answers.

### **3.9 Data Presentation and Analysis**

Data analysis is the process of bringing order, structure and meaning to the mass of collected data (Marshall and Rossman, 1999). Mugenda and Mugenda (1999) note that, data obtained from the field is in raw form and is difficult to interpret. They state that such data must be cleaned, coded, keypunched into a computer and analyzed since it is from the results of such analysis that researchers are able to make sense out of the data

collected. The mass of raw data collected after administering the measuring instrument must be systematically organized.

Marshall and Rossman (2006) observe that qualitative data analysis seeks to make general statements on how categories or themes of data are related. In qualitative research, data is in the form of text, materials, photographs among others, which describe events and occurrences. Data collection and analysis in qualitative research go hand in hand and are done simultaneously.

After the data was received from the field, it was reviewed for any inconsistencies, organized and then analyzed thematically by use of research questions, that is the open-ended questions and responses from the interview guide and focus group discussion guide. The researcher organized data in terms of the emerging themes from the analyzed data and as are carried in the research questions.

The interview schedules were divided into six main sections; personal information, use and application of automated library systems, reasons for change of automated systems, approaches used in automated system implementation, perception and attitudes of library users and staff on change of these automated systems and challenges in the implementation of automated library systems respectively.

The collected data was then analyzed according to these six main categories and presented under various research question themes by use of descriptive narratives. Data was presented in the form of tables and charts where necessary. She employed her analytical, interpretative and writing skills in interpreting the data and drawing



conclusions. This method of analysis is known as thematic analysis. The procedure used by the researcher in data analysis included the following steps:-

**a) Data Organization**

The researcher analyzed raw data collected using interpretations in order to find linkages between the research objectives and the outcomes with reference to the original research questions. The researcher started by reading the data thoroughly so as to familiarize herself with it.

During the recording process, the researcher used note cards to record data available. Interview notes were edited and cleaned up as data was being organized. Denscombe (1998) refers to this process as breaking the data down into units of analysis and categorizing the units.

**b) Data Categorization**

The researcher then created categories, themes and patterns; this involved the identification of themes and their inter-relationships. This essentially included identification of patterns and processes, commonalities and differences and establishment of the relationships among the different categories.

**c) Data Evaluation and Interpretation**

Data evaluation and interpretation was the third step the researcher took in data analysis. It involved evaluating, analyzing and interpreting information after identifying the themes, categories and patterns emerging. The purpose of this was to determine the

adequacy of information and the credibility, usefulness and consistency in responses to the research questions.

#### **d) Clarifications**

Lastly, as the various explanations and themes emerged from analyzing data, the researcher sometimes had to contact particular participants in order to check on their validity against reality. The researcher then refined a set of generalizations that explained the themes and relationships identified. This was then compared to the new generalized statements with existing theories or explanations.

### **3.10 Ethical Considerations**

According to Bak (2004) ...“if your research will involve people and or vertebrate animals as research subjects, you will probably have to include an ethics statement in your proposal”. The inclusion of ethics in any research is aimed at ensuring that no individual is subjected to any harm as a result of the research. The researcher observed all the ethical issues involved in the research. These included: ethical treatment of all the research participants with care, sensitivity and respect for their status.

The researcher endeavored to abide by the following research ethical issues;

**Research Consent:** The researcher adhered to the regulations and guidelines prescribed by Moi University for the presentation of thesis and dissertations. In this regard the researcher sought consent to conduct research from the ministry of Higher education, science and technology. The researcher then delivered a letter of introduction to the university librarian of CUEA library where the research was conducted.

**Informed consent:** the research was guided by the principle of informed consent. The researcher observed this by giving participants a clear explanation about the aim and objectives of the study and its significance to the institution and the participant. The participants were made aware that participation was voluntary.

**Anonymity:** the researcher assured the participant about the confidentiality of all comments made during the interview. She ensured that the respondents remain anonymous. She avoided the use of employees' names and use of their titles.

**Plagiarism:** to avoid plagiarism, authors are recognized and acknowledged in within the text and on the reference section.

### **3.11 Chapter Summary**

This chapter has discussed research methodology that was used in carrying out the study. The researcher adopted qualitative research design and employed purposive and snowball sampling to collect data from 91 respondents drawn from the CUEA library staff, ICT staff and library users including faculty staff. The location of the study has also been stressed out as CUEA library.

Other issues discussed include interviews and focus group discussions as the data collection instruments and procedures used; reliability and validity; data presentation, analysis and interpretation. The next chapter provides the research data presentation and analysis.

## CHAPTER FOUR

### DATA PRESENTATION AND ANALYSIS

#### 4.0 Introduction

The aim of the study was to investigate change management approaches in the implementation of automated library information systems at CUEA library. The aim of the study was to propose recommendations for successful IS implementation in the library. The target population was staff of CUEA categorized broadly as CUEA Library top management, other library staff, CUEA ICT administrative and Faculty/ academic staff. The study also targeted CUEA students as library users.

This chapter, therefore, presents and analyses data obtained from 67 respondents from the Catholic University of Eastern Africa (CUEA) library. In order to simplify the understanding of the factors investigated and ensure ease of matching pattern, concepts and explanation in the data, each set of data is presented, analyzed and interpreted separately under each theme section or subsection.

Data presentation is basically descriptive in nature while analysis is based on the study objectives so that it focuses on specific issues related to the change management approaches in the implementation of automated information systems at CUEA library. The study was undertaken using qualitative methods, hence, both structured interviews and focus group discussions were used to elicit information from the respondents. The analysis was done from the 63 respondents interviewed.

The chapter is divided into the following sub-headings based on the study objectives.

- Personal/Background information
- Use and application of automated library systems
- Reasons for change of automated information systems
- Approaches/procedures used in the implementation of automated library systems
- Perception and attitudes of library staff and users towards automated library Information systems
- Challenges and solutions

#### 4.1 Response rate

The total number of interviews successfully carried out is summarized in table 4.1:

**Table 4.1 Response Rate**

<b>Interviews</b>	<b>Targeted sample size</b>	<b>Interviewed</b>	<b>Percentage(%) of Total ( n=91)</b>
CUEA Library staff			
• Senior Staff	8	6	75
• Other library staff	9	9	100
Head of ICT	1	0	0
ICT administrative staff	3	3	100
Faculty	30	26	87
Students	40	23	58
<b>TOTAL INTERVIEWED</b>	<b>91</b>	<b>67</b>	<b>73.6</b>

As shown in table 4.1, the number of senior library staff interviewed was less than the target. This is because the head of reference department at CUEA library (reference Librarian) had moved to another employer and thus was not interviewed.

The University librarian was also not interviewed due to his busy schedule. However, the researcher had an opportunity to interview the Deputy University Librarian. The head of ICT was barely a year old at CUEA and thus was not interviewed; instead the research interviewed three (3) ICT administrative staff at CUEA to gather key information. The number of students who participated in focus group reduced from the targeted forty (40) to 23 students however this did not affect the results.

Reasons for nonparticipation did not include disinterest or unwillingness to assist in the research, but such factors as the CUEA having done a new student intake hence majority of the students had exited the campus since 2012. Out of the 23 students who participated in this research, two (2) groups of eight (8) and one group of seven (7) students were formed.

#### **4.1.1 Length of using the University Library Services**

To determine whether the respondents were adequately informed about the library services and automated systems in use, the respondents' relative length of interaction with the library system and number of systems implementation they had witnessed was established.

All the respondents (CUEA staff and students) indicated that they had been using the university library for the length of time they had been at CUEA. This is justifiable as 15 of the respondents were library staff while other respondents (lecturers, administrative staff and students) were purposively selected based on their active behavior of using the library services and their length of time they stayed in CUEA as students. This implies that all the respondents were in a position to provide the required information.

Four (4) who had all witnessed the system migration to KOHA were all members of the senior library staff. Most of the users and staff who may have also witness KOHA migration had since left the university after the installation of Inmagic in 1999.

Eleven (11) of the library staff reported witnessing both KOHA and V-Smart implementation. Of the eleven (11) library staff reported that KOHA system was only limited implemented to internal library service operation -cataloguing and consequently the end library users were not exposed to it.

All the 67 respondents indicated that they had witnessed V-smart installation. Of these, 52 indicated witnessing Inmagic migration to V-Smart. It was found out that KOHA implementation remained internal and was only used by library staff. This is reflected on table 4.2:-

**Table 4.2 Witness of Automated Systems Implementation**

<b>Systems Implemented</b>	<b>Year Implementation</b>	<b>Witnesses of Implementation (N=67)</b>	<b>Percentage</b>
INMAGIC	1999	4	5.97
KOHA	2010	11	16.4
V-SMART	2011	67	100

#### **4.2 Use and Application of Automated Library Systems**

The first objective of this study was to establish the use and application of automated information systems at CUEA library. The study sought to determine how the current and previous systems were used in delivery of library operations and services at CUEA library. To audit the range of the automated systems application in the library, the study asked CUEA library staff, students, faculty and ICT administrative staff about the applications supported by Inmagic, KOHA and V-Smart systems.

All the 67 respondents indicated that they used Inmagic for searching database Online Public Access Catalogue (OPAC). This was true as Inmagic was still running parallel with V-Smart in 2012 to 2013 when it was phased out. Additionally a few of these students had been to CUEA for longer while undertaking their undergraduate and post graduate studies. Fifteen (15) of the respondents indicated that they used Inmagic for cataloguing process. These 15 were the library staff.

Fourteen (14) of the respondents said that KOHA was only used in-house (in the library by library staff) for cataloguing as data was being migrated from Inmagic to KOHA and thus it never went live to library users. While the 52(n=67) said that they never used



KOHA as they did not know about its implementation. The other 1 (n=67) found KOHA running parallel with Inmagic but used Inmagic and not KOHA.

The respondents were first asked whether they ever used the current system to access information and their confidence in use of the system to access information using V-Smart. The aim of this question was to establish whether CUEA library users had basic information on how to use V-Smart.

All the 67 respondents interviewed had used the current library system to search OPAC and access the library. The research observed that all the respondents had user identification cards/tags which they used to access the library. The library security system is integrated to Radio Frequency Identification Technology (RFID).

All library staff reported that they used the system for cataloguing and classification processes; Circulation processes such as self check borrowing, returning, automatic alerts, statistics, reservations, Electronic payment for overdue items and loan renewals; serial management; reference services while 52 users ( Faculty, Students and ICT administrative staff) used the system to access the library, self checking of their library materials ( borrowing and returning), paying their fines through electronic payment using ATMs, luggage storage at the library luggage area, but all (67) used V-smart for catalogue searching (OPAC) as shown in table 4.3.

**Table 4.3: Use and Application of Automated Library Systems**

<b>SERVICES/SYSTEM USE</b>	<b>INMAGIC</b>	<b>KOHA</b>	<b>V-SMART</b>
Cataloguing	15 (library staff)	14 (library staff)	15 ( library staff)
OPAC	67	–	67
Circulation	–	–	15
Serial management	–	–	15
Reference services	–	–	15
Self check	–	–	52
Fine payment	–	–	52
Luggage storage	–	–	52
Library access	–	–	52

It is clear from the table that the library's other operations such as circulation acquisition; serial management among others remained manual even with the implementation of Inmagic since 1999. The library staff further confirmed that all other services were manual and that the library was using brown system in circulation processes and management.

All the 52 library users (Faculty, Students and administrative staff) indicated that they never used KOHA and that they were not aware of it being implemented. The research sought to confirm this from the library staff who indicated that KOHA implementation never went live to library users rather it remained confined for internal use only-cataloguing.

When one compares these findings with the literature in this study, it is evident that V-Smart implementation is a success as compared to Inmagic and KOHA systems. This is so as all V-Smart functional modules except acquisition have been implemented. This is supported by Reddy (2001) observation that, the basic components of an integrated

library system are the cataloguing module, the OPAC and the circulation module. Other modules which may be present are serial management and acquisition modules.

### **4.3 Factors for Change of CUEA Automated Library Systems**

The second objective of this study was to find out the factors that necessitated the need for change of automated library systems at CUEA library.

The research first sought to know if the respondents had experienced any problems with the previous systems. All the sixty seven (67) interviewed admitted to have had problems/challenges with the previous systems.

#### **4.3.1 Factors for CUEA Library Migration From Inmagic to KOHA**

Four of the library staff who witnessed Inmagic implementation reported that INMAGIC only supported a limited service, that is, cataloguing and OPAC. The researcher additionally sought to know if Inmagic was made to support cataloguing and OPAC functions only.

The four reported that Inmagic was meant to support other library functions like circulation but faced challenges in implementing these other functions as they lacked internal skills and had no vendor support. They also reported that they were not involved in Inmagic acquisition and thus Inmagic was like “imposed” on them. As such they did not understand Inmagic implementation leading to them implementing two functions.

All the 52 library users ( faculty, students and ICT administrative staff) reported that, despite the presence of Inmagic 90% of the library operations remained manual including document transaction processes (circulation such as: borrowing and returning) presenting

challenges in services received. They admitted that CUEA library manual system (Brown System) in use at the time was chaotic with a number of errors:-

- a) The manual circulation system led to multiple issuing of library cards; lose of the cards, malpractice in unauthorized persons using another person's card. All these led to original owner being embarrassed and sometimes having to pay for lost or delayed return of library items.
- b) Overcharging library users (borrowers) in regard to overdue library fines.
- c) The system was time wasting often leading to delay and hence a number of users avoided any service which involved queuing hence borrowing and rather resorted to reading the books in the library instead. Quoting one of the respondents,
 

*R1... "Rather than queuing to borrow a book for home use I would rather just read it off the shelf in the library"*
- d) The users said it was difficult to search for materials as Inmagic was complex.

Library staff also had a number of concerns as reasons for change from Inmagic to Koha

- All the 15 reported that INMAGIC was only limited to cataloguing and OPAC operations and as such, it failed in serving the intended purposes such as acquisition, circulation processes, and borrower records management.
- They all reported that INMAGIC was a standalone and that it could not multitask. They thus needed a system that could multitask hence save time in literature searches and preparing bibliographies.
- They all said the need to keep abreast with new technologies made the library migrate to KOHA.

- Five of the library heads of departments (senior staff) reported that Inmagic proved difficult integrating with other technologies. Thus they changed to KOHA as it was possible to integrate with other systems and multitask. However; they later realized that KOHA had a shortcoming as it proved to be incompatible with new technological solutions such as RFID technology.
- Four of the CUEA library staff reported that Inmagic had inadequate report generation and thus they needed a system that was capable of generating reports and enhance decision making. As reported by one respondent

*R2 “...with Inmagic in place, most of the library operations like patron records and circulation remained manual.....it was difficult to generate reports like for books on high demand, overdue items etc..”*

- Six senior staff of the library reported that user demanded for improved services especially with circulation services. As expressed by one of the respondents

*R3 “...every time the library carried out user needs survey it turned out that the library scored less in its circulation services.... This therefore called for improved service delivery hence change of library system”*

Summary of the factors for change from Inmagic to Koha is presented in table 4.4

**Table 4.4 Reasons for Change of Library System From Inmagic to KOHA**

<b>Factors</b>
<ul style="list-style-type: none"> <li>• Limited Functionality</li> </ul>
<ul style="list-style-type: none"> <li>• Multitasking/multi user capabilities (Inmagic was a standalone)</li> <li>• Technological Changes</li> </ul>
<ul style="list-style-type: none"> <li>• User demands</li> </ul>
<ul style="list-style-type: none"> <li>• Need for integrated system ( Inmagic was difficulty integrating)</li> </ul>
<ul style="list-style-type: none"> <li>• Lacked expertise to implement other functions</li> <li>• Lacked vendor support</li> <li>• Inmagic was imposed ( users not involved in its acquisition)</li> </ul>
<ul style="list-style-type: none"> <li>• Need for improved productivity and generation of reports for decision making</li> </ul>

#### **4.3.2 Factors for CUEA Library Migration from INMAGIC to V-Smart**

Following realization that CUEA library users never knew of KOHA, 30 library users were for the view that, the library changed its system from Inmagic to V-Smart to enhance its reputation due to the fact that they had put up a state of the art modern library, while, all 52 library users cited technological changes as one factor why the library system was changed. 23 said the system was changed as the library management needed a system that would help manage library resources in a better way. They pointed out that library resources were more secure as a result of V-Smart integration with RFID system and CCTV cameras. 29 said that the system was changed to help save on user time, money and manpower. Two of the library users had observed that circulation desk which was previously manned by six persons before implementation of V-Smart, was (by

the time of this data collection) being manned by one staff. The 29 also said the system was changed to ease the use as the previous one was complex and complicated.

#### 4.4.3 Factors for CUEA Library Migration from KOHA to V-Smart

From KOHA to V-Smart 15 library staff had a number of concerns as reasons for change:

- Three of the library staff cited technological advancements and the need to be on the cutting edge of technology as a major reason for change. They said they wanted a self check service system where library users would borrow and return on their own.
- Five of library top senior staff reported that KOHA had a shortcoming as it proved to be incompatible with new technological solutions such as RFID technology.
- Six of library staff reported that users demanded for improved services
- Two of the library staff reported that the rapid migration from KOHA to V-smart was triggered by the new modern library building and that the library sought to be reputable in terms of technology use.

**Table 4.5 Factors for Change of Library System from INMAGIC-KOHA to V-Smart**

<b>Factors</b>
<ul style="list-style-type: none"> <li>• Technological changes</li> </ul>
<ul style="list-style-type: none"> <li>• Reputation</li> <li>• Changes triggered by the modern building ( user ego)</li> </ul>
<ul style="list-style-type: none"> <li>• User demand for improved services especially circulation</li> </ul>
<ul style="list-style-type: none"> <li>• Need for integrated system ( KOHA was difficulty integrating with RFID technology)</li> </ul>

Compared to the reviewed literature, lack of system implementation skills, lack of vendor support, rapid changing technology and user demands for more sophisticated searching techniques are some of the factors necessitating libraries replacement of their present/existing automated systems. Hallmark and Garcia (1992) highlight technological developments and need for additional system functionality as major factors resulting to high rate of change of automated library systems.

#### **4.4 Approaches /Procedures used in Implementation of Automated Library Systems**

The third objective was to examine approaches or procedures used in automated system implementation at CUEA library. To obtain this information, the library top management was asked to define their understanding of the term “Change management”. The total number of respondents who answered this question were 6 library top management staff who are directly involved in implementing library changes.

In a brief review of the literature, change management is a systematic approach to dealing with change both from the perspective of an organization and on the individual level. It is a process of achieving the smooth implementation by planning and introducing it systematically, taking into account the likelihood of it being resisted.

Change management entails involving stakeholders and managing their expectations, creating a common vision (desired future) and working on strategies to getting there. As “Success is achieved when a business change is introduced and employees have the



awareness and desire to implement the change, the knowledge and ability to make it happen and reinforcement to keep the change in place” (Hiatt and Creasey, 2003, p.39).

All the six (6) interviewed senior library staff had a common view of change management as a process of managing the intended change within the current establishment capturing both the library staff and user expectations. As exemplified by one of the respondents

*R4“.....change management entails smooth transition of both the organization (library) and those involved (staff and users) from the present to a desired future.....it is simply preparing the users to accept the new change of library system taking into considerations their reasons to resist and assuring them”.*

Asked why they had such a common approach towards change management definition, the respondents said they had attended a change management workshop before V-Smart implementation. Their understanding of change management was relevant and in agreement with the literature.

The system implementation process follows planning, system investigation, system design, and implementation (Kavanagh & Thite 2009). However, that seemed not to have been followed with INMAGIC implementation. From previous responses it was established that INMAGIC was more of imposed to users and therefore the researcher sought to find out if Koha and V-Smart implementation had a systematic approach in their implementation.

#### 4.4.1 How Koha and V-Smart Systems were Introduced

CUEA library senior staff were asked to describe the process of implementation followed in both systems. They all reported that in both cases the systems were implemented in phases starting with cataloguing.

With reference to Koha, the respondents indicated that at the cataloguing phase they realized Koha shortcomings and halted its implementation (year after). V-Smart was then taken up in the year 2011 starting with cataloguing and OPAC followed by Circulation, Serial management and by the time of collecting this data they were implementing Acquisition module.

Three out of the six pointed out that at the time of implementation of V-Smart around December, 2012, CUEA library run the three systems (INMAGIC, KOHA and V-SMART) parallel and all the three were being used in cataloguing. The three systems therefore run side by side and all the three were used in cataloguing for a while with the two earlier systems being phased off slowly. Quoting words of one library staff

*R5 “...Actually KOHA and INMAGIC died a natural death slowly by slowly and this offered CUEA library a gradual change to the overall new system during which library staff gained experience and confidence”*

It can therefore be deduced that CUEA library adopted albeit formal approach to system implementation as noted by Williams and Sawyer (2007) who list common approaches of change over as: Pilot running, phased, direct change over and parallel-running. However, system implementation involves a rather systematic approach as observed by Williams and Sawyer (2007). The authors report that system implementation is simply putting the

system into live operation. It involves data creation and conversion as well as changeover to new system and training the end user.

Changeover can be described as the take on- phase to the new system and it should be planned and effected at the most suitable time for a smooth transition to the new system. In this case CUEA library used both phased and parallel running in their system implementation.

The respondents also reported on the following other strategies:-

- **User Involvement**

The study sought to establish whether CUEA library users were involved or participated in the implementation of the current library system. All the study respondents were required to answer this question. 49 (n=67) library users (Faculty and students) said they were not involved in giving suggestions about the system but they were trained on how to use the system. Six senior staff reported that the library involved and incorporated ICT department in V- Smart implementation. The ICT department offered advisory services on systems evaluation and user requirement assessment.

All fifteen (n=67) library staff agreed that they were involved in system implementation process as V-Smart was a library initiative. They were trained on how to use the system among them was the implantation team and project leader for both library and general university while. They also participated in planning and implementation committees as well as assigned supervisory roles. They were also involved in training and helping the students and other library users master the system. Majority of the library staff were involved in data transfer from manual card system to computerized system. They were

mainly in charge of data entry regarding borrowers and what they had borrowed, creation of borrowers' accounts, profiles and keying in the library collection. This involvement helped in gaining staff commitment in the implementation process.

Although most library staff was kept informed of the implementation process, some felt that they were not adequately involved in the process. They said only the university librarian and systems manager were actively involved in the various phases of implementation.

The literature is in support of this as one of the keys to solving problems of end user resistance to new information technologies is end user involvement in the development of new information systems. User participation reduces uncertainty and leads to commitment. Library staffs involved in automation change are in a better position to understand the need for change and are motivated to support the change thus less likely to resist it. As noted by Clements & Gido (2009), there are some things that a project manager can do better to facilitate implementation of ICT changes.

- **Communication of Library Goals to users and Library Staff**

Asked how the library top management communicated its intentions and goals to users, majority of the respondents 44 (n=67) cited Meetings, Emails and Workshops, 23 (n=67) indicated Website, Notice boards, Facebook and Student representatives as the main means of communication used by the library. All the library senior staff said that they have an open door policy for users and as such they are involved in listening to what users may want to suggest.

Unlike in previous systems such as INMAGIC, all library staff said communication at every stage of implementation process made them pull through. At this point they felt that they were part of the process. This was important in understanding the role communication played at CUEA during the system change process.

The purpose of the Communication in change management is to contribute to the successful implementation of any change and especially in automated system implementation. On one hand, proper and good communication helps manage expectations of users and create awareness and understanding of the impacts and implications of the Implementation process of any new system. On the other hand, poor communication between management, staff and the change leader may make library staff and other users misinterpret the reasons for the introduction of a new system and improperly evaluate its benefits. In other words, poor communication may turn people off, cause worry, and convert potential advocates into opponents (Burke 2001).

- **Library user Awareness of and Training with the System**

The study also sought to establish whether CUEA library users were made aware of the systems used in the library. This was also to test the assumption that library users at CUEA University were not aware of the existence of the previous and the new library systems.

From the findings, the study established that CUEA library users were aware of the previous and current systems. From the list of library systems the university library had adopted, V-SMART topped the list with all the 67 (n=67) of the respondents indicating

awareness. This was followed by INMAGIC 57 (n=67), then 15 (n=67) KOHA, which means there was a low level of awareness of KOHA system. This supports the previous findings which indicated that KOHA was confined in in-house library operations.

A follow up question was addressed to both the students and faculty staff on how they came to know of the V-Smart system considering that they were not present during early stages of its implementation. Asked how they were made familiar and how they knew of the new system 52 (n=67) of the respondents reported that they got to know of V- smart system through:-

- **Informal communication from the library staff:** This implies that library staff is a significant point of contact in introducing V-Smart system to library users.
- **Library orientations and user education:** CUEA library organized for orientation that took them through the new system. They said after the orientations library staff offered one-on-one training to users.
- **Library visits:** that the library staffs were excited about the new system and thus would give users the news regarding the new developments, during the user's visits to the library
- They also cited CUEA website, library facebook and notice boards as channels used to communicate about the V-Smart.
- Thirty library users reported that the library staff walked the talk about V-SMART through their current awareness services. They kept informing users of new developments in the library and regarding V-Smart implementation.
- All library staff cited information literacy training and continuous practice as a form of communication used.

However out of the fifteen library staff, 5 said their familiarity with the system modules was limited to their respective core responsibilities such as circulation, reference, cataloguing, serials, acquisition and that they were not familiar with some modules. More to that, they said they required retraining as they felt that they had not mastered the system adequately.

Library orientations and user education and communication through library staff were particularly popular means in which library users knew of V-Smart system. This could be because the means are less formal. Only the library staff indicated information literacy and continuous practice as means on how they knew of V-smart. Though not verified this could be attributed to the fact that Information Literacy (IL) is a related new concept which most of the users are not familiar with. User system awareness plays an important role in facilitating change. Librarians believe in human and personal contact in creating awareness among users. User awareness of a given system is the first step towards the appreciation or rejection of that system.

#### **4.4.2 Other Approaches used in V-SMART Implementation**

The research sought to find out other approaches used in V-smart implementation. The respondents cited several approaches among them training, previous system analysis, use of structured approach, university support, involvement of university ICT department, sharing of ideas and knowledge between university libraries, employment an ICT system Librarian, parallel change over method, leadership and team work.

These approaches are discussed below as per respondent reporting:

- **Training:** all the 67 respondents reported that the library provided training to its staff and users. Through orientations and re-training of both users and library staff the users continue to master the new system
- **User readiness and willingness for change:** CUEA library users said that they had gotten tired of manual system and the confusion and inconveniences it had. 52(n=67) said V-SMART implementation was long overdue. They said they were ready for the change considering it was to improve library services delivery.
- **University Support:** 15 library staff said they lobbied for university support and that unlike the previous systems; the university management supported the library in V- Smart implementation. They had financial support, moral support and the management kept talking about V-SMART hence this created awareness of the system. The management also was involved in giving feedback to the library about the performance of the system
- **Previous system analysis:** 8 of the respondents said the library team first did an analysis of previous systems to identify the gaps. This helped them in avoiding repetition of the same mistakes they had with INMAGIC and KOHA
- **Structured approach:** 7 library staff said they followed a structured approach in V- SMART implementation. All key stages involved in system implementation such as problem identification system design, system testing and training of staff were followed.
- **Change over method:** 6 library management staff said that they used parallel change over where the three systems run parallel. V-Smart was implemented in phases starting with cataloguing module.



- **Sharing of ideas and knowledge between university libraries:** 4 library staff said that they severally visited University of Nairobi which was using an older version of V-SMART. They consulted and shared ideas unlike INMAGIC where they had no one to turn to.
- **Leadership and Team work:** 3of library staff said the whole v-smart implementation process was team work. The library had set groups which had been assigned different roles such as cataloguing, data entry for borrowers and other circulation details. They said leadership was vital in the entire process. They said the had team leaders and change leaders
- **Employed an ICT system Librarian:** one library staff reported that during KOHA and INMAGIC implementation they lacked skilled system librarian. In V-SMART implementation the library employed a system librarian with an ICT professional background.

Following Kotters (1996) and lewin (1946) change models, CUEA library seem to have followed the right process in V- Smart implementation. Kavanagh and Thite (2009) also agree in following a structured approach when they discuss System Development Life Cycle (SDLC) as discussed earlier in the literature. They incorporated elements such as planning, system investigation/analysis, design and implementation which entailed training among others.

#### **4.5 Perception and Attitudes of Library Staff and users towards Current Automated Library System (V-Smart)**

The Fourth Objective Was To Establish The Perception, attitudes and response of CUEA library staff and users towards automated library system. This was based on the assumption that CUEA library staff and users may have resisted the implementation of automated library system. To test perceptions and attitudes of library staff and users three elements were used:-

- a) Reaction of library staff and users
- b) University management reaction and perception.

##### **4.5.1 Reaction of Library Staff and users towards Automated System**

From data collected, there seemed to have less or no resistance as users expressed their feelings variably as indicated by some of the verbs used. Fifteen (n=67) of the respondents interviewed said the library staff and users welcomed the system, 6 (n=67) said automated systems are the best, 10 (n=67) were positively excited about the new technology, while 20(n=67) were enthusiastic and the other 16(n=67) said they were eager to learn the new technology.

Evidently, all the interviewees were positive of the library ICT system. Words such as “excellent”, “it is the best”, “enthusiastic”, “eager to learn” and “excited”, recurred frequently in their descriptions of staff and user response to the system. The study found that all the respondents appreciated the change and especially the self check off system as it saved on their time and improved on their services. They said it was long overdue.

All the senior library staff respondents said there was less resistance in V-Smart implementation. They said majority of the library users were excited about the system and were ready to learn.

#### **4.5.2 How Rapid Changes of Automated System has affected University Perception**

The study sought to find out how these rapid changes affected the university perception. This question was asked to six (6) CUEA library senior staff.

Two of the six respondents said the rapid changes in between KOHA and V-Smart implementation almost resulted into conflict with university management but the ICT department argued in support of the library. As it was put by one of the respondents

*R6..... “We agreed to disagree, but we finally reached a common understanding.”  
The library had debates and forums to explain to the university management why such turn of changes happening and as such, we supported and justified the changes.*

Three of the six respondents said that the library had carried out a scientific study on KOHA which brought out the issues of KOHA incompatibility. This research saved the library image from the university top management. It helped justify the whole aspect of changing to V-SMART. One of the six responded did not comment as he was not there when the rapid changes between KOHA and V-Smart were happening but came during V- Smart implementation. It can therefore be deduced that the library staff and user perception towards V-Smart implementation was positive.

#### **4.6 Challenges Experienced in Implementation of the Automated Systems**

The fifth objective of this study was to establish the challenges encountered by CUEA library in the implementation of automated systems. This was based on the fact that CUEA library had experienced rapid changes. The respondents indicated that they encountered several problems with the previous and current systems.

##### **4.6.1 Did the Past Automated Systems Fail?**

Following the rapid changes, the researcher sought to find out if the past CUEA library systems INMAGIC and KOHA could be regarded as failed in their implementation process expectations. The total number of respondents who answered this question were 15.

Eleven (n=15) of the respondents said INMAGIC failed as it had all the modules and only cataloguing and OPAC were utilized and thus failed to serve the intended purpose. They said, the fact that other key library operations remained manual since 1999 when INMAGIC was adopted to December 2011 when V-SMART was adopted, clearly indicated that INMAGIC implementation failed.

Four (n=15) said they did not think INMAGIC implementation failed as it served the intended purpose by then which was cataloguing and OPAC. They even said that the CUEA library benefited a lot from such adoption as it had union catalogue using INMAGIC with constituent colleges. These four witnessed Inmagic implementation. However, two of them reported that Inmagic implementation would have been more successful if the library team got involved in its acquisition, they also lacked expertise and vendor support and this hindered its full implementation.

While all the 15 admitted knowing about KOHA only 10 (n=15) admitted that KOHA failed. The ten said it was in between the process of KOHA implementation when they realized that the system was a failure and thus would not serve the intended purpose. They said the library had already incurred expenses in purchasing KOHA and that they had as well trained their staff and by the time they realized KOHA shortcomings, cataloguing module had been effected. Five of the respondents said KOHA implementation did not fail as it failed the test of CUEA library specifications/qualifications. They said KOHA weaknesses were noted while in the early stages of implementation process.

Of the 10 (n=10) respondents who indicated that KOHA implementation failed said that KOHA lacked proper feasibility study. They also cited KOHA failure to integrate with emerging technologies such as RFID hence stopping its implementation process midway.

**Table: 4.6 Reasons for INMAGIC and KOHA Failure**

System Name	Problems/challenges faced
INMAGIC	<ul style="list-style-type: none"> <li>• Lack of structured approach in system implementation process</li> <li>• Limited support from CUEA university top management</li> <li>• Failure to consult and involve library staff</li> <li>• Lack of adequate expertise in Information Technology Systems</li> <li>• Lacked of Vendor support</li> <li>• Poor ICT infrastructure</li> <li>• Inadequate funding</li> </ul>
KOHA	<ul style="list-style-type: none"> <li>• Lacked proper visibility study</li> <li>• Failure to integrate with RFID</li> </ul>

It is evident that previous systems implementation at CUEA library were faced with several problems

#### **4.6.2 Challenges Facing V-Smart Implementation**

The study sought to obtain some information from two groups of users first six senior staff and other category of library staff and users concerning challenges that affected V-smart implementation.

##### **Challenges facing Library Senior Staff in V- Smart Implementation**

The six senior staff indicated that they encountered several problems:

- **System Maintenance and Sustainability Cost**

Three (n=6) of the respondents reported that V- Smart implementation has turned out to be more expensive in terms of maintenance and sustainability. That the vendors had other hidden charges not previously disclosed and every time the library wanted to add on a new function to the V-smart they were charged extra fee.

- **Vendor Support**

Four (n= 6) reported that their communication with the vendor is not as easy at present when compared to as when they were buying the system. They said it was time consuming with long waiting period for vendor's responses. As expressed by one of the respondents, "..... Our system vendors are not as reliable as they were before....it takes so long for them to give feedback to such a point I get frustrated".

- **Change of Plans**

All the six (n=6) respondents reported that plans were changed in between the implementation period. Initially the library was to implement KOHA but this was changed later when KOHA shortcomings were noted in between its implementation. Timeframe of system implementation also changed and this made the library to race against time as they rushed to implement V-SMART to beat moving to their new modern building.

- **Achieving Consensus among Stakeholder**

Three (n=6) of the respondents reported that, KOHA implementation was faced with problems which made the library to rapidly change to V-smart. This almost resulted into misunderstanding between the stakeholders (library and the University management) as KOHA had eaten into part of the library system implementation budget. The library had to justify their action.

- **System Implementation Resistance**

All the library senior staff reported that V-smart implementation was faced with less resistance.

### **Challenges experienced by other Library Staff and Users in the Implementation of V-Smart System**

In addition the study sought to find out other problems experienced by library staff and users in regard to V- smart implementation. This question was addressed to 11 library staff and 50 library users a total of 61 respondents.

51 (n=61) of library staff and users interviewed experienced slow network connectivity, 15 had problems with passwords, security challenges were cited by 15 library staff, those who were challenged by the complexity of the user interface were 12, 5 cited power interruptions, 5 cited data conversion challenges, while 3 Said vendor support is not 100%, while 2 cited library user resistance on the system, 2 cited poor handling of change management, 3 cited inadequate ICT skills and getting the right people for the job, and 10 cited inadequate training. A summary of these challenges are presented in table 4.9

**Table 4.7: Challenges in Implementing Automated Systems**

<b>Problems</b>
✓ slow network connectivity
✓ Password problems
✓ Security challenges/not theft proof
✓ System interface complexity
✓ Inadequate training
✓ Power interruptions
✓ Data conversion
✓ ICT skills –getting right people on board
✓ Vendor support
✓ Poor handling of change management
✓ System user resistance



Apart from what is listed in table 4.9 above, the study also established that network delays due to limited bandwidth and power interruptions attributed to the use of dry battery were a common place.

- **Training**

They said they were only trained on those modules they interacted with as per their job specifications and explained on the need to learn other modules of V- smart rather than their areas of specialization. They argued based on “job rotation principle’ that one can be called to sit in for their colleague yet they have only mastered their modules. Library staff said their training tutorials came from UK and felt they needed one of their own to carry them through the training in a simple language. They felt the training timetable was too busy that they attended too much training within a short period of time and this affected their V-smart memory. Library staff also cited large number of library users that needed training as a challenge. One of the library staff said, R7... *“It was not easy training such large number of users to master the system language”*

- **System User Resistance**

The library staff reported that it was difficult buying the trust of library users in believing in the system. They reported that some library users still have issues with V-smart

- **Password Problem:**

Library staff and users reported that V- smart is self service/check system and sometimes users forget their passwords/codes. However library staff said they have provided users with master cards in cases of forgotten passwords but then users felt it was time consuming hence this discouraged them from using the system.

- **Power Interruptions**

Even though respondents reported that they had a power back-up, they felt it was not adequate enough to counter the challenges.

- **ICT Skills**

They said it was challenging to get the right person on board. They wanted an ICT specialist who understood V- smart.

- **Technical Issues/System Complexity**

Library users felt the system was too complex and admitted that severally they have had issues when serving themselves. They said they found it tiresome carrying around their library tags that is used to access the library.

- **Security Challenges/not Theft Proof**

Security systems cannot be 100%. Some library staff felt that magnetic strips were much efficient compared to RFID tags. They said RFID tags are too physical for library users to notice and pluck yet magnetic strips were more reliable.

Library users reported that library security staff relied too much on CCTV security screens and RFID systems and that some users were exiting with library materials in a dubious manner. They felt that library security needs to incorporate more of manual checks parallel to technology.

- **Data Conversion:**

Library staff said it was tasking as Inmagic was not MARC based hence this made data import difficult and thus all data had to be keyed in.

#### **4.7 Suggested Solutions to Challenges Faced in Automated Systems Implementation**

The sixth and last objective of this study was to establish possible solutions to problems faced by CUEA library in V- Smart implementation. This exempted other systems (INMAGIC and KOHA) considering V- Smart was the most recent in implementation at CUEA library. Respondents gave the following as possible solutions to the cited challenges in table 4.9.

- **Training**

Most interviewed library users said V-smart training need to be continuous for them to master its complexity. Library staff interviewed proposed one-on-one mode of training, group training in addition to V-Smart user manuals/tutorials. They felt they have to be trained on how to use other V- smart modules not related to their specialization. This would enable them to know how to serve users better in case of job rotation.

- **System Maintenance and Sustainability Cost**

Library staff felt the need to negotiate with V-smart vendors and get much cheaper rates.

- **Password**

Library users felt that access right should be checked and if possible enable intranet to bypass the password. They felt that they were wasting much of their time trying to remember passwords and getting the master card available at their service.

- **Vendor Support**

CUEA library staff felt the need to have V-smart consultants made locally available and if possible be provided with an office within the CUEA library. They also felt the need to have

CUEA System Librarian well trained on issues regarding V-smart such that he is able to trouble shoot incase of system emergencies.

- **Resistance**

The respondents who pointed out this challenge, two cited continuous communication as a means of reducing resistance while 4 cited user involvement in the entire change process. Library staff felt that proper and effective system implementation is about communication and user involvement

- **Security**

The library users felt that the library security team need not over rely on the system. They said the security guards need to do searches every time a user leaves the library with materials. Library staff felt that the RFID system is not as efficient as magnetic strips. They suggested and preferred use of magnetic strips rather than RFID as they had noted how students easily plucked RFID tags.

The library staff felt security guards need to have a closer supervision by the library staff. They argued that just like all other library departments such as cataloguing, circulation, serial, acquisition, reference and ICT had librarian staff allocated to head, security as well needed to be a department

In agreement with CUEA library users Pandian, (2010) assert that, though RFID makes implementing security measures easier when compared to electromagnetic tags there are issues that undermine this benefit. Depending on the strength of a RFID reader it is possible to either greatly hinder or completely block the tag signal by wrapping an item, embedded with a RFID tag, with several layers of aluminum or tin foil. This, combined

with the not always so well performing gate sensors, makes risk of items getting stolen quite high. Also if the RFID tags are not embedded inside the book covers it is easy to just remove them (the tags).

#### **4.8 Chapter Summary**

From the data analysis, it is evident that being in a position to afford and purchasing an automated library system such as V-smart and having it integrated with other technologies as RFID is not an assurance that implementation process will be effective. Other factors in system implementation like reducing user resistance, training, creating awareness, user involvement, user participation and communication, among other strategies/approaches, have to be taken into considerations.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter gives the summary of the main findings of the study and makes several recommendations which address key success factors that were found to be critical in automated system implementation at CUEA library. The summary is provided in reference to the aim, objectives, research questions and the assumptions of the study. The research findings are briefly discussed to offer an overview of the major revelations. Conclusions and recommendations of the study are also presented in this chapter as well as suggestions for further research.

This study set out to investigate change management approaches in the implementation of automated Information System in CUEA Library with a view of providing recommendations for successful implementation. It examined use and application of automated systems at CUEA library, factors that necessitated need for automated system change, approaches used in automated system implementation at CUEA library, the responses of CUEA library staff and users towards automated library systems in library operations and services, challenges experienced in the implementation of automated library system in CUEA library and solutions to the challenges hindering successful automated system implementation at CUEA library.

## **5.1 Summary of the Findings**

The research was guided by six research questions whose answers form the basis of the findings of this study as summarized below:

### **5.1.1 How Automated Systems are used in Support Of CUEA Library Operations and Services**

The study established that even though the library was automated since 1999 using INMAGIC system, only Cataloguing processes and OPAC were automated. All the other library operations such as circulation among others remained manual implying that CUEA library did not benefit fully from INMAGIC adoption. It was established that (section 4.3) while a few of the users used INMAGIC for cataloguing processes and OPAC only, majority used it for searching OPAC while using the manual system in their circulation processes (borrowing and returning ).

KOHA on the other hand was only confined to cataloguing process only as it was used for in-house cataloguing process only (KOHA implementation never went live to other operations). Of the respondents, only one of the library staff found Koha running parallel INMAGIC but even then opted to use INMAGIC for cataloguing and OPAC section.

The study further established that even though library staff and users used the V- Smart system, the purpose/ function for use differed from one user group to the other. 15(n=67) library staff used the system in performance most of the core library functions including cataloguing, circulation, serial, and reference, with the exception of V-smart acquisition module/function which at the time of the study had yet to be implemented. Majority of the library users, 52(n=67), used V-smart for self checking (borrowing and returning),

electronic payment of fines using ATMs, luggage storage at the library luggage area. All the 67 (library staff and users) used the system for OPAC search and library access. No single library user used V-smart to check his/her reading history.

It is evident that the extent of implementation of the systems varied from one to the other, majority of which were highly underutilized. Of all the three, V-Smart implementation was the most successful considering that all its functional modules except acquisition had been implemented, while the acquisition module was in the process of implementation at the time of data collection. These findings render supports to Reddy (2001) who observed that, the basic components of an integrated library system are the cataloguing module, the OPAC and the circulation module. Other modules which may be present are: Serials management and Acquisitions module. This is also supported by Singh (2003), who observes that, the circulation system is the transaction module that allows the system to loan out and receive returned materials. The transactions are automatically linked to the cataloguing module to enable users to find out if materials are available for loan or have been borrowed. Overall, the library stands to benefit more from the full implementation of V-Smart.

### **5.1.2 Factors that Led to Change of CUEA Library Systems**

The study established that a total most library staff and users had problems with previous systems (INMAGIC and KOHA) (**section 4.4**). That INMAGIC was limited to cataloguing and OPAC functions only while KOHA was only used for cataloguing implying that all other functions remained manual. Findings indicated that the Brown system (manual system) was vulnerable to human error as evidenced by poor circulation records management, overcharging of fines, and time wastage in service provision



amongst others. INMAGIC on the other hand was incapable to relate to any existing standards such as MARC format and as well failed to integrate with RFID technology. INMAGIC was also considered to be a complex standalone system lacking multiple accesses application and incapable of integration therefore compromising on operational excellence (**section 4.4**). These findings collaborate with Singh (2003) who observed that, library interest in automated circulation control is, in large part, based on a long-standing awareness of the problems inherent in manual circulation systems. These problems include labor-intensive and time-consuming recordkeeping work routines, inaccuracy, high personnel turnover, inability to generate statistics about circulation activity, and lack of an interface between circulation files and other library files which contain much the same bibliographic data.

Based on the above issues, the study established that there were a number of underlying reasons that forced CUEA library to consider migrating from INMAGIC to KOHA then to V-SMART. Among the reasons, systems functionality is key reason as to why the library migrated. INMAGIC had been used for ten years and the library staff and users were generally not happy with its performance when the decision was reached to change to KOHA, whose implementation failed in between the process. . While KOHA was generally considered to be functional, it lacked innovation and efficiency as such the library had to migrate to V- SMART. Reasons cited for the migration from KOHA to V-SMART included the need to conform to the expectations of the modern building; technological advancements; V- SMART's capability of being integrated with other technologies such as RFID; and its comparative ease of use. The fact that INMAGIC was considered to have been imposed to the library as the library management team was not

involved in its acquisition, could also have contributed to its ultimate rejection (**section 4.4.1**).

### **5.1.3 Implementation of the Current and Past Systems**

Unlike INMAGIC implementation, the study established that KOHA and V- SMART systems were implemented gradually in phases with cataloguing and OPAC being the first modules to be implemented. It was at the cataloguing implementation phase that KOHA shortcomings were noted and decisions to migrate to V-SMART were made. In V- SMART implementation, Cataloguing module implementation was followed by circulation, reference and lastly serial management. This offered CUEA library a gradual change to the overall new system during which library staff gained experience and confidence (**section 4.5.1**). Despite this, it was reported that at the time of implementation of V-SMART around December, 2012, CUEA library run the three systems (INMAGIC, KOHA and V-SMART) parallel implying that as the new system(V-SMART) went live, both INMAGIC and KOHA were kept running. The three systems therefore ran side by side and all the three were used in cataloguing and eventually KOHA and INMAGIC left to a natural slow death as stated by one library (**section 4.5.1**).

Williams and Sawyer (2007) note that change over can be described as the take on- phase to the new system and it should be planned and effected at the most suitable time for a smooth transition to the new system. They further list the following as common approaches of change-over: Pilot running, phased, direct change over and parallel-running. CUEA library in this case, used both phased and parallel running in their system

implementation. The study also established that CUEA library used the following change management approaches in the implementation of V-Smart:

### **User Involvement**

The study established that V-SMART was a library initiative and thus all the CUEA Library staffs were involved in its implementation (**section 4.5.1**). The library team was involved in planning and implementation committee, led by a change and team leader in the entire process. This helped in overcoming resistance and gaining staff commitment in the implementation process. End user involvement in the development of new information systems is considered as a key to solving problems of end user resistance to new information technologies (Gotsill & Meryl 2007). User participation reduces uncertainty and leads to commitment. Library staffs involved in automation change are in a better position to understand the need for change and are motivated to support the change thus less likely to resist it. All the 52 library users were also trained on how to use the system even though they were not involved in giving any suggestions.

Burke (2001) points out that, coordination between departments may become increasingly important during times of change; for instance, in libraries the introduction of new technology may necessitate greater collaboration between IT departments and reference, circulation, or other services. CUEA library involved the ICT department in the V-smart implementation.

### **Communication**

The study established that the library top management communicated its intentions and goals to users through: meetings, emails, notice boards, websites, workshops, Facebook

and student's representatives and an open door policy which gives the users an avenue to make their suggestions and complains.

Success in the implementation of the V- SMART was significantly attributed to good communication in the entire stages of its implementation (**section 4.5.1**) unlike in previous systems such as INMAGIC. Emphasizing on the role of communication in systems implementation, Burke (2001) advocates for staff to be kept informed of the progress of the implementation process in order to avoid feelings of alienation and powerlessness over the change process. He further argues that, given automated system environment, effective communication with staff regarding change is essential to the success of libraries and other information systems implementation. Automation change should be communicated in a way that staff will see it as a positive thing for both the library and themselves. If employees are informed about the need for change they will be more likely to help with its implementation. Thus, effective communication helps manage expectations of users and create awareness and understanding of the impacts and implications of any new system. Such communication during change process should however be continuous and consistence as communication breakdown can act as an obstacle to successful change implementation.

### **User Awareness and Familiarity with the System**

The findings established that generally the CUEA library users were kept informed of the systems as they were implemented albeit the number (hence level of awareness), varied from one system to the other. From the list of library databases the university library had adopted, V-SMART topped the list of level of user awareness, followed by INMAGIC

then KOHA (**section 4.5.1**), the reason for low knowledge of KOHA existence was based on the fact that KOHA never went live to library users. It remained internally used by CUEA library staff.

Amongst the channels used in promoting awareness amongst the user included: Library visits, CUEA website, library face book, notice boards, Library orientations and user education. In the case of V-smart, word of mouth by library staff was found to have been particularly useful in spreading information about the system (**section 4.5.1**) underscoring the significant role of human and personal contact in creating awareness among users which in-turn sets the first step towards the appreciation or rejection of a system.

#### **University Support:**

CUEA library lobbied for entire university support (**section 4.5.1**). The entire university top management walked with the library throughout V-Smart implementation. They also involved ICT department in V-smart implementation. The ICT department offered advisory services on systems evaluation and user requirement assessment. In addition to top university management talking much about the system hence promoting awareness, awareness, they also provided the library with moral and financial support, as well as healthy criticism as in the case of KOHA failure. The identified failures noted and avoided in the subsequent system implementation (V-SMART)system.

#### **Training**

The study established that CUEA library provided training to its staff and users V- Smart training was provided through library orientations, user education, one-on-one training, on the job training and continuous practice (**section4.5.1**)

In the case of V- Smart, its vendors were also involved in the training of library staff. However, the findings also established that in most of the cases, the library staff level of competency in the systems use was confined to their immediate functional areas of service. It was evidently clear that not every staff was given detailed training on the whole system but training was limited to their departments of work. Those in reference department had limited knowledge of circulation and cataloguing modules and vice versa. Although Sykes (1991) is opined that automation training must emphasize jobs and purposes, the staff expressed their dissatisfaction with the confined module approach of training and proposed familiarization to the total systems functionality approach instead.

#### **Promotion of user Readiness and Willingness for Change**

Getting people ready for change is one of the best strategies outlined in Lewin (1946) and Kotler (1996) models of change. The study established that CUEA library staff was ready and well prepared for change of INMAGIC to V-SMART. Most of the users considered V-SMART implementation long overdue and reported that they were unhappy with the performance of the manual system and the confusion and inconveniences associated with it (**section 4.5.1**)

#### **Use of a Structured Implementation Approach**

Unlike with INMAGIC implementation, the study established that CUEA library carefully followed system implementation approach with V- SMART. This included problem identification, system design; system testing and training of staff.

The initial phase included a feasibility study which included analysis of reasons for INMAGIC failure, visits to University of Nairobi which was using an older version of V-

SMART for facts finding, to share and get ideas on V-Smart weaknesses and strengths and wide consultation and sharing of ideas. In the implementation phase, a pilot running method was employed where modules were introduced at different time intervals as well as parallel running of the other older systems thus allowing for a smoother transition.

### **Employment of an ICT System Librarian**

Unlike with INMAGIC and KOHA implementation, the study established that CUEA library employed an ICT/Systems Librarian with an ICT professional background.

### **Leadership and Team work**

The study established that leadership and team work was critical in V-SMART implementation and the library had build commitment through teams. V-SMART implementation process was attributed to team work. The library had set groups which had been assigned different roles such as cataloguing, data entry for borrowers and other circulation details.

The significance of team leaders was underscored as successful implementation and the library had therefore established change and team leaders. Leadership was critical in the entire process and that they had team leaders and change leaders. This worked in making V-SMART implementation a success.

#### **5.1.4 Perception and Attitudes of Library Staff and Users towards Automated Library Systems**

Rosen and Weil (2000) explored human reactions to the introduction of additional technologies into the home and workplace. In their research they found that, although there are people who are genuinely excited by new technology and enjoy using it, there

are a substantial number who are resistant to technology. V-smart implementation received less resistance and the library users were excited about the system and were ready to learn more about it. Words such as “excellent”, “it is the best”, “enthusiasm”, “eager to learn” and “excited”, recurred frequently in staff and user’s response to the system. The respondents appreciated the change particularly with the self check off system as it saved on their time and improved on the efficiency of the service. Despite the near conflict between the university management and the library over the rapid systems turnover, systems, overall, the management’s good will was demonstrated by their commitment in the library budget allocation and autonomy given to the library to make decisions (**section4.6**).

#### **5.1.5 Factors Negating Successful System Implementation**

Different sets of factors were found to impede on the success of the systems implementation. Collectively they included slow network connectivity resulting from low bandwidth therefore frequent internet connectivity interruptions, passwords problems, complexity of the user interface, power interruptions, , data conversion challenges, library material security challenges, inadequate vendor support, system maintenance and non-disclosure of all costs by vendor up front, , library user resistance , poor handling of change management, Changes in the implementation timeframe, inadequate ICT skills and getting the right people for the job and inadequate training. Library staff also cited large number of library users that needed training as a challenge. One of the library staff said “it was not easy training such large number of users to master the system language”

These factors are listed in the table 5.1.



**Table 5.1 Factors Negating Successful System Implementation**

<b>Factors negating successful system implementation</b>	<b>Brief explanation</b>
slow network connectivity	<ul style="list-style-type: none"> <li>• low bandwidth and therefore frequent internet connectivity interruptions</li> </ul>
passwords problems	<ul style="list-style-type: none"> <li>• Difficulty by users to remember the passwords/codes of the self check V-smart system.</li> <li>• Master cards provided in cases of forgotten passwords were found to be time consuming</li> </ul>
Security challenges	<ul style="list-style-type: none"> <li>• Security systems cannot be 100%. Some library staff felt that magnetic strips were much efficient compared to RFID tags. They reported that RFID tags are too physical for library users to notice and pluck yet magnetic strips were more reliable.</li> <li>• Library users reported that library security staff relied too much on CCTV security screens and RFID systems and that some users were exiting with library materials in a dubious manner.</li> <li>• They felt that library security needed to incorporate more of manual checks parallel to technology.</li> </ul>
Complexity of the user interface	<ul style="list-style-type: none"> <li>• System was too complex and admitted having had challenges when serving themselves.</li> <li>• they found it tiresome carrying around their library tags that are used to access the library</li> </ul>
Inadequate training.	<ul style="list-style-type: none"> <li>• Busy training time table resulting to the attending too much training within a short period hence affecting their V-SMART knowledge memory.</li> <li>• Not easy to train large number of library users to master the system language.</li> </ul>
Power Interruptions	<ul style="list-style-type: none"> <li>• power back up inadequate to counter the interruptions</li> </ul>
Data conversion challenges	<ul style="list-style-type: none"> <li>• Data conversion was tasking as INMAGIC was not MARC based hence this made data import difficult and thus all data had to be keyed in manually.</li> </ul>
Inadequate ICT skills	<ul style="list-style-type: none"> <li>• Was challenging to get the right person on board. They wanted an ICT specialist who understood V-smart</li> </ul>
Inadequate vendor support	<ul style="list-style-type: none"> <li>• communication with the vendor is not as easy as like when they were buying the system</li> <li>• Time consuming waiting for vendor response whenever they had something to consult.</li> </ul>

Poor handling of change management,	<ul style="list-style-type: none"> <li>• Not everybody was involved in the implementation process.</li> </ul>
System user resistance	<ul style="list-style-type: none"> <li>• It was difficult buying the trust of library users in believing in the system. They said some library users still have issues with V-smart</li> </ul>
System maintenance and non-disclosure of all costs by vendor up front	<ul style="list-style-type: none"> <li>• V- Smart implementation turned out to be more expensive in terms of maintenance and sustainability.</li> <li>• V-SMART vendors had other hidden charges and every time the library wanted to add on V-Smart they were charged extra fee.</li> </ul>

Slow network connectivity resulting from low bandwidth and power interruptions due to use of dry batteries are common place problems.

### 5.1.6 Summary on Proposed Solutions

Respondents gave the following as possible solutions to the cited challenges in table 5.1

**Table 5.2 Summary on Proposed Solutions**

Challenges	Proposed Solutions
Training	Most interviewed library users said V-smart training need to be continuous for them to master its complexity. Library staff interviewed proposed one-on-one mode of training, group training in addition to V-Smart user manuals/tutorials. They felt they have to be trained on how to use other V- smart modules not related to their specialization. This would enable them to know how to serve users better in case of job rotation.
System maintenance and sustainability cost	Library staff felt the need to negotiate with V-smart vendors and get much cheaper rates
Password	Access right should be revised and if possible enable intranet to bypass the password.
Vendor support	need to have V-smart consultants made locally available and if possible be provided with an office within the CUEA library. They also felt the need to have CUEA System Librarian well trained on issues regarding V-smart such that he is able to trouble shoot incase of system emergencies

Resistance	Continuous communication and user involvement as a means of reducing resistance in the entire change process.
Security	<p>Library security team need not over rely on the system. the security guards need to do searches every time a user leaves the library with materials.</p> <p>The RFID system is not as efficient as magnetic strips. They suggested and preferred use of magnetic strips rather than RFID as they had noted how students easily plucked RFID tags.</p> <p>Library staff felt security guards need to have a closer supervision by the library staff. They argued that just like all other library departments such as cataloguing, circulation, serial, acquisition, reference and ICT had librarian staff allocated to head, security as well needed</p>

## 5.2 Conclusions

This study set out to analyze change management strategies in the implementation of automated systems at CUEA library. It was based on the assumption that frequent change of automated library information systems at CUEA library could be attributed to poor change management strategies.

The research investigated use and application of automated systems, reasons for change of automated systems, user attitudes towards change of automated systems, pertinent problems affecting implementation of automation projects, and possible solutions to these problems. Based on the study findings and the forgoing presentation, the study draws the following conclusions:

### **5.2.1 Use and Application of Automated Library Systems**

Efforts at automation of library services in CUEA Library can be traced back to the year 1999. Despite this, no concerted efforts were directed towards seeing to automation becoming a fully fledged reality. This is attributed to the non-involvement of the library staff in the selection and purchase of the system and the inadequate feasibility studies conducted. As such, operations of INMAGIC software, the first functioning system, remained limited to cataloguing and OPAC functions. This system was only usable on a standalone machine platform making it difficult for multitasking and multi- user access. All the other library functions such as circulation amongst others remained manual using brown system which users attributed to having document transaction problems.

From the findings, it can be concluded that having automated systems in place is not an assurance that library staff and users will be in a position to effectively using the system. Other implementation factors like user involvement and participation in the selection and purchase of the system as well as carrying out adequate feasibility studies amongst others have to be put into consideration.

The study established that even though library staff and users used the V- Smart system, the purpose/ function for use differed from one user group to the other. Library staff used the system in performance of all library functions as per their library departments (cataloguing, circulation, serial, reference). It was established that V-smart acquisition module/function was yet to be implemented at CUEA library.

While library users used V-smart for self checking (borrowing and returning), electronic payment of fines using ATMs, all the 67 (library staff and users) used the system for luggage storage at the library luggage area, OPAC search and Security/library access.

From this, it can be concluded that V- Smart implementation is more a success compared to the previous systems (Inmagic and Koha). For system implementation to be a success all operational modules need to be implemented and put into use as it is the case with V-smart at CUEA.

This is because an Integrated Library System (ILS) is system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed. According to Wikipedia (n.d.b) “An ILS usually comprises a relational database, software to interact with that database, and two graphical user interfaces (one for patrons, one for staff). Most ILSs separate software functions into discrete programs called modules, each of them integrated with a unified interface. Examples of modules include:

- acquisitions (ordering, receiving, and invoicing materials)
- cataloging (classifying and indexing materials)
- circulation (lending materials to patrons and receiving them back)
- serials (tracking magazine and newspaper holdings)
- the OPAC (public interface for users)

Each patron and item has a unique ID in the database that allows the ILS to track its activity”.

With exception of acquisition module, CUEA library has achieved all the above with V-smart implementation. Balnaves (2008) observed that during the last decade there has been significant innovation in Integrated Library Management Systems (ILMS). Integrated Library Systems (ILS) have evolved to extend functionality from acquisition and circulation control to a range of other features integral to library operation, and to meet increasing demands for complementary functions, such as integration with security management systems. The V- Smart system at CUEA library has been implemented in integration with RFID system which helps in ensuring security of library resources as it controls access.

### **5.2.2 Reasons for Change Of Automated Library Systems**

The study established that CUEA library had a number of reasons as to why the library systems were changed. Among the reasons: INMAGIC was limited to cataloguing processes and OPAC only implying that all the other functions remained manual; it operated as a standalone and hence could not allow for multifunction; it lacked vendor support; library users demanded for improved services; and it was difficult integrating with other technologies.

In spite of these findings, it was however established that the rapid technological changes and the need to be on the cutting edge of technology pushed the library to changing its system from Inmagic to Koha. However, Koha implementation failed on realization that it was not compatible with other technologies such as RFID.

Müller (2011) observes that integrated library systems (ILS) are multifunction, adaptable software applications that allow libraries to manage, catalog and circulate their materials to patrons. He also suggests that “in choosing ILS software, libraries must base their

decision not only on the performance and efficiency of the system, but also on its fundamental flexibility to readily adapt to the future demands and needs of their patrons”.

From these data analysis, it is evident that, systems migration is a fact of life in the library world for various reasons. For instance, Integrated Library System (ILS) vendors may change development strategies, or they might acquire or merge with other companies, thus discontinuing support of some products. And, in progressive libraries, the time inevitably comes when the current automated system is no longer powerful enough or fast enough. One of the more recent challenges spurring ILS upgrades comes when patrons find new functionality on other Web sites and then expect to search library sites in the same fashion.

Outdated hardware platforms and operating systems will also drive migrations. As Breeding and Roddy (2003) assert, whatever the reason, system migration is always a complex project, as it affects all library services. Staff members from all departments need to be involved. The migration process entails the following stages: system selection, implementation planning, system profiling, data conversion, training, and publicity.

### **5.2.3 Implementation of the Current and Past Systems**

The approach towards KOHA and V-SMART implementation was structured and systematic. The study established that migration from Inmagic to KOHA then V-SMART was gradually in phases (bit by bit), with cataloguing and OPAC being the first followed by circulation, reference and serial management. This offered CUEA library a gradual change to the overall new system during which library staff gained experience and confidence.

However, the study established that CUEA library ran the three systems (INMAGIC, KOHA and V-SMART) parallel implying that the new system (V-smart) went live but Inmagic and KOHA were left running for some time. The three systems therefore run side by side and all the three were used in cataloguing.

The study established that unlike with Inmagic implementation, CUEA library used the following change management approach in the implementation process of V-SMART:

**a) User Involvement**

User involvement is paramount to making a system implementation successful. End user support is essential and measures should be made to gain this and one of the most effective methods is to give the end users direct involvement in the systems development and implementation

The study established that V-SMART was a library initiative and thus all the CUEA Library staff was involved in its implementation. The library team was involved in planning and implementation committee, led by a change and team leader in the entire process. This helped in overcoming resistance and gaining staff commitment in the implementation process. End user involvement in the development of new information systems is considered as a key to solving problems of end user resistance to new information technologies. User participation reduces uncertainty and leads to commitment.

Library staffs involved in automation change are in a better position to understand the need for change and are motivated to support the change thus less likely to resist it. All



the 52 library users were also trained on how to use the system even though they were not involved in giving any suggestions.

### **b) Communication**

Effective communication is critical to automated systems implementation. Expectations at every level need to be communicated. User input should be managed in acquiring their requirements, comments, reactions and approval.

The study established that the library top management communicated its intentions and goals to users through: meetings, emails, notice boards, websites, workshops, Facebook and students' representatives and an open door policy which gives the users an avenue to make their suggestions and complains.

Success in the implementation of the V- SMART was significantly attributed to good communication in the entire stages of its implementation unlike in previous systems such as INMAGIC. Emphasizing on the role of communication in systems implementation, the research advocates for staff to be kept informed of the progress of the implementation process in order to avoid feelings of alienation and powerlessness over the change process.

### **c) User Awareness and Familiarity with the System**

The findings established that generally the CUEA library users were kept informed of the systems as they were implemented albeit the number (hence level of awareness), varied from one system to the other. From the list of library databases the university library had adopted, V-SMART topped the list of level of user awareness, followed by INMAGIC then KOHA, the reason for low knowledge of KOHA existence was based on the fact that

KOHA never went live to library users. It remained internally used by CUEA library staff.

Amongst the channels used in promoting awareness amongst the user included: Library visits, CUEA website, library face book, notice boards, Library orientations and user education. In the case of V-smart, word of mouth by library staff was found to have been particularly useful in spreading information about the system underscoring the significant role of human and personal contact in creating awareness among users which in-turn sets the first step towards the appreciation or rejection of a system.

**d) University Support:**

Top management support is needed throughout the implementation as the project must receive approval from top management. CUEA library lobbied for entire university support. The university top management identified library system implementation project as a top priority.

The entire university top management walked with the library throughout V-Smart implementation. They also involved ICT department in V-smart implementation. The ICT department offered advisory services on systems evaluation and user requirement assessment. In addition to top university management talking much about the system hence promoting awareness, awareness, they also provided the library with moral and financial support, as well as healthy criticism as in the case of KOHA failure. The identified failures noted and avoided in the subsequent system implementation (V-SMART) system.

**e) Training**

CUEA library provided training to its staff and users V- Smart training was provided through library orientations, user education, one-on-one training, on the job training and continuous practice.

In the case of V- Smart, its vendors were also involved in the training of library staff. However, the findings also established that in most of the cases, the library staff level of competency in the systems use was confined to their immediate functional areas of service. It was evidently clear that not every staff was given detailed training on the whole system but training was limited to their departments of work.

Those in reference department had limited knowledge of circulation and cataloguing modules and vice versa. Although Sykes (1991) is opined that automation training must emphasize jobs and purposes, the staff expressed their dissatisfaction with the confined module approach of training and proposed familiarization to the total systems functionality approach instead.

**f) Promotion of User Readiness and Willingness for Change**

Getting people ready for change is one of the best strategies of change management. CUEA library staff was ready and well prepared for change of INMAGIC to V-SMART. Most of the users considered V-SMART implementation long overdue and reported that they were unhappy with the performance of the manual system and the confusion and inconveniences associated with it.

### **g) Use of a Structured Implementation Approach**

Unlike with INMAGIC implementation, the study established that CUEA library carefully followed system implementation approach with V- SMART. This included problem identification, system design; system testing and training of staff.

The initial phase included a feasibility study which included analysis of reasons for INMAGIC failure, visits to University of Nairobi which was using an older version of V- SMART for facts finding, to share and get ideas on V-Smart weaknesses and strengths and wide consultation and sharing of ideas. In the implementation phase, a pilot running method was employed where modules were introduced at different time intervals as well as parallel running of the other older systems thus allowing for a smoother transition.

### **h) Employment of an ICT system Librarian**

Unlike with INMAGIC and KOHA implementation, the study established that CUEA library employed an ICT/Systems Librarian with an ICT professional background.

### **i) Leadership and Team Work**

The study established that leadership and team work was critical in V-SMART implementation and the library had build commitment through teams. V-SMART implementation process was attributed to team work. The library had set groups which had been assigned different roles such as cataloguing, data entry for borrowers and other circulation details.

The significance of team leaders was underscored as successful implementation and the library had therefore established change and team leaders. Leadership was critical in the

entire process and that they had team leaders and change leaders. This worked in making V-SMART implementation a success

In conclusion all critical success factors in automated system implementation and change management such as technical expertise, user involvement, communications, management support and project team leadership were factored in V-smart implementation. The research observed that the library also factored in infrastructure support as a critical success factor in V-Smart implementation. This is attributed to a number of functions the system supported.

#### **5.2.4 Responses of Staff and users towards Automated Library Systems and Subsequently Library Operations and Services**

The study established that V-smart implementation received less resistance. all the 67 interviewed were positive of the library ICT system. Words such as “excellent”, “it is the best”, “enthusiasm”, “eager to learn” and “excited”, recurred frequently in their descriptions of staff and user response to the system.

It found that all the respondents appreciated the change and especially the self check off system as it saved on their time and improved on their services. They said it was long overdue. Positive attitudes are fundamental in the acceptance, implementation and success of new technologies.

Although majority of the users were genuinely excited by new technology and enjoyed using it, there were a substantial number who were resistant to technology. The research finds this acceptable as Change generally can bring both uncertainty and discomfort into

our lives. It may provoke strong emotional reactions in people ranging from the confusion, fear of being left behind or being replaced by others who have relevant technology skills and stress. Human fears of technology may emerge because its introduction, or increase in use, appears to threaten the *status quo*. Automated Information Systems (IS) implementation processes are not easy to achieve. The study established that V-smart implementation was faced with several challenges:

**a) Slow Network Connectivity**

The study findings indicated that library staff and users interviewed experienced slow network connectivity. The study also established that network delays are commonplace, especially when many users are trying to access the system due to low bandwidth.

As such the research recommends that bandwidth management should be incorporated into the CUEA library objectives. CUEA library should operate at bandwidth capacity in megabits and gigabits rather than kilobits. As well CUEA management should recognize the issue of bandwidth problem in Internet speed reception.

This will help in making strategic decisions in Internet connectivity in the university. Coupled with this, the university management should try to implement their ICT policies in order to enhance Internet connectivity.

ICT requires money for acquisition, installation, maintenance, training, and sustainability. Many university libraries in Kenya do not have adequate budgets/ funds to venture and sustain ICT. However, the government of Kenya with an information technology mission statement as to make the country an ICT hub in Africa and a key player in the

information society by the year 2030 has not achieved this as at 2014. Government should therefore, have focused attention to ICT development and Internet connectivity in particular.

#### **b) Power Interruptions**

In addition to limited bandwidth, power interruptions also had problem as the luggage system uses dry battery and sometimes runs off. CUEA library has an alternative power supply (Backup).

However, users complained that it is not effective enough as it is not instant. As such this research strongly advises university libraries not to rely on the public power supply when planning and discharging the automation project. Alternative power supply should be incorporated into the foray of library automation. Cost analysis of power generating set, solar electronic generating system and power inverter or any other electric power alternative should be considered and inserted into the automation project plan. No library automation could succeed without proper and timely power supply and the present power state in CUEA library is in urgent need of an alternate power supply.

The research thus recommends that the university library plans to purchase an alternative power supply and more so a powerful instant power backup.

#### **c) Password Problems**

Library staff and users reported that V- smart is self service/check system and a time users forget their passwords/codes. However library staff said they provide users with master cards in cases of forgotten passwords but then users felt it was time consuming hence this discourages them from using the system. The research recommends that

library users be encouraged to master their passwords. The Library should also keep several password master cards (especially with circulation and luggage department) and ensure they are made readily available in times of need.

**d) Security Challenges/not Theft Proof**

Security systems cannot be 100%. A few library staff felt that magnetic strips were much efficient compared to RFID tags. They reported that RFID tags are too physical for library users to notice and pluck yet magnetic strips were more reliable. Library users reported that library security staff relied too much on CCTV security screens and RFID systems and that some users were exiting with library materials in a dubious manner. They felt that library security needed to incorporate more of manual checks parallel to technology. This research recommend that both electronic and manual security system should work together to ensure highest degree of library collection safety.

**e) Vendor Support**

A major factor in changes witnessed in CUEA library is vendor instability. Due to vendor instability CUEA library was not able to fully implement Inmagic. As such the library was made to change to new system Koha to V-smart. In spite of this finding, the study established that even with V-smart implementation, **CUEA** library communication with the vendor is not as easy as like when they were buying the system. They reported that it was time consuming waiting for vendor response whenever they had something to consult.



### **5.3 Recommendations**

Based on the findings of this study, the following recommendations are put forward to Improve on change management approaches in automated system implementation at CUEA library:

#### **5.3.1 Adoption of an Open Source System**

The study established that V-Smart system turned out to be expensive in terms of maintenance, sustainability and vendor support. . It is important to note that ICT systems have changed tremendously over the recent years with open source software's that can be bought or downloaded and customized to suit individual library needs. It is recommended that if any new change of library system is to be made from V-Smart, then the library should adopt an open source system that meets its needs.

#### **5.3.2 Diligent and Consultative Vendor Terms Assessment**

The study established that V- Smart implementation has turned out to be more expensive in terms of maintenance and sustainability. The vendors had other hidden charges not previously disclosed and every time the library wanted to add on a new function to the V-smart they were charged extra fee.

If the library does not find an open source software suitable to meeting its needs like the case with KOHA, it is recommended that vendor support and sincere advice is fundamental for any successful system implementation and maintenance. Many automated systems fail due to lack of vendor support. CUEA librarians should be careful and check on vendor credibility before getting into any commitment. Only libraries with

stable vendor support are able to fully integrate all the major library functions and proceed to further implementation and expansion of the system.

It is advisable that university librarian be careful when accepting vendor terms. System implementation agreements should be understood by both parties. The Librarian is also advised to vet the vendors and consult with other librarians to get information regarding their trust.

### **5.3.3 Knowledge Sharing**

This research also recommends sharing of ideas between University librarians. University of Nairobi shared much of V-Smart information with CUEA library. This information sharing helped CUEA library in making key decisions in V-smart selection, acquisition and implementation. University librarians should not see themselves as threats to each other. They have lots to share between each other.

University libraries that are just starting their automation projects need ideas from their counterparts who have reached advanced stage. They have a lot to learn so that they will not repeat the same mistake others have made. It will also afford them the advantage of making choices having considered various ideas from their colleagues. University libraries should also form consortiums where they consult on automated library systems. Create forums for them to share ideas and train their system librarians on trouble shooting.

### **5.3.4 Change Preparedness, User Participation and Involvement**

V- Smart implementation was less resisted. The library staff reported that it was difficult buying the trust of library users in believing in the system. This study recommends change preparedness as essential in reducing resistance. People need to be prepared for change. It is fundamental to let people see and understand that there is need for a new system. Fundamentally also is communicating reasons for wanting to change and allow those involved see sense in the reasons.

The study also recommends incorporating every member of staff in the library automation plan (staff/user involvement). CUEA library did not involve all their library staff in the automation project. It is evident from the findings that some staff were only involved in training exercise as trainees. Segregation of certain staff involvement in the automation project implementation should be discouraged totally.

Every member of staff should be made a stakeholder in the automation of university library. This will discourage them of becoming a saboteur to the whole exercise. They will start to feel involved and offer useful suggestions for improvement of the whole exercise.

### **5.3.5 Enhance Communication and User Awareness**

Gaining staff commitment through communication is also another way of reducing resistance. Some staff believe that allowing automation in their libraries will cost them their employment. Their minds should be disabused of this assumption through communication of what automation is and its purpose in the library.

Creating awareness among library users also helps reduce resistance. It is clear from these findings that CUEA library created awareness of its system through various ways such as orientation, social media (CUEA website and face book), notice boards, student /library ambassadors/representatives and university management talking about the system among others.

CUEA library users were aware of the library system name (V-Smart). Yet it may not be surprising that majority of the university library users in other universities have not been really carried along about the new developments in their libraries. This research recommends that libraries should improve in their creation of current awareness services for their clients so that they will be acquainted of these developments and make judicious use of the services there in.

### **5.3.6 Adoption of a Realistic Automation Project Plan**

The study established that some study respondents were not happy with the way change management was handled at CUEA during V-smart implementation. The study recommends that, in addition to preparing staff for change, communication, user involvement and participation, and training, the university library senior staff should develop a steady and realistic automation project plan.

Automation project plans in CUEA library are too long to be achievable. The projects are unrealistic in that their excellent performance is short-lived rather than long term as per their expected lifespan.

This research suggests a serious, steady but realistic and evaluative automation project plan that its implementation will be followed seriously. The terms in the plan should not be ambiguous. The plan should be all inclusive and incorporate other departments such as ICT though some sections may be given preference but that must be done considerately.

### **5.3.7 Enhanced Training**

CUEA library staff said it was challenging to get the right person on board. They wanted an ICT specialist who understood V- smart. This study recommends that system librarians at CUEA be sponsored for specialized trainings in the systems they manage. This will enable them troubleshoot in cases of problems.

Also this study recommends that the University focus on training all rounded ICT specialists. The new introduced School of Information Sciences at CUEA should focus on training system librarians on various systems in existence in our local universities as well as focusing on new emerging technologies.

The study also established that training was a challenge. Some of the library staff felt they needed to be taken through the whole process of training. They felt they needed to as well learn other modules of V- smart rather than their areas of specialization.

They argued based on “job rotation principle’ that one can be called to sit in for their colleague yet they have only mastered their modules. Library staff said their training tutors came from UK and felt they needed one of their own to carry them through the training in a simple language.

They felt the training timetable was too busy that they attended too much training within a short period of time and this affected their V-smart memory. Library staff also cited large number of library users that needed training as a challenge.

The need for staff training in computerized library applications cannot be overemphasized. The success of automation in the university library depends largely on the ability of staff to facilitate and implement the process. Proper, frequent, and regular in-house IT training is a necessity if the maximum benefit is to be gained from the automation of library services and, most importantly, if the operations of the automated systems are to be independent of any one librarian.

The need for organized training on all aspects of automation can be justified by the frequent minor system breakdowns or malfunctions that render the library systems inoperative unless the systems librarian is available. This research therefore, recommends regular in-service trainings for all library staff in CUEA. Firmness and compulsion must be inculcated in order to make the staff partake dutifully and diligently. It is advisable that library staff understand each module of the automated library system. This is fundamental in cases of job rotation as well as help library staff be able to serve in all library departments satisfactorily.

These trainings should form part of the prerequisites in recruiting and promoting of new and existing staff respectively. This will surely gear them towards the acquisition of computer based education which will in turn assist them in discharging their duties more professionally.

### **5.3.8 Proper Planning on Implementation Timeframe**

Initially the library had started on KOHA implementation when it noted its shortcomings. This made their timeframe change racing against their planned time. The study recommends proper planning in system implementation and execution.

### **5.3.9 System Maintenance**

It would be naive to think that a library would be able to run an efficient proprietary LIS without at least some of the library's budget allotted to prepare for mistakes, problems or maintenance. As such, the university librarian and the library committee should raise questions such as: is the library willing to allot overtime pay for creating new features? Is the library willing to commit further financial resources if the project grows larger than a single library? All of these questions must be considered in the planning phase but also in the budget. It is important that a library examine its budget and ask hard questions about whether or not they can afford to sustain this system.

This research also recommends proper funding through special budgeting system that will adequately cover their ICT financial commitments. CUEA library could also generate funds through internal charging system of the library users. This may be through payment for the use of internet, printing, registration and renewal of library's membership, reprographic services among others.

## **5.4 Considerations for Further Research**

Since this study focused on analysis of change management approaches in the implementation of automated library Information systems at CUEA library, there is need

for further research to determine if automated systems in university libraries in Kenya are delivering the benefits for which they were designed.

The study should focus on the management approaches in the implementation of automated library systems in university libraries in Kenya, reasons for university libraries changing LIS and challenges university libraries in Kenya face in LIS implementation and maintenance. This will help university managements in Kenya understand the hardships university libraries face in implementing and maintaining LIS and determine the success and future of LIS in university libraries in Kenya.



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## APPENDICES

### Appendix 1: Interview Guide to Top Management

I am a student at the school of information sciences, Moi University undertaking a Master of philosophy Degree in information sciences, majoring in library and information studies. I am carrying out a research study titled “**Change Management Strategies in the Implementation of Automated Library Information Systems at CUEA**”. The aim of the study will be to investigate change management strategies in the implementation of automated library system in CUEA library with a view of proposing a framework for successful implementation.

The researcher has chosen you as one of the respondents in the study. Kindly spare a few minutes to give your response to the following. Be as honest as possible in your answers. The information gathered will be treated with confidence, and be only be used for academic purposes.

#### **PART A: BACKGROUND INFORMATION**

1. Your designation/title.....
  
2. How long have you worked at CUEA library?  
.....
  
3. How long have you worked in the current position? .....
  
4. Which automated library Information Systems have you seen implemented during your stay at CUEA library?  
.....  
.....  
.....

#### **PART B: USE AND APPLICATION OF AUTOMATED LIBRARY SYSTEMS**

4. For what library operations were the past systems used and applied?  
.....  
.....

5. How is the current system being used and applied in the library operations/activities?

.....  
.....  
.....

**PART C: REASONS FOR CHANGE OF AUTOMATED INFORMATION SYSTEM**

6. What are the factors that necessitated CUEA library need to change its automated system from the past to the current one?

.....  
.....  
.....

**PART D: APPROACHES/PROCEDURES USED IN IMPLEMENTATION OF AUTOMATED LIBRARY SYSTEMS**

7. How do you understand the term change management?

.....  
.....  
.....  
.....

8. How was the new/current system introduced/effectuated?

.....  
.....  
.....

9. Were you involved in the implementation process?

YES
NO

10. If yes, what role did you play in the implementation process?

.....  
.....  
.....

11. If no, what reasons can you give?

.....  
.....  
.....

12. Are the library users familiar the new system?

YES
NO

13. If yes, how are library users and staff made familiar with a new system?

.....  
.....  
.....

14. In your opinion, do you think the implementation of the past automated system(s) failed?

YES
NO

15. If yes, why do you think they failed?

.....  
.....  
.....

16. What approaches or strategies did you use in the implementation of the new/current system?

.....  
.....  
.....

17. Was the ICT directorate part of the system implementation?

YES
NO

18. If yes, what role did they play in the implementation process?

.....  
 .....  
 .....

19. How does the library top management communicate its goals to the university community, library users and the library staff?

.....  
 .....  
 .....

#### **PART E: PERCEPTION AND ATTIDUES OF LIBRARY STAFF AND USERS**

20. What is the reaction of library staff and users towards automated library systems?

.....  
 .....  
 .....

21. How have the rapid changes of library automated system affected the University's perception of the new library system?

.....  
 .....  
 .....

22. Does the CUEA top management support the library in the implementation of automated new systems?

23. If yes how?

.....  
 .....  
 .....

#### **PART F: CHALLENGES IN IMPLEMENTING AN AUTOMATED INFORMATION SYSTEM**

24. Was CUEA system implementation faced with change resistance?

25. If yes, how was resistance to change reduced?

.....  
.....  
.....

26. What other challenges did the library experience in the implementation of automated system?

.....  
.....  
.....

27. In your opinion, how can the challenges be overcome?

.....  
.....  
.....

**THANKYOU**

## Appendix 2: Interview Guide to of ICT Department

I am a student at the school of information sciences, Moi University undertaking a Master of philosophy Degree in information sciences, majoring in library and information studies. I am carrying out a research study titled “**Change Management Strategies in the Implementation of Automated Library Information Systems at CUEA**”. The aim of the study will be to investigate change management strategies in the implementation of automated library system in CUEA library with a view of proposing a framework for successful implementation.

The researcher has chosen you as one of the respondents in the study. Kindly spare a few minutes to give your response to the following. Be as honest as possible in your answers. The information gathered will be treated with confidence, and be only be used for academic purposes.

### **PART A: BACKGROUND INFORMATION**

1. How long have you worked at CUEA ICT department?

.....

2. How long have you worked in the current position? .....

3. Which automated library Information Systems have you seen implemented during your stay at CUEA?

.....

.....

### **PART B: USE AND APPLICATION OF AUTOMATED LIBRARY SYSTEMS**

4. Have you personally used the current system in the CUEA library?

YES
NO

5. If yes, for what library operations and services do you personally use the system?

.....

.....

.....

6. If no, what reasons can you give?

.....  
 .....

**PART C: REASONS FOR CHANGE OF AUTOMATED INFORMATION SYSTEM**

7. Do you think the library was justified to change the system?

.....  
 .....  
 .....

8. What are the factors do you think necessitated CUEA library need to change its automated system from the past to the current one?

.....  
 .....  
 .....

**PART D: APPROACHES/PROCEDURES USED IN IMPLEMENTATION OF AUTOMATED LIBRARY SYSTEMS**

9. How do you understand the term change management?

.....  
 .....  
 .....

10. Are you aware of the current automated system being used in the library?

YES
NO

11. Were you involved in the implementation process?

YES
NO

If yes, what role did you play in the implementation process?

.....  
.....  
.....

12. How does the library top management communicate its goals to the university ICT department?

.....  
.....  
.....

13. Does the CUEA ICT department support the library in the implementation of automated information systems?

YES
NO

14. If yes how?

.....  
.....  
.....

15. What change management strategies do you think are vital for ensuring successful implementation of automated information systems?

.....  
.....  
.....

16. In your opinion, do you think the implementation of the past automated system(s) failed?

YES
NO

17. If yes, why do you think they failed?

.....  
.....  
.....



18. Do you think CUEA library used the right change management strategies in their implementation of the new/current system?

YES
NO

19. If No, where do you think they failed?

.....

.....

.....

**PART E: PERCEPTION AND ATTIDUES OF LIBRARY STAFF AND USERS**

20. Are you familiar with the current library system?

YES
NO

21. If yes, how was it made familiar to you?

.....

.....

.....

**PART F: CHALLENGES IN IMPLEMENTING AN AUTOMATED INFORMATION SYSTEM**

22. What kinds of uncertainties affect IT system implementation?

.....

.....

.....

23. How have the rapid changes of library automated system affected the University's ICT department perception of the new library system?

.....  
.....  
.....

24. What challenges affect implementation of automated information systems in general

.....  
.....  
.....

25. What is your advice to CUEA library in solution to these challenges

.....  
.....  
.....

**THANKYOU**

### **Appendix 3: Interview Guide to Other Library Staff (Circulation, technical and ICT Services Librarians)**

I am a student at the school of information sciences, Moi University undertaking a Master of philosophy Degree in information sciences, majoring in library and information studies. I am carrying out a research study titled “**Change Management Strategies in the Implementation of Automated Library Information Systems at CUEA**”. The aim of the study will be to investigate change management strategies in the implementation of automated library system in CUEA library with a view of proposing a framework for successful implementation.

The researcher has chosen you as one of the respondents in the study. Kindly spare a few minutes to give your response to the following. Be as honest as possible in your answers. The information gathered will be treated with confidence, and be only be used for academic purposes.

#### **PART A: BACKGROUND INFORMATION**

1. Your designation/title.....
  
2. How long have you worked at CUEA Library?  
.....
  
3. How long have you worked in the current position? .....
  
4. Which automated library Information Systems have you seen implemented in the library during your stay at CUEA?  
.....  
.....  
.....

#### **PART B: USE AND APPLICATION OF AUTOMATED LIBRARY SYSTEMS**

5. For what library operations and services do you use the system?  
.....  
.....  
.....  
.....

**PART C: REASONS FOR CHANGE OF AUTOMATED INFORMATION SYSTEM**

6. What are the factors do you think necessitated CUEA library need to change its automated system from the past to the current one?

.....

.....

.....

7. Comparing the past systems and the current one, do you think the issues resulting to the change of the system are solved?

YES
NO

8. If no, why?

.....

.....

.....

**PART D: APPROACHES/PROCEDURES USED IN IMPLEMENTATION OF AUTOMATED LIBRARY SYSTEMS**

9. How do you understand the term change management?

.....

.....

.....

10. Were you involved in the system implementation process?

YES
NO

11. If yes, what role did you play in the implementation process?

.....

.....

.....

12. If no, what reasons can you give?

.....  
.....  
.....

13. How does the library top management communicate its goals to the library staff

.....  
.....  
.....

14. Are you familiar with the current library system?

YES
NO

15. How were you made familiar with the current library system?

.....  
.....  
.....

16. What change management strategies did CUEA use to implement V-Smart system?

.....  
.....  
.....

17. In your opinion, do you think the implementation of the past automated system(s) failed?

YES
NO

18. If yes, why do you think they failed?

.....  
.....  
.....

19. Do you think CUEA library used the right change management strategies in their implementation of the new/current system?

YES
NO

20. If No, where do you think they failed?

.....

.....

.....

.....

**PART E: PERCEPTION AND ATTIDUES OF LIBRARY STAFF AND USERS**

21. How have the rapid changes of library automated system affected your perception of the automated library system?

.....

.....

.....

**PART F: CHALLENGES IN IMPLEMENTING AN AUTOMATED INFORMATION SYSTEM**

22. What challenges did you experience when the current system was being implemented?

.....

.....

.....

23. What is your advice to CUEA library in solution to these challenges

.....

.....

.....

**THANK YOU**

#### **Appendix 4: Interview Guide to Faculty Members**

I am a student at the school of information sciences, Moi University undertaking a Master of philosophy Degree in information sciences, majoring in library and information studies. I am carrying out a research study titled “**Change Management Strategies in the Implementation of Automated Library Information Systems at CUEA**”. The aim of the study will be to investigate change management strategies in the implementation of automated library system in CUEA library with a view of proposing a framework for successful implementation.

The researcher has chosen you as one of the respondents in the study. Kindly spare a few minutes to give your response to the following. Be as honest as possible in your answers. The information gathered will be treated as confidential, and will only be used for academic purposes.

#### **PART A: BACKGROUND INFORMATION**

1. How long have you been at CUEA? .....
2. How long have you been using CUEA library services? .....
3. Which automated library Information Systems have you seen implemented in the library during your stay at CUEA?  
.....  
.....  
.....

#### **PART B: USE AND APPLICATION OF AUTOMATED LIBRARY SYSTEMS**

4. Do you use the library system?

YES
NO

5. If yes, for what library operations and services do you use the system?

.....  
.....  
.....

6. If No, kindly could you give reasons?

.....  
.....  
.....

**PART C: REASONS FOR CHANGE OF AUTOMATED INFORMATION SYSTEM**

7. Did you as a user have issues with the previous automated library systems in CUEA?

YES
NO

8. If yes, what issues?

.....  
.....  
.....

9. Why do you think the system was changed?

.....  
.....  
.....

**PART D: APPROACHES/PROCEDURES USED IN IMPLEMENTATION OF AUTOMATED LIBRARY SYSTEMS**

10. How did you know of the existing library system?

.....  
.....  
.....



11. Comment on your level of awareness of the automated library system and its services?

.....  
 .....  
 .....

12. Have you ever participated in any information literacy training organized by the library?

YES
NO

13. Have you ever participated/been involved in giving suggestions on what the automated information system should provide or include?

YES
NO

14. If yes, in Q20 above was your system requirement request met?

.....  
 .....  
 .....

15. What general opinions did you have or wish to give in regard to the system?

.....  
 .....  
 .....

16. What other suggestions would you give towards the improvement of the information system?

.....  
 .....  
 .....

**PART E: PERCEPTION AND ATTIDUES OF LIBRARY STAFF AND USERS**

17. How have the rapid changes of library automated system affected your perception of the automated library system?

.....  
 .....

18. How do you rate the library system?

.....  
.....  
.....

**PART F: CHALLENGES IN IMPLEMENTING AN AUTOMATED INFORMATION SYSTEM**

19. Has the change of library system affected you in any way?

YES
NO

20. If yes, explain how?

.....  
.....

21. ....

If no, what reasons can you give?

.....  
.....  
.....

22. What challenges do you face when obtaining information from the library system?

.....  
.....  
.....

**THANK YOU**

### **Appendix 5: Interview Guide to CUEA Departmental Staff**

I am a student at the school of information sciences, Moi University undertaking a Master of philosophy Degree in information sciences, majoring in library and information studies. I am carrying out a research study titled “**Change Management Strategies in the Implementation of Automated Library Information Systems at CUEA**”. The aim of the study will be to investigate change management strategies in the implementation of automated library system in CUEA library with a view of proposing a framework for successful implementation.

The researcher has chosen you as one of the respondents in the study. Kindly spare a few minutes to give your response to the following. Be as honest as possible in your answers. The information gathered will be treated as confidential, and will only be used for academic purposes.

#### **PART A: BACKGROUND INFORMATION**

1. Years of service.....
  
2. How long have you been at CUEA? .....
  
3. How long have you been using CUEA library services? .....
  
4. Which automated library Information Systems have you seen implemented in the library during your stay at CUEA?  
.....  
.....  
.....

#### **PART B: USE AND APPLICATION OF AUTOMATED LIBRARY SYSTEMS**

5. Do you use the library system?

YES
NO

6. If yes, for what library operations and services do you use the system?

.....  
.....  
.....

7. If No, kindly could you give reasons?

.....  
.....  
.....

**PART C: REASONS FOR CHANGE OF AUTOMATED INFORMATION SYSTEM**

8. Did you as a user have issues with the previous automated library systems in CUEA?

.....  
.....  
.....

9. If yes, what issues?

.....  
.....  
.....  
.....

10. Why do you think the system was changed?

.....  
.....  
.....

**PART D: APPROACHES/PROCEDURES USED IN IMPLEMENTATION OF AUTOMATED LIBRARY SYSTEMS**

11. How did you know of the existing library system?

.....  
.....  
.....

12. Comment on your level of awareness of the automated library system and its services?

.....  
.....  
.....

13. Have you ever participated in any information literacy training organized by the library?

YES
NO

14. If yes, who organized the training?

.....  
.....  
.....

15. Have you ever participated/been involved in giving suggestions on what the automated information system should provide or include?

YES
NO

16. If yes, in Q15 above was your system requirement request met?

.....  
.....  
.....

17. What general opinions did you have or wish to give in regard to the system?

.....  
.....  
.....

18. What other suggestions would you give towards the improvement of the information system?

.....  
.....  
.....

**PART E: PERCEPTION AND ATTIDUES OF LIBRARY STAFF AND USERS**

19. How have the rapid changes of library automated system affected your perception of the automated library system?

.....  
.....  
.....

How do you rate the library system?

.....  
.....  
.....

**PART F: CHALLENGES IN IMPLEMENTING AN AUTOMATED INFORMATION SYSTEM**

20. Has the change of library system affected you in any way?

YES
NO

21. If yes, explain how?

.....  
.....  
.....

22. If no, what reasons can you give?

.....  
.....  
.....

23. What challenges do you face when obtaining information from the library system?

.....  
.....  
.....

**THANK YOU**

### **Appendix 6: Focus Group Discussion Guide**

I am a student at the school of information sciences, Moi University undertaking a Master of philosophy Degree in information sciences, majoring in library and information studies. I am carrying out a research study titled “**Change Management Strategies in the Implementation of Automated Library Information Systems at CUEA**”. The aim of the study will be to investigate change management strategies in the implementation of automated library system in CUEA library with a view of proposing a framework for successful implementation.

The researcher has chosen you as one of the respondents in the study. Kindly spare a few minutes to give your response to the following. Be as honest as possible in your answers. The information gathered will be treated as confidential, and will only be used for academic purposes.

#### **PART A: BACKGROUND INFORMATION**

1. Year of study.....
  
2. How long have you been at CUEA? .....
  
3. How long have you been using CUEA library services? .....
  
4. Which automated library Information Systems have you seen implemented in the library during your stay at CUEA?  
.....  
.....  
.....

#### **PART B: USE AND APPLICATION OF AUTOMATED LIBRARY SYSTEMS**

5. Do you use the library system?.....
  
6. If yes, for what library operations and services do you use the system?  
.....  
.....  
.....

7. If No, kindly could you give reasons?

.....  
.....  
.....

**PART C: REASONS FOR CHANGE OF AUTOMATED INFORMATION SYSTEM**

8. Did you as a user have issues with the previous automated library systems in CUEA?

.....  
.....

9. ....

If yes, what issues?

.....  
.....  
.....

10. Why do you think the system was changed?

.....  
.....  
.....

**PART D: APPROACHES/PROCEDURES USED IN IMPLEMENTATION OF AUTOMATED LIBRARY SYSTEMS**

11. How did you know of the existing library system?

.....  
.....  
.....

12. Comment on your level of awareness of the automated library system and its services?

.....  
.....  
.....



13. Have you ever participated in any information literacy training organized by the library?

.....  
.....  
.....

14. If yes, who organized the training?

.....  
.....  
.....

15. Have you ever participated/been involved in giving suggestions on what the automated information system should provide or include?

.....  
.....  
.....

16. If yes, in Q15 above was your system requirement request met?

.....  
.....  
.....

17. What general opinions did you have or wish to give in regard to the system?

.....  
.....  
.....

18. What other suggestions would you give towards the improvement of the information system?

.....  
.....  
.....

**PART E: PERCEPTION AND ATTIDUES OF LIBRARY STAFF AND USERS**

19. How have the rapid changes of library automated system affected your perception of the automated library system?

.....  
.....  
.....

20. How do you rate the library system?

.....  
.....  
.....

**PART F: CHALLENGES IN IMPLEMENTING AN AUTOMATED INFORMATION SYSTEM**

21. Has the change of library system affected you in any way?

YES
NO

22. If yes, explain how?

.....  
.....  
.....

23. If no, what reasons can you give?

.....  
.....  
.....

24. What challenges do you face when obtaining information from the library system?

.....  
.....  
.....

**THANK YOU**

### Appendix 7: Time Frame May 2012- APRIL 2014

TASKS	Proposal Writing	Proposal Defense	After Defense Corrections	Interviews & Focus Group Discussions	Data Analysis	Report Writing	Submission
<b>Year 2012</b>							
JAN							
FEB							
MARCH							
APRIL							
MAY	✓						
JUNE	✓						
JULY	✓						
AUGUST	✓						
SEPTEMBER	✓						
OCTOBER	✓						
NOVEMBER	✓						
DECEMBER	✓						
<b>YEAR 2013</b>							
JAN	✓						
FEB	✓						
MARCH	✓						
APRIL		✓	✓				
MAY			✓				
JUNE			✓	✓			
JULY				✓			
AUGUST				✓			
SEPTEMBER					✓		
OCTOBER					✓		
NOVEMBER					✓		
DECEMBER						✓	
<b>YEAR 2014</b>							
JAN						✓	
FEB						✓	
MARCH						✓	
APRIL							✓

**Appendix 8: Research Budget Table**

	<b>ITEM</b>	<b>NUMBER OF UNITS</b>	<b>COST PER UNIT</b>	<b>TOTAL COST (KSHs)</b>
	Computer	1	45,000	45,000
	Printer/Scanner	1	20,000	20,000
	Printing Paper	10 realms	500	5,000
	Stationery			30,000
	Printing			10,000
	Photocopying			5,000
	Binding	10 copies	200	2,000
	Research Assistance			15,000
	Transport			10,000
	Meals			10,000
	Airtime			5,000
	Miscellaneous			10,000
	<b>TOTAL</b>			<b>167,000</b>