

**INFORMATION TECHNOLOGY ADOPTION  
DETERMINANTS IN IMPROVING HUMAN RESOURCE  
FUNCTION IN KENYAN PUBLIC UNIVERSITIES**

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**Information Technology Adoption Determinants in Improving Human  
Resource Function in Kenyan Public Universities**

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## **DECLARATION**

This Thesis is my original work and has not been presented for a degree in any other university.

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## **DEDICATION**

To my wife Regina Kagwiria and my son Felix Anunda.

## **ACKNOWLEDGEMENT**

First, I thank the almighty God for giving me the physical and emotional strength throughout my academic journey. I am immensely indebted to my supervisors Dr. Iravo M. Amuhaya and Dr. Antony Waititu for their in-depth scholarly criticisms of my work.

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## **ACRONYMS AND ABBREVIATIONS**

**HR**-Human Resources

**HRIS**-Human Resource Information System

**HRM**-Human Resource Management

**ICT**-Information, Communication Technology

**IS**- Information Systems

**IT**-Information Technology

**UTAUT**- Unified Theory of Acceptance and Use of Technology

## DEFINATION OF TERMS

**Database-** is a collection of related files or tables containing data. (Rainer, R.K., et al., 2007).

**Hardware-** is a device such as the processor, monitor, keyboard, and printer. Together these devices accept data and information, process them, and display them ( Rainer, R.K., et al.,2007).

**Human Resource Function/Department-** deals with management of people within the organization. It is responsible for organization of people in the entire company and plans for future ventures and objectives involving people in the company. (Handy, 1999).

**Human Resource Information Systems-**Systems used to collect, record, store, analyze, and retrieve data concerning an organization's human resources. Gomez-Mejia et al. (2006).

**Information-** Data that have been organized so that they have meaning and value to the recipient (Rainer, R.K., et al., 2007).

**Information Literacy-** is the capacity of people to recognize their information needs; locate and evaluate the quality of information; store and retrieve information; make effective and ethical use of information and apply information to create and communicate knowledge (Catts & Lau, 2008).

**Information System** – a process that collects, processes, stores, analyses, and disseminates information for a specific purpose; most ISs are computerized(Rainer, R.K., et al., 2007).

**Information Technology Infrastructure-** consists of the physical facilities, IT components, IT services, and IT personnel that support the entire organization (Rainer, R.K., et al., 2007).

**Information Technology-** refers to all technologies that collectively facilitate construction and maintainance of information system (Zo, 2009).

**Network-** is a connecting system (wireless or wireline) that permits different computers to share resources (Rainer, R.K., et al., 2007).

**People-** Those individuals who use the hardware and software interface with it, or use its output (Rainer, R.K., et al., 2007).

**Procedures-** are a set of instructions about how to combine the hardware, software, database, and network in order to process information and generate the desired output (Lukas, 2005).

**Software-** is a program or collection of programs that enable the hardware to process data (Rainer, R.K., et al., 2007).

**Telecommunications-** Hardware and software that facilitates fast transmission and reception of text, pictures, sound, and animation in the form of electronic data (Zo, 2009).



## **ABSTRACT**

In the current Information Age, adoption of Information Technology (IT) in all sectors of the economy has been in top gear in all parts of the world. In Kenya organizations both public and private are shifting towards utilization of IT in running activities of the various departments including the Human Resource Department. However, the adoption of IT according to previous studies has been hampered by a number of challenges including lack of a proper IT policy framework, ineffective IT implementation procedures, low levels of IT literacy and lack of IT Infrastructure. Basing on the Unified Theory of Acceptance and Use of Technology (UTAUT) this study aimed at investigating whether IT policy framework, IT implementation procedures, IT literacy and IT Infrastructure are determinants in successfully adopting IT in the Human Resource function in Kenyan public universities.

The study used descriptive survey research design where both qualitative and quantitative techniques were employed to analyze data. The sample sizes of 123 respondents were derived from the target population of 130 in the Human Resource Department employees within the seven public universities. Questionnaires developed by the researcher were used as the main data collection instrument. Frequencies and percentages were used to analyze the data descriptively while Tests for significance that is t-test and F-test were used to test the significance of the independent variables and the dependent variable. For the Hypotheses to be accepted or rejected comparison was done between the critical t and calculated. In addition, the researcher used the multiple linear

Regression Analysis, to model the relationship between adoption of IT for Improving Human Resource Function and the predictor variables.

The main findings of the study were that though there is a linear relationship between IT Policy Framework and Improvement of HR function due to IT adoption it is negligible the same results were reflected when it came to IT Implementation Procedure. On the other hand a strong relationship existed between IT Literacy and IT Infrastructure and Improvement of HR Function due to IT adoption. Further, individually all the four independent variables had a positive effect on the dependent variable and the effect increases when the independent variables are combined.

The study recommended the need to match our well documented IT Policy framework and IT Implementation Procedures with investments in training and development to boost IT Literacy levels and provision of necessary IT Infrastructure. It is believed that this study will not only benefits the Human Resource Department in Kenyan Public Universities but also all individuals and Corporate bodies that are keen to adopt IT in undertaking their mandate.

## **CHAPTER ONE**

### **1.0 GENERAL INTRODUCTION**

#### **1.1 Background of the Study**

Technology and more so information technology (IT) has been one of the major causes of changes in the world especially now when we are living in the information age. Since the nineteenth century, the decline in manufacturing employment has been taken up by two sectors- the service sector and the information sector (Curtis and Cobham, 2008). According to Scott (1986) the information technology industry is the largest and fastest –growing industry in the world. The main driving force behind this development in the information technology world is the discovery of computers. Byars and Rue (1997) argue that computer has become almost as familiar as the typewriter was 30 years ago and according to Lucas (2005) some call the computer “the machine that changed the world.”

However, the debate on whether information technology has had a positive or negative impact on organizations is far from over since arguments and counter arguments are springing up every single day. On one hand, articles in the press and respected management journals constantly describe how organizations have improved their operations, generated new business opportunities and outperformed their competitors by means of well selected and deployed IT (Ward and Daniel,2006). According to Lucas (2005) IT has contributed in providing new ways to design organizations and new organizational structures, presented new opportunities for electronic commerce,

contributed to the productivity and flexibility of knowledge workers among many others. There is now a well developed body of macro economics evidence that information technology investments are likely to have “paid-off” with higher levels of productivity growth in industries that invested more heavily in IT in recent years (Jorgenson, et al 2003).

On the other hand, Lucey (1997) indicates that contrary to the impression given by some consultants and computer manufactures the mere fact of using IT does not in itself automatically bring benefits. Further, according to Ward and Daniel, (2006) reports in the press continue to recount the stories of failed IS and IT investments. Despite, over almost four decades experience of using and investing in information systems, it might appear that organizations have made little progress with project failure rates doggedly sticking to around 70%. In addition, the provocatively titled article ‘IT doesn’t not matter’ by Carr in 2003 he suggested that the considerable investments organizations continue to make in IT are wrong-headed. Regardless of the mixed reactions on the effect of information Technology investments on information technology is ongoing in all departments in an organization.

Human resource function is one of the key departments in any organization that is involved in HRM activities such as Human Resource planning, Recruitment and selection, Training and Development, Performance Management and Industrial Relations among others. Studies undertaken in developed countries indicate that HR department has not been left behind in taking note of the current trends in technology.

Scholars have detected trend towards Information Technology adoption in Human Resource function and argue that though investments in IT are in top gear information tools applied to employees pale in comparison with those used in other functional areas like Marketing, Finance, etc. (Dunivan, 1991; Boudreau, 1995). This trend of lagging behind was not only noticed in the 1990's but also as recent as beyond 2000 but according to Grobler and Warnich (2006) perhaps later than many other business functions, technology has recently come into HRM in a major way.

Regardless of this late adoption of Information Technology it has come to transform the way the Human Resource Department plays its roles in a positive way. Scott and Bohlandern (2007) noted that information technology, of course, changed the face of HRM in the United States and abroad. Perhaps the most central use of technology in HRM is an organization's Human Resources Information System (HRIS). The most obvious impact has been operational, that is, automating routine activities, alleviating administrative burdens, reducing costs, and improving productivity internal to the HR function itself. Further, Teo, et.al (2001) notes that there has also been some evidence to suggest that HR has been a laggard in adopting IT but does not provide reasons for this. Consequently, the success of this trend towards IT adoption in HRM practices can only be guaranteed if there is proper understanding of the critical factors in adopting Information Technology.

In Kenya, the achievement of an information-based society is one of the main priorities... in order to realize national development goals and objectives for wealth and

employment creation” (Poghisio, 2008). After several years of effort, Kenya promulgated a National ICT Policy in January 2006 that aims to “improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services.” The Kenyan ICT policy and the closely related e-government strategy, the government has a mission “to use information and communication technology to improve the livelihoods of the people of Kenya and optimize its contribution to the development of the economy by ensuring the availability of efficient ,reliable and affordable info-communication services throughout the country ( Kenya’ s ICT policy,2006).

The national policy has several sections, including information technology, broadcasting, telecommunications, and postal services. However, it is the section on information technology that sets out the objectives and strategies pertaining to ICT and education. The relevant objective in this section states that government will encourage “...the use of ICT in schools, colleges, universities and other educational institutions in the country so as to improve the quality of teaching and learning. Surprisingly, in terms of adoption of information communication technology according to Siambi (2008) the vice-chairman of public service commission, Kenya has come a long way from the era of using mainframe computers to the modern world of wireless and mobile technology, ICT as evident in the country’s national plans and other government initiatives. In 2007, the government launched the ICT Board to oversee the development of ICT in Kenya

and the National Analogue Digital Broadcasting migration plan to be finalized by 2012 (Kenya vision 2030).

To achieve Kenya vision 2030, it is indicated that as part of the on-going public sector reforms, the government has endeavored to leverage the use of information technology in order to give Kenyans services that are prompt, convenient and responsive to their demand. The development of integrated government-wide information systems has been accelerated. These include the integrated financial Management System and integrated Personnel and Payroll system, online recruitment and selection system, online exam results and pension system. The efforts towards full integration of ICT into systems of government has also trickled down to various ministries and institutions under them as a major flagship towards the realization of vision 2030.

According to the article ‘Knowledge creation and dissemination in African Universities with special reference to ICT’ written by Teffarra ( 2004) published in African Universities in the 21<sup>st</sup> Century book of CODESTRIA, as developments in and usage of Information and Communications Technology (ICT) in the developed world have intensified, the scope and dimension of communicating and advancing knowledge have evolved remarkably. African Universities as major consumers, brokers, and producers of the knowledge industry in the continent-bear witness to the unfolding events and developments. In the Higher Education sector, the adoption and use of ICT services is realized through the extent to which ICT supports and fosters innovative research

learning and teaching in addition to supporting administrative processes in these institutions. According to Pfeffer (2003) ICT has a clear impact on universities in a holistic and comprehensive manner, not only on academic processes but on functions. However, according to Teferra (2004) the extent and scope of the utilization of ICT by African Universities, and how it affects research, teaching, and other scholarly activities, remain a less studied area.

### **1.1 Statement of the Problem**

The level and speed to which Information Technology is being adopted and implemented at Kenyan public universities has been applauded by many scholars such as Mutula, (2004), Wanyembi, (2002), Agbonlour (2006), Farrell, (2007) among many others. Specifically, Mutula (2004) notes that the clamor for and rapid rise in the application of computers in both academic and administrative departments is a clear sign of this recognition. However, the adoption and implementation has been characterized by many shortcomings due to a number of limitations.

First, there are no policy frameworks, at either organizational or national level, to guide the adoption of this technology to realize its full potential benefits [DN 9 July, 2001]. Within a short period of time, public universities in Kenya have had to cope with a diversity of new ICT related problems over and above their old '*normal*' problems on the economic, social, governmental and political fronts. Ayoo and Otiike (2002) note that the formulation of an information policy in Kenya is hampered by the lack of



information skills, mainly among top policy makers, which results in making the wrong choices of ICTs. Secondly, information Technology implementation procedures appear to be disjointed and disorganized according to Wanyembi(2002) who noted that the manner in which information and communication technology was introduced in Kenyan public universities was initially piecemeal, uncoordinated, and in most cases haphazard.

Thirdly, according to Mutula (2004) the new problems, which are closely linked with the introduction of the computer technology, include low computer literacy among staff among other reasons. In agreeing with this state of affair Tilvawala et al (2009) notes that one barrier to the efficient utilization of ICT in developing countries is the relatively low level of information literacy. Finally, another challenge facing the adoption of Information Technology is securing and installing the information and communication technology (ICT) resources (Mutula, 2004). According to a World Bank Institute survey, the state of ICT infrastructure in African universities can be summed up as “too little, too expensive, and poorly managed (Farrell, 2007).”

Though the above challenges, facing Information Technology adoption have been detected in other areas within public universities in Kenya such as the library department Wanyembi (2002), there lacks evidence of a study of their effect on the adoption of Information Technology in human resource function. This raises the general question whether these challenges are the determinants in successful adoption of IT for improving Human Resource Function in Kenyan Public Universities.

### **1.3 Research Objectives**

### **1.3.1. General Objective**

To analyze the effect of the determinants in adoption of Information Technology on improvement of Human Resource Function in Kenyan public Universities.

### **1.3.2. Specific Objectives**

1. To investigate the effect of IT policy framework on improvement of Human Resource Function in Kenyan public universities.
2. To determine the effect of information Technology implementation procedures on improvement of Human Resource function in Kenyan public universities. .
3. To investigate the effect of Information Technology literacy on improvement of Human Resource Function in Kenyan public universities.
4. To determine the effect of Information Technology Infrastructure on improvement of Human Resource Function in Kenyan public universities.

## **1.4 Research Hypothesis**

1.  $H_0$  There is no linear relationship between IT Policy framework and improvement of Human Resource Function in Kenyan public universities.

$H_1$ : There is linear relationship between IT Policy framework and improvement of Human Resource Function in Kenyan public universities.

2.  $H_0$ : There is no linear relationship between IT implementation procedures and improvement of Human Resource Function in Kenyan public universities.

$H_1$ : There is linear relationship between IT implementation procedures and improvement of Human Resource Function in Kenyan public universities.

3.  $H_0$ : There is no linear relationship between Information Technology literacy and improvement of Human Resource function in Kenyan public universities.

$H_1$ : There is linear relationship between Information Technology literacy and improvement of Human Resource function in Kenyan public universities.

4.  $H_0$ : There is no linear relationship between Information Technology Infrastructure and improvement of Human Resource function in Kenyan public universities.

$H_1$ : There is linear relationship between Information Technology Infrastructure and improvement of Human Resource function in Kenyan public universities.

### **1.5 Justification of the Study**

The level of Information Technology utilization has been mentioned by previous studies such as Phillips, (2009) it has been low and slow in the Human Resource Function compared to other departments within organizations both in the developed and developing countries. Therefore this study is important in the sense that it will shed more light on why this is the situation. On the other hand, Information Technology being a relatively new field of study a lot of research is required to enhance proper understanding of the field which will enhance its adoption and proper utilization. It is noted that despite more than 20 years of research on IT innovations, organizational use of IT remains sparse and our understanding of IT use is still limited (Mishra and Agarwal, 2010). Worse still past recent studies on critical factors in adoption of IT have been undertaken in other countries neither of these studies has been done in Kenya nor in the public universities. Further, none has been undertaken in the Human Resource Management field. On the other hand, past studies carried out in Kenya have shown what ails the adoption of ICT in other areas but none has focused on the Human Resource function which makes this study timely and important.

Further, the outcome of the study will lead to proper IT application which ultimately will lead to improvement of public university institutional operations through creation of effective systems. In relation to the increased level of investment in Information Technology within the Human Resource function aimed at enhancing effectiveness in managing the Human Resource Asset there is need to reduce Information Technology

resource wastage either because of improper planning or poor implementation procedures. This can only be achieved through proper understanding of the critical factors that affect adoption of Information technology namely IT policy framework, IT implementation procedure, IT literacy and IT Infrastructure.

The study is important to public universities policy formulators as it will form a basis for proper policy formulation regarding the adoption of Information Technology in improving Human Resource function. Managers in public universities will benefit from the study as it will indicate to them the true picture regarding IT Policy and implementation procedures. The level of employee preparedness for adoption of IT by gaining insight into level of computer literacy among employees working in the human resource function and their perception towards information Technology adoption. Further the study will enable them to take an audit of their Information Technology Infrastructure available for the Human Resource Function.

### **1.6 Scope of the Study**

Due to the large number of factors considered to influence the adoption of Technology in this case information technology, the study focused only on IT Policy Framework, IT Implementation Procedures, Information Technology Literacy and Information Technology Infrastructure. Further, the study was confined to the human resource function in the seven public universities in Kenya as listed in appendix III where employees within the human resource function were picked as the target population for

the study. The research findings, therefore, may only be generalized to other populations with similar characteristics for example the private universities in Kenya.

### **1.7 Limitations and Delimitations**

Since all the public universities were involved in the study it was not easy for the researcher to collect data on his own and therefore sort the assistance of three research assistants to enable the researcher collect data on time for the study. The other challenge that was witnessed during this study is that public universities are at different stages of adoption of Information Technology. Further, the Human Resource Function Employees were also at different levels of understanding of aspects related to Information Technology adoption. These challenges were addressed by ensuring the questionnaire which was the main data collection instrument was well constructed to put into consideration the variations in adoption of Information Technology and where necessary the content of the questionnaire were explained to the respondents during the data collection stage. Finally the study only used the questionnaire to collect data and this made it difficult to gather accurate data on level of IT Literacy skills among the respondents other data collection methods such as experimentation and observation could have been the preferred method. This challenge was overcome by ensuring that the items used in the questionnaire were valid and reliable.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter contains details on theoretical background, proposed conceptual framework and review of literature each independent variable namely Information Technology policy framework, Information Technology Literacy, Information Technology infrastructure and Information Technology Implementation procedures. In addition, dependent variable which is improvement of Human Resource Function is discussed. Finally the chapter ends by undertaking a critique of empirical studies and highlighting research gap identified.

#### **2.2 Theoretical Background**

Scholars have come up with different theories in understanding how any form of Technology in this case Information Technology (IT) is adopted. Most of the times, these theories take one of the following forms or approaches: a diffusion approach, an adoption approach or a domestication approach (Titah et al. 2006). In 1989, basing his thoughts on the Theory of Reasoned Action (TRA) (Napoli, 2000; Castells, 1996, 2001), Davis developed the Technology Acceptance Model (TAM) in a bid to explain how the users come to accept and use technology (Curtin et al., 2003). In reviewing the acceptance of a technology, many researchers have used TAM. TAM has several attributes such as Perceived Usefulness – PU (the degree to which a person believes that

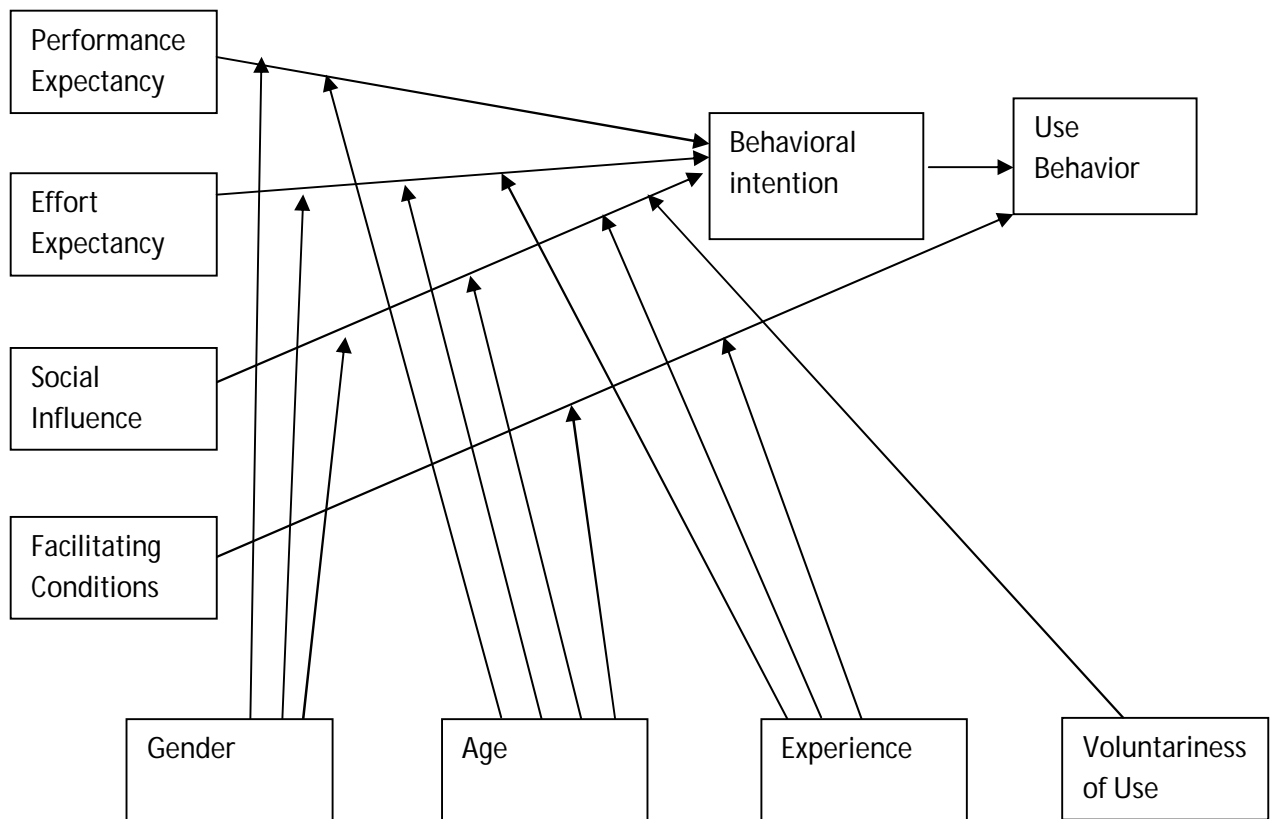
using a particular system would enhance her/his job performance); Perceived Ease of Use – PE (the degree to which a person believes that using a particular system would be free of effort) and the Subjective Norm – SN (the person's perception that most people who are important to him think he should or should not perform the behavior in question).

In order to succinctly explain the adoption model of technology, Venkatesh et al., (2003) extended the TAM and called it the Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT helps managers assess the likelihood (probability) of success for new technologies as well as understand the drivers of technology acceptance. Although there is no single theory or model can comfortably explain the adoption of Technology single-handedly just as noted by Carr, (2007), the study will consider the Unified Theory of Acceptance and Use of Technology (UTAUT) which was a review by Venkatesh et al. (2003) of the eight most prominent models/Theories that predict behavior intentions and/or usage. The eight models namely theory of reasoned action, technology acceptance model, motivational model, theory of planned behavior, a combined theory of planned behavior/technology acceptance model, model of PC utilization, innovation diffusion model theory and social cognitive theory were reviewed and consolidated.

The UTAUT has four predictors of behavior intention or usage namely Performance expectancy which is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance, effort expectancy the



degree of ease associated with the use of the system, social influence the degree to which an individual perceives that important others believe he or she should use the new system and facilitating conditions the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.



**Fig.2.1: Unified Theory of Acceptance and Use of Technology (UTAUT)\***

**\*Reproduced from Venkatesh et al. (2003)**

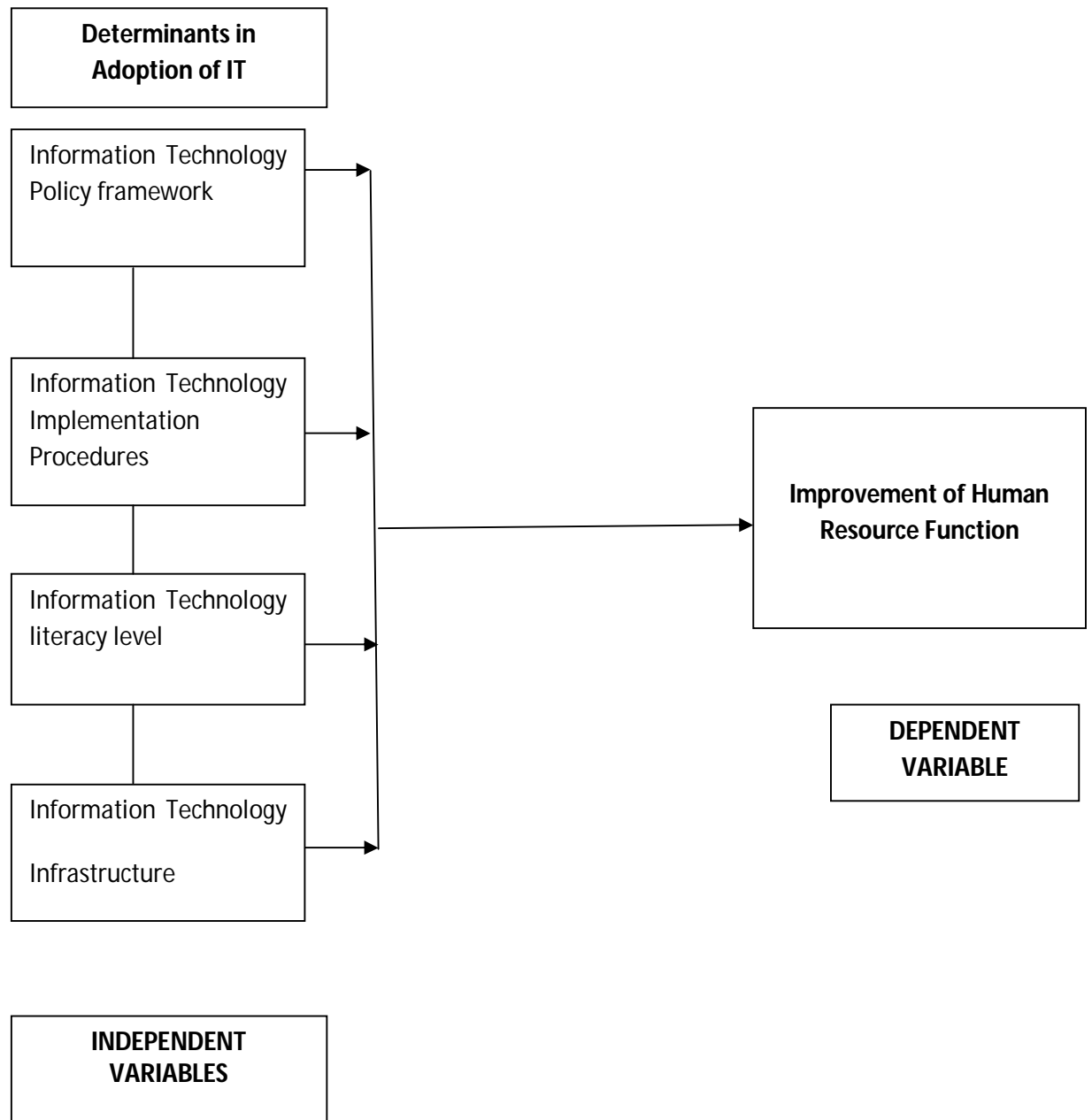
This theory is considered important to this study on adoption of IT in Human Resource function as it highlights performance expectations, Effort expectancy, social influence

and facilitating conditions as key determinants of adoption of Technology. However while the first three that is performance expectancy, effort expectancy and social influence have an effect on behavior intention and ultimately behavior use, Facilitating conditions directly affect behavior use. This study is focused on behavior use which is conceptualized in this study as adoption of Information Technology for improving Human Resource Function.

Facilitating conditions (FC) represents organizational and technical support and is typically significant in both voluntary and mandatory setting. The facilitating conditions although not mentioned in this theory which lead to adoption of Information Technology for Improving Human Resource Function are conceptualized as IT policy Framework, IT implementation Procedure, IT literacy and IT infrastructure basing on previous studies.

### **2.3 Conceptual Framework**

Basing on the Unified Theory of Acceptance and Use of Technology (UTAUT) which was developed by Venkatesh et al. (2003) the facilitating condition predictor were broken down into a conceptual framework developed by the researcher as indicated in figure 2.2 below.



**Figure 2.2: Conceptual Framework**

### **2.3.1 Operationalization of Variables**

#### **Independent Variables-IT Policy Framework.**

The guidelines set aside to aid in proper Information technology adoption indicating the objectives, scope, rules and regulations on users allowed to access the information technology systems, authorization and non-authorization, security matters among others.

#### **IT Implementation Procedure**

Information Technology implementation procedures encompasses all the processes involved in getting new software or hardware operating properly in its environment, including installation, configuration, running, testing, and making necessary changes.

#### **IT literacy Level**

Information literacy is the capacity of people to recognize their information needs; locate and evaluate the quality of information; store and retrieve information; make effective and ethical use of information and apply information to create and communicate knowledge (Catts & Lau, 2008).

#### **IT Infrastructure**

A set of IS resources and organizational capabilities that are shared across the organization and that provide the foundation on which IS applications are developed and business processes are supported.

## **Dependent Variable**

The improvements in the HR function if Information technology is successfully adopted in an organization such as saving an organization from a future increase in costs, lead to prospects of increased sales through offering new services, delivery channels, reduction of errors, enhancing communications and connectivity, promotional activities, or market penetration and among others.

## **2.4 Empirical Review**

### **2.4.1 Areas of IT Adoption in HR Function**

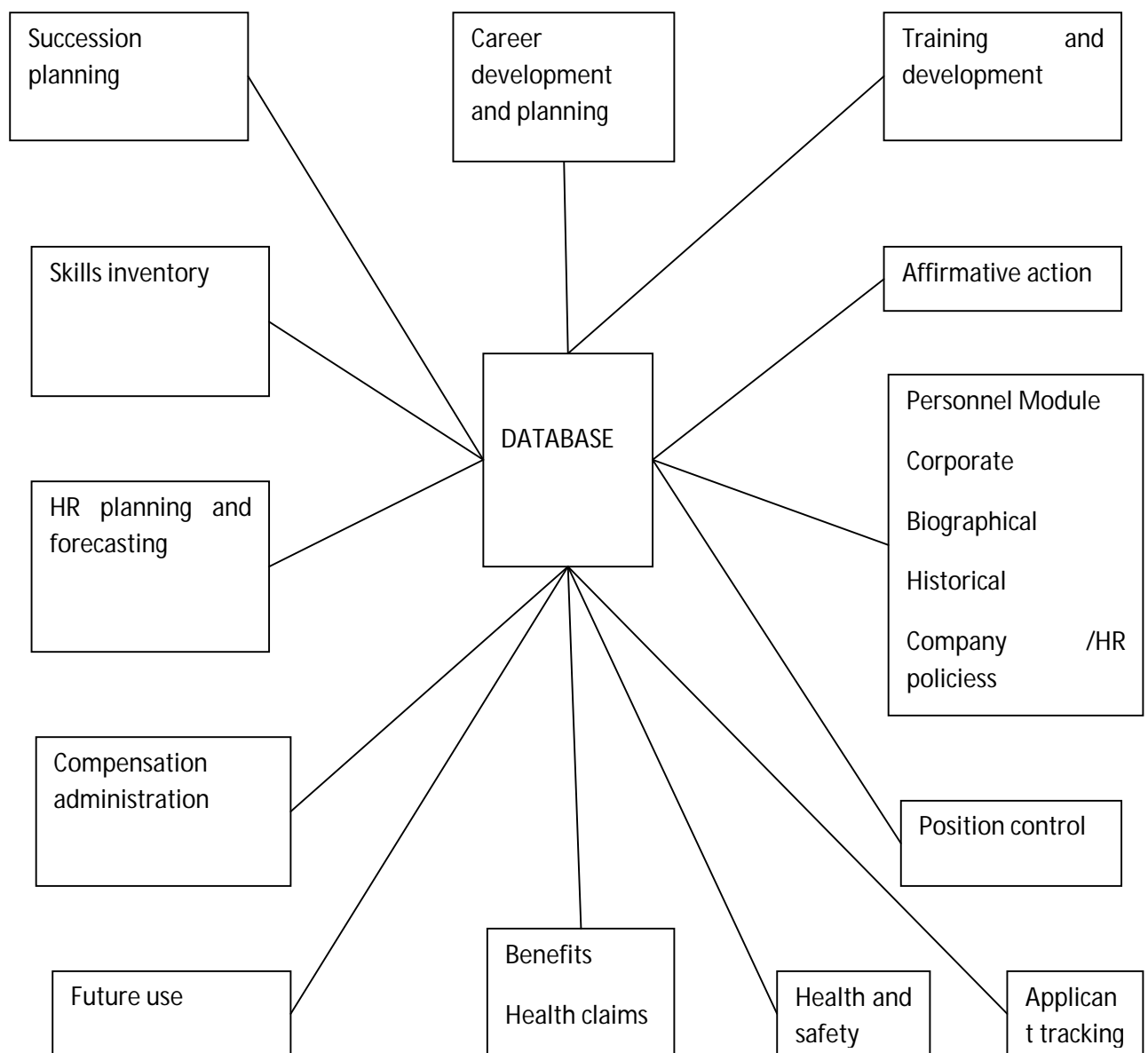
Human resource management has become more complex due to the fast growth in specialized occupations, the need to train and promote highly skilled employees, and the growing variety of benefits programs. HRM can be classified into five main activities according to Oz (2009): (1) employee record management, (2) promotion and recruitment, (3) training, (4) evaluation, and (5) compensation and benefits management. The effectiveness and efficiency of HR department to undertake these critical activities are depended upon the adoption of IT technology.

Although the adoption of IT in human resource management practices has not been in existence longer than other business functions it has started to pick up. According to Grobler and Warnich (2006) perhaps later than many other business functions, technology has recently come into HRM in a major way. For example, in the U.S.A survey show that 70% of large firms now use HR information system, 80% conduct

online recruiting, and 40% use web-based portals, as a means of communicating company policies and practices.

One of the big trends in recent years has been toward HRIS “self-service” setting up systems, usually on an intranet to allow managers to access and change their own benefits and other personal information. Today, however, software applications are available to automate far more HR activities than just payroll, records, and benefits information. All sorts of routine HR activities, from front to back, have seen some sort of automation. Companies are now using software to recruit, screen, and pretest applicants online before hiring them as well as to train and promote employees once they’ve been hired (Manzini and Grindley, 1986).

McLeod and Schell (2007) note, that HRIS provides information to managers throughout the firm concerning the firm’s human resources. The output subsystems of the HRIS each address a particular aspect of HR Management such as planning, recruiting and managing the workforce, compensating the employees; providing employee benefits; and preparing the many HR reports that are required by the environment, primarily government agencies. The table below indicates the possible areas that Information Technology can be utilized in Human Resource function as an effective Human Resource Information System.



**Figure 2.3: A fully developed HRIS database**

Source: adapted from Manzini, A.O. and Grindley J.D. (1986) integrating Human resources and Strategic Business Planning. Amazon: Washighton, D.C, p.42.

Applicant-tracking module maintains information on open jobs and also candidates for those jobs. It tracks applicants and their resumes and helps match candidates on file to the perquisites for open jobs. The module can also send lists of potentially qualified applicants to the employment manager. According to Oz (2009) this is can be used for promotion and recruitment activities of HR department. To select the best qualified person for a position, a human resource manager can search a database of applicants and existing employee's records for set criteria. Automating the selection process significantly minimizes the time and cost spent on recruitment. He further argues that Intranets (intraorganisational networks that support web applications) help HR managers post position vacancy announcements for employees to peruse and consider from their own PC's. This system is especially efficient in large organizations that employees that employ thousands of workers, and even more so at multisite organizations.

Currently, due to the growing number of growing job applicants many organizations refuse to receive paper applications and resumes. Therefore, it is no wonder that some companies may accept such documents via email, but that others accept only forms that are filled out and submitted on-line. HR consultants say that this process reduces the time spent on a typical search from several hours to several minutes. In addition, HR managers save the cost of publishing help wanted ads and can start reviewing resumes as soon as applicants respond online instead of waiting the typical 6-8 days from traditional advertising. It is wise noting some companies use the entire web as a database for their



search, which means they include in the search many people who have never applied for a job with them but have posted their resumes (Oz, 2009).

Training and development module an individual's training and development needs are compared with the training and development options available within an organization. Both employee's and manager's evaluations of training needs can be entered. As noted by Oz (2009), in most organizations in both the manufacturing and service sectors, multimedia software training is rapidly replacing training programs involving classrooms and teachers. Such applications include interactive, three dimensional simulated environments. Training software emulates situations in which employees act and includes tests and modules to evaluate a trainee's performance.

In addition, to the saving in trainer's time there are other benefits. The trainee is more comfortable because he or she controls the speed at which the sessions run. The software lets the trainee go back to a certain point in the session if a concept is missed. Also the software can emulate hazardous, situations, thereby testing employee performance in a safe environment. Developments in IT enable organizations to reduce the costs of training drastically as one can move the training materials and exams to a central website so employees can share and personalize learning. Using a web browser, they can find the materials they need , bookmark selected web pages, leave the training session when they wish, and come back to finish it later (Oz, 2009).

Basic personnel module is normally the first to be created since it's the cornerstone of the basic information to be found in the system. It includes information such as the name, Identity number, date of entry, job classification, location, job specializations and descriptions, salary comparison data, address, telephone numbers. Family particulars and other basic information required by the organization. According to Oz (2009) HR department must keep personnel records to satisfy both external regulations ( such as federal and state laws) and internal regulations, as well as for payroll and tax calculation and deposit, promotion consideration, and periodic reporting. Many HR ISs are now completely digitized (including employees' pictures) which dramatically reduces the space needed to store records, the time needed to retrieve them, and the costs of both.

Succession planning module focuses on the collection and maintenance of data that underlie succession charts. The information in this module can include the qualifications of employees in line to move into key positions in the organization, their tenure and performance evaluations as well as other criterion. Software helps managers standardize their employee evaluations by providing step-by-step guides to writing performance reviews, a checklist of performance areas to include in the evaluation ( with the option to add or remove topics), scales to indicate how strong the employee is in each area and the ability to select the relative importance each factor should hold in the overall evaluation. This helps to promote objectivity and consistency especially when several employees are

being considered for a promotion and their evaluations are compared to determine the strongest candidate.

Wage and salary administration module in the compensation area handles several major applications: 1) administering salary plans, 2) tracking and controlling various incentives, 3) bonus, commission plans, 4) participating in outside surveys and 5) handling stock purchase and /or stock option plans. In agreeing with this statement Oz (2009) indicates that Compensation and benefits management systems can help HR officers manage compensation efficiently and effectively. Programs can easily calculate weekly, monthly and hourly pay according to annual salaries and can include federal, state and local tax tables to assist in complying with compensation regulations.

The position control module enables an organization to track positions for monitoring, budgeting, planning and control purposes. On the other hand the Human Resource Planning module may provide information to help estimate future labour supply and demand by analyzing current staffing levels and skill mixes, turnover, promotions and other employee movements such as transfers and demotions. Finally, the skills inventory module collects stores and maintains records of individual qualifications and experience. It helps to answer the questions: does the organization have enough people with the specific skills to accomplish next year's production goals? Does it have the human resources to bid on a certain project requiring known levels of skills and if the organization wants to move into another market area or product line, does it have the people with experience in that area?

**Table 2.1: Most Common HR information Systems Application**

<b>Human Resource Activities</b>	<b>Information System application (%)</b>
Payroll	76.7
Benefits administration	57.1
Benefits enrollment	41.4
Recruiting-applicant tracking	39.1
Personnel administration	39.1
Training and development	31.6
Employee self-service	24.8
Manager self-service	18.0
Other	3.8

Source: “How HR managers Use Technology Applications to control HR department costs, “Human Resource Department Management Report, no.4-5 (May 2004).

### **2.4.2 Information Technology Policy Framework**

IT policy framework which can be defined as a written document detailing employee guidelines, personnel procedures and organizational rules on Information Technology are key to successful adoption of Information Technology. According to Baltzan and Phillips (2009) these policies set employee expectations about the organization's practices and standards and protect the organization from misuse of computer systems and IT resources. If an organization's employees use computers at work, the organization should, at a minimum, implement policies. Policies are policies and procedures that address the ethical use of computers and internet usage in the business environment.

However, IT Policy Framework should come into existence after the information strategy and IT strategy has been put in place organizations. Information which is at the centre of IT application is the starting point in ensuring effective and efficient utilization of IT technology. Hochstrasser and Griffiths (1991) noted that extensive discussions with company managers have indicated the need for guidelines to construct a comprehensive information strategy framework. Such a framework has been assembled from pockets of identified good practices in a broad range of companies. Its main components, as identified by the Kobler unit are the dynamic unification of business mission, competitor modeling, market performance indicators, customer feedback, operational needs and IT opportunities into a consistent and relevant set of management goals. Once such a set of goals has been agreed upon it can then be analysed in terms of

general information needs and concrete information requirements as a basis for generating a corporate information strategy.

While the information strategy delineates those information needs that are critical for a company's success, an IT strategy specifies how some of these needs are to be fulfilled. It is important to realize that the main thrust of an IT strategy is to plan the implementation of the Information strategy, and that an IT strategy can therefore only be specialized if an information strategy has first been put into place. The corporate strategy is then translated concrete information systems both IT and not IT based. An IT strategy is then devised by integrating the planning of further IT based information systems with IT installations and facilities currently in place.

The corporate IT strategy which according to Eason (1988) are controlled by the IT strategy committee needs to report directly to the Board of the company. Since the technology is ultimately at the service of the operation divisions of the organization, the chairman of the committee should be one of the general managers on the board. If the main duty of the board is to set company objectives and monitor progress towards their achievement, the remit of the IT strategy committee should be to pursue applications which serve the company's objectives. This will ensure that application objectives relate to the goals of the organization and are not driven by new technical possibilities, or by the particular concerns of a user department. The membership of this committee must include a cross-section of the interested parties in the organization which include

representatives of end-user departments and the senior staff of the IT providers within the organization.

However, this is not the case in most of the organizations since IT adoption is relegated to the IT department since it's taken to be a technical issue. According to Eason (1988) already information technology is one of the major forces shaping the way organizations are changing. We might then expect IT applications to be a major item on the agenda of company boards and for senior management resources to be devoted to the study of the potential of the technology. Whilst there a growing number of organizations where this is the case there are a great many more where the subject is left to technical specialists on the principle that it is a technical matter of no concern to general management.

This trend is dangerous as argued by Eason (1988) due to the fact that first, organizational objectives should be the guiding tools for formulation of IT strategy. The strategic application of IT depends on conceiving of ways in which the technology can be harnessed to serve major organizational objectives and senior management must be involved in setting these objectives and judging ways of meeting them. Second, the implementation of IT goes hand-in-hand with major organizational change. The establishment of future forms of organization structure and the management of the change process are the normal business of senior management. In agreeing with this Wheelen and Hunger (2004) argue that policies tend to be rather long lived and can even outlast the particular strategy that created them. Interestingly these general policies such as "research and development should get first priority on all budget requests", can

become in time, part of a corporation's culture. Such policies can make the implementation of specific strategies easier. They can also restrict top managements' strategic option in the future. Thus a change in strategy should be followed quickly by a change in policies. Managing policy is one way to manage the corporate culture.

Third, the application of IT can be used to strengthen the power of some sections of the organization against others. Shifts of power can occur between end-user departments and technical departments. If senior management are not involved in deciding what is in the interest of the organization as a whole, the application of IT may be determined by the most ambitious rather than the common good. Fourth, most definitions of IT draw attention to its convergent nature- it brings together data processing, text processing and telecommunications. It is therefore imperative that IT applications are planned at the highest level of the organization.

Consequently, to maintain a perspective on behalf of the whole organization, the structure responsible for IT applications has to have senior management presence and bring together the needs of end-user departments and the services of information technology suppliers. The adoption of IT in organizations should be a top agenda of the top brass of any organization who are tasked with coming up with the long term plans reflected in the vision, mission, and organizational objectives. These are reflected in the policy statements which are defined as the broad guidelines for implementation flowing from the selected strategy; policies provide guidance for decision making and actions throughout the organization (Wheelen and Hunger, 2004).



These policies typically embody the following; First ethical computer use policy, which contains general principles to guide computer user behavior. Second, acceptance user policy, which is a policy that a user must agree to follow in order to be provided access to a network or to the internet. Third, E-mail privacy policy that details the extent to which e-mail messages may be read by others. Fourth, internet use policy which contains general principles to guide the proper use of the internet and finally, anti spam policy which simply states that e-mail users will not send unsolicited e-mails (or spam).

It is clear that security of information is a crucial aspect of managing it and therefore it must be taken seriously. The need for an information security policy in strive towards the securing of information, has been established extensively in both the research and industry fields (Schneier, 2000; Whitman and Mattord, 2004). This is a clear indication that we can no longer rely entirely on our traditional security controls- e.g. physical access controls, security guards –to ensure the security of an organization’s assets, processes and communications. However, research findings show that, in many cases, security issues come as an-after-thought in the ongoing transformation to ICT-enabled organizational or governmental context (Tarimo, 2006).

Security of data is critical to the operations of firms. Without the ability to store, process and transmit data securely, operations may be compromised, with the potential for serious consequences to trading integrity (Clear, 2007).According to Whitman and Mattord (2003), “information security is the protection of information within a business, and the systems and hardware used to store, process and transmit this information”.

According to Mlangeni and Biermann (2006), the process of minimizing risks associated with information security includes the compilation of a detailed and standardized information security policy. Such a policy can among other things define issues such as threats and corresponding countermeasures in addition to defining roles and responsibilities of employees.

Information security policy also specifies the procedures, systems and tools required to protect an organization's information. The benefits of creating such a policy include; First, Responsibilities for the specific tasks involved in protecting your information (for example, reviewing firewall logs, conducting back ups, etc) will have been clearly defined and agreed, thereby ensuring that necessary tasks are actually carried out. Second, Information security policies will help the business understand exactly what tools and hardware are required for protecting their information. This can be valuable for resource planning and for ensuring that the firm's actual security measures are at an acceptable level. Third, Information security policies will help protect the business' investment in IT. This is achieved by defining what must be done to ensure all IT assets are adequately protected against damage. Finally, the practice of developing information security policies is becoming increasingly popular and may be considered a source of competitive advantage amongst security conscious business partners and customers (PricewaterhouseCoopers, 2002)

Kenya promulgated a National ICT Policy in 2006 noted early in the background aimed at improving the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services. Narrowing down to institutions of higher

learning in particular public universities in Kenya each university in Kenya has an ICT directorate and have developed. For example as documented in each university website, the University of Nairobi realized the strategic importance of ICT, and created a fully fledged ICT function, the ICT Centre in 2002, with the head of the centre, the Director ICT reporting to the Vice Chancellor. The university has continued to automate its functions to increase productivity and enhance efficiency in its operations. The ICT centre has a portfolio of computer based Information systems that support administrative services, teaching, research and learning, with a vast majority being developed in-house.

On the other hand, at Jomo Kenyatta University of Agriculture and Technology, the directorate Information Communication Technology (ICT) works closely with all the other departments in the university. It provides services to university staff and students. It is divided into three sections: information Systems (IS), Infrastructure Support Services (ISS) section and Research, Consultancy and Training (RCT) section. Activities of the three sections are harmonized to achieve the objectives of the department. Further, Kenyatta University has a directorate of ICT which was recreated in 2007 with a sole mandate of operationalising the ICT function of the university. The first objective was to develop and implement an evolutionary university ICT strategic plans; policies; standards; operational plans; budgets, sensitive to emerging technologies and responding to changing needs and practices. Moi university ICT policy addresses the basic needs of staff and students, especially those who require ICT skills and

technologies in the quest for knowledge in various disciplines. In Masinde Muliro the directorate of ICT was created in 2009 as a step towards implementing the University's ICT policy.

Although there is evidence of existence of ICT directorate in most of the public universities they are a number of questions we need to address. First, is there an ICT policy framework and is based on information strategy and IT strategy of the organization? Second, is there an IT strategy committee and what is the level of involvement of the end user departments such as Human Resource Department in such a committee? Third is the IT Policy Framework adequate in ensuring effectiveness and efficiency in adoption of IT in Human Resource Function. Finally, what are the key features of the IT policy and are employees informed of the content of it.

### **2.4.3 Information Technology Implementation Procedures**

Implementation is the carrying out, execution, or practice of a plan, a method, or any design for doing something. As such, implementation is the action that must follow any preliminary thinking in order for something to actually happen. In an information technology context, implementation encompasses all the processes involved in getting new software or hardware operating properly in its environment, including installation, configuration, running, testing, and making necessary changes. The word deployment is sometimes used to mean the same thing. On the other hand, Lucas (2005) notes, that Implementation is part of the process of designing a system and is a component of

change. New information systems change existing information processing procedures and often change the organization itself. Implementation refers to the design team's strategy and actions for seeing that a system is successful and makes a contribution to the organization.

Further, Lucas (2005) argues that researchers do not agree on an absolute indicator for successful implementation. One appealing approach is a cost-benefit study. In this evaluation, one totals the costs of developing a system and compares them with the dollar benefits resulting from the system. In theory, this evaluation sounds like a good indicator of success, but in practice it is difficult to provide meaningful estimates. However, an evaluation of the benefits of an information system eludes most analysts. The suggested categories for classifying the benefits or value provided by an application of technology include; infrastructure, required applications, applications where technology was the only solution, applications providing a direct return, applications with indirect returns, technology initiatives that are a competitive necessity, strategic applications and transformational information technology.

Further, successful implementation of technology is associated with variables both independent and dependent. The independent variables include first, information services department that provides policies, system design practices and operations policies. Second, Involvement, which encompasses user origination of systems, influence and appreciation. Third, use demographics specifically personality type, business history, social history and past experience. Forth, users' personal stake, for

example problem urgency. Fifth, system characteristics in terms of quality and ease of use. Six, decision style for example cognitive style. Seven, management in terms of action, support and managerial style. Eight. Organization support that ensures ease of access and finally, user performance. On the other hand, dependent variables which is implementation represented by frequencies of inquiries, reported use, monitored frequency of use and user satisfaction (Lucas, 2005).

Wilson (2002) notes, that the implementation phases of IT/ IS project are major part and it is when the largest expenditure occurs. Half the total project team hours may be used at this stage, and there will be large costs for hardware and software as well as training. This is also the stage at which major risks occur up to this point; there has been no interference with the basic procedures that the organization uses to conduct its affairs. But now operations will be transferred to the new system. Inevitably there will be a 'J-curve' effect where output dips during and immediately after the transfer.

Walton (1989) argues that there are five specific aspects that must be part of any IT development and deployment process they are: priority attention and commitment of resources; the process must be an extended one; the process must be inclusive; organizational values must be an integral part of the guiding factors; and technological and organizational aspects must develop in conjunction and parallel with the IT requirements. The first aspect indicated by Walton that is priority attention and commitment which is supported by Ward (1995) who holds the view that the IT development and deployment process is crucial to the effectiveness of the organization

and as such it warrants the direct attention and leadership of top management. Walton adds that this kind of leadership provides a distinctive dimension to the process and that is, the critical importance of commitment of organizational resources—not just fiscal resources, but those which are educational, and personnel related as well. Further, top management support and user involvement is key to process effectiveness but from the unique standpoint that it aids in the avoidance of resistance (Lucas, 1975). A second crucial factor is the life cycle of the IT development and deployment process. The process must extend beyond the development and implementation of ITs in the organization and it must ultimately continue through the evaluation and adjustment stages, as well. In the volatile area of IT, conditions change throughout the development and use of information systems. In addition to being extensive the implementation process.

The final two aspects which Walton speaks to deal with the value base and ongoing development of IT implementation. The process requires that a framework exist for its development. To be really effective this necessitates the infusion of organizational goals and missions into the process at the very beginning or planning stages. IT has such an impact on organizational outcomes that a clear understanding of the desired organizational effects of IT is crucial. As organization goals and directives are not static, neither are the requirements for ITs. As the organization develops its IT needs will change: the relationship between the organization and ITs is two-way and over time the two must develop consistently intertwined (ward, 1995). In addition, Lucas, (2005) says

an implementation strategy needs to take into account the crucial process issues in designing an information system as well as the factors that appear to influence success. System design can also be viewed as a planned change in activity in the organization. According to him a process implementation model has initiation, exploration, commitment, design, testing, installation, termination and operations stages.

The main phases of implementation are hardware purchase and installation and software purchase and writing. According to Wilson (2002) hardware purchase involves inviting suppliers to tender against the technical specifications while installation involves taking down ceiling panels and lifting floors to install communications cables. On the other hand, software purchase and writing calls for comparing and assessing the suitability of different packages. In the two stages technical conformance to the specification is obviously important, but the user-friendliness of the human-computer interface is extremely important. Gordon and Gordon (2004) note that once a system satisfactorily passes its acceptance tests, it can be moved into the production environment. IS professionals or other organization members must manage the transition from the old system to the new system. Companies generally use some combinations of the four implementation strategies as summarized in the table below. The proper strategy or combination of strategies for a given organization depends on the project, the amount of risk the organization can tolerate, the budget, characteristics of the target users, and the culture of the organization.



**Table 2.2: IT Implementation Strategies**

Strategy	Description	Time Required	Cost	Risk
Direct cut-over	Replaces old system with new system overnight	Minimal	Low	High
Pilot implementation	Uses the new system in one or more parts of the organization and later in entire company	Moderate	Moderate	Moderate
Phased Implementation	Introduces components of the new system one at a time	High	Moderate to High	Low
Parallel Implementation	Uses both the old and new systems simultaneously for a period of time	High	High	Low

**Source Gordon S. and Gordon J. (2004) Information Systems- A management Approach.**

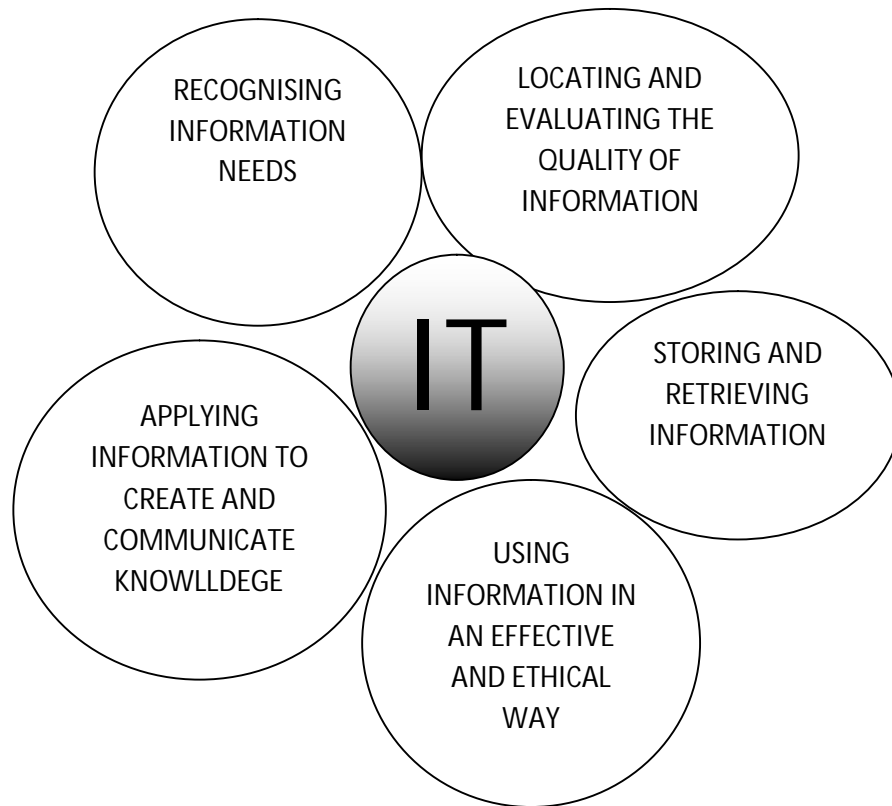
When the hardware and software for all the component sub-systems have been installed and tested, the whole system including all computerized and manual procedures must be tested to ensure it operates in an intergrated fashion. Before the new system can operate, the files of standing data used by the old system must be copied over to the new system.

Wherever possible a phased implementation should be adopted, with different sub-systems brought on-line one at a time. Another way to reduce the risks is to use a period of parallel operation as a safeguard to check that the new system is functioning correctly, before switching off the old system (Wilson, 2002).

#### **2.4.4 Information Technology Literacy**

Scholars such as Szewczak and Snodgrass (2002) say that individuals play an effective and important role in technology adoption process. A technology is not successful if its user does not accept it and in case of IT it is also true. Lack of user acceptance to technology has long been an impediment to the success of new technologies. Therefore, its understanding has been a high priority item for researchers and practitioner alike (Chau & Hu, 2002; Venkatesh & Davis, 2000). However, the cost of training is often underestimated at the IT formulating and implementing stage. This tends to happen because top management lack knowledge of the technology involved and therefore, underestimate the staff training required. Similarly, functional managers probably underestimate the cost because they have a vested interest in getting the project accepted. Technical staff in turn also underestimate training costs because being experts in the field they do not perceive the needs and difficulties of new users. Normally the best person to do the training is the individual's immediate supervisor as he or she will know how best, how long is required and the approach to take when instructing a particular individual (Cashmore and Lyall, 1991).

Information literacy is the capacity of people to recognize their information needs; locate and evaluate the quality of information; store and retrieve information; make effective and ethical use of information and apply information to create and communicate knowledge (Catts & Lau, 2008). In supporting this idea (Cashmore and Lyall, 1991) argue that training goal should be that not only are staff able to operate or use the new system but they are also willing to use it effectively. The easiest way to make staff willing is to involve them from the start in the development of the system so that they help to create it and therefore look upon it as their 'baby'. This definition is comprehensive because it entails all the information skills discussed above and most importantly highlights the power granted to the individual by being information literate. The figure 2.3 depicts the different aspects of information literacy contained in the above definition. It also represents an analogy: information literacy can be seen as a flower made up of several petals, where it will still be a flower even when some petals are missing, but will not be perfect.



**Fig.2.4: Different aspects of information literacy**

**Adapted from Catts and Lau, 2008**

The American Library Association as noted by Ala, (2010) lists competencies and skills to be associated with an information Literate person who is defined as a person who is able to recognize when information is needed and the ability to locate, evaluate, and use effectively the needed information. The Information literature persons are those who have learned how to determine the extent of information needed, access the needed information effectively and efficiently, evaluate information and its sources critically, incorporate selected information into ones knowledge, use information effectively to

accomplish a specific purpose, and understand the economic, legal and social surrounding the use of information.

Basing on this definition Wheelen and Hunger (2008) say a corporation that purchases an innovative technology must have the technological competence to make good use of it. Some companies that introduce the latest technology into their processes do not adequately assess the competence of their people to handle it. For example, a survey conducted in the United Kingdom in the 1980s found that 44% of all companies that started to use robots met with initial failure, and that 22% of those firms abandoned the use of robots altogether, mainly because of inadequate technological knowledge and skills. One U.S company built a new plant equipped with computer-intergrated manufacturing and statistical process controls, but the employees could not operate the equipment because 25% of them were illiterate.

Further, Chaffey and Woodstev (2005) argue that it would appear that many information-management-related projects fail to achieve the right balance between education and training. There is either insufficient training to be able to use new software tools correctly, or tools' training is available and there is insufficient education about the reason for using new software tools. Insufficient education and training is a common occurrence which leads to resistance to change and under-utilization of the new tools.

The lack of IT Literacy is demonstrated according to Mcleoad and Schell (2007) due to the fact that people know only the basics about their computers. As common as computers are in the workplace, most users have a poor understanding of the everyday

maintenance of the computer and its applications. It is extremely important for organizations to maintain their computers, because problem with one computer can quickly spread to others across the organization's network. Operating system can be thought of as a computer program that runs all the other programs on your computer. It has utilities, which are small programs that are able to copy files, install new application software, and arrange the desktop appearance of your computer and much more. Microsoft windows are the most popular operating system for microcomputers. Almost every manager or professional will use a windows operating system at some point in his or her career.

Many managers and professionals use the Microsoft office suite of products to complete their everyday tasks, since communication is an important task in all organizations. It is important to understand how the application software is identified with specific users and kept safe from threats (Mcleod & Schell, 2007). Managers and professional should also learn how to keep computers free of viruses and spyware. Viruses are created to destroy or steal information on your computer and cause your computer to become unusable. On the other hand, although spyware are not considered to be malicious too many spyware applications on a computer can slow its speed and performance. E-mail is so easy to use that people overlook its importance. Email is vital to business communications. Few users take advantage of all of their email applications features, thus they do not use email to its full potential.

#### **2.4.5 Information Technology Infrastructure**

IT is any computer-based tool that people use to work with information and support the information and information- processing needs of an organization. IT can be composed of the internet, a personal computer, a cell phone that can access the web, a personal digital assistant, or presentation software. There are two basic categories of information technology namely; hardware and software. Hardware consists of the physical devices associated with a computer system and software is the set of instructions that the hardware executes to carry out specific tasks (Phillips, 2009). IS facilities relates to organizational IS infrastructure. IS infrastructure is generally considered to be the foundation of shared IS capabilities that enable the development of IS applications and the support of business processes (Xia and King, 2004).

Hence, they defined IS infrastructure as a set of IS resources and organizational capabilities that are shared across the organization and that provide the foundation on which IS applications are developed and business processes are supported. Byrd and Turner ( 2005) provided a thorough definition of IT Infrastructure as “ the shared IT resources consisting of a technical physical base of hardware, software, communications technologies data and core applications and a human component of skills, expertise, competencies commitments, values, norms and knowledge that combine to create IT services that are typically unique to an organization. These IT services provide a foundation for communications interchange across the entire organization and for the development and implementation of present and future applications

Technology asset defined as computer and communications infrastructure that enables information that enables information sharing over standard IT platforms. According to Phillips (2009) Infrastructure architecture includes the hardware, software and telecommunications equipment that, when combined, provide the underlying foundation to support the organizations goals. The following are the five primary characteristics of a solid infrastructure architecture; flexibility, a system must be flexible enough to meet all types of business changes, scalability, refers to how well a system can adapt to increased demands, reliability, ensures all systems are functioning correctly and providing accurate information, availability, refers to a system or component that is continuously operational for a desirably long length of time, performance, measures how quickly a system performs a certain process or transaction. Not having enough performance capacity can have a devastating, negative impact on a business.

On the other hand, Cashmore and Lyall,( 1991) indicate that planning the infrastructure of an organizations' information system is becoming more and more important. As standards and open systems gradually become a reality organizations are switching away from a collection of specific applications which do not cohere and therefore do not form a rational organization-wide system. Adoption of information technology on Human Resource function cannot take place without the availability of technological assets which come in various forms. Karin (1994) notes that information Infrastructure must respond to the an institution's needs for easy information access, flexibility, smooth administration, reliability and security by first, maintaining the institution's information



repository spanning data, images, voices, and motion videos. Secondly providing access to the information via a standard user interface from a single workstation via onetime user identification and finally, providing tools that allow for identification and navigation through all information sources unconstrained by the information's origin.

Successful adoption and use of Information Technology calls for the introduction of a network, which provides efficient and convenient access to computing and information resources and facilitates the exchange of any type of information among various departments in organization. The computing environment of the modern organizations consists of a collection of serves linked to the network, where each server specializes in certain tasks. Examples of serves include telecommunications serves facilitating voice communication, multimedia serves providing access to training material, multimedia textbooks, and library materials, database servers maintaining the institution's dynamic data manipulated by administrative systems, documents serves for storing static information about the organization in either text or image, Electronic mail and / or fax servers (Karin,1994). On IT infrastructure needed in an organization Lussier, (2003) notes there is need to have an information networks which connect all employees from headquarters and remote facilities to each other, to suppliers and customers, and into databases. Further computer networks that connect independent computers so that they can function in interrelated ways. For example, First, Local Area Network (LAN) links everyone within one facility via computers. Second, Wide Area Network (WAN) link

employees in different facilities via computers using telephone lines or long-range communication devices.

Third, the use of firewalls, Intranets, and peer-to-peer. Many organizations do not want everyone to know about their activities and they also want to protect the privacy of their employees thus they use firewalls, software that limit access to unauthorized users. Intranets are networks that use internet technology, to provide access to some or all of the firm's employees. On the other hand, more computers on the internet are talking directly to one another. These direct links are known as peer-to-peer which is software that allows individual workers to collaborate on line however they want, without depending on tech people for help. The only peers who can tap into your shared spaces are those you specifically invite. What makes it different from LAN and WAN is that these systems use a central server while peer-to-peer software, the information is stored on the peer computers. Further, networks are commonly used to tap into databases such as online services that may provide access to the internet and its World Wide Web .According to Brown et al (2009) the internet has become a trusted channel for communicating directly with end-consumer and enabling other new ways for businesses to complete. These types of business and IT innovations have also catapulted management concerns to the agenda of top management teams and sometimes boards of directors as well. In the mid-1990s most companies just used the web to create a presence on the internet. But by the late 1990s companies began to use web technologies as a new channel to their consumers.

An excellent source for finding information related to human resource management is the internet. Today a growing number of HR managers are using the internet for numerous HR activities such as recruitment, training and networking with other colleagues. The information most useful for HR managers on the internet can be classified into two broad categories; 1) conversational resources and 2) reference resources. The first allows users to have conversations with individuals anywhere in the world. Regarding reference resources, two types can be distinguished 1) the World Wide Web and Gopher. The World Wide Web (www or web) uses hypertext language (HTML) to transfer text, sound, graphics or video. Gopher sites are usually maintained by government agencies and educational institutions (Grobler and Warnich, 2006). Ringler (2008) notes that businesses find themselves searching for the best way to increase their exposure on the internet, and for most a website is the first course of action. In addition, to the internet some organizations have adopted the use of telecommuters in their HR functions which are Portable computers and other mobile equipment that give them access to company data anytime and essentially everywhere. For large organizations with branches spread far and wide the use of virtual teams which are softwares that facilitates document sharing and online video-conferencing from the desktop or in specially equipped videoconferencing rooms.

According to Curtis and Cobham(2008) the software and technology used by an organization to develop web pages and to access them over the Internet is equally suitable for the development and access of web pages designed purely for consumption

by employees and clients of that organization. On one hand; intranet is an organizational network that operates over the internet. It connects people to people and people to information and knowledge within the organization, and also serves as an organization. Possible uses of the intranet include; providing leave status information, managing succession plan, providing electronic pay slips and containing an electronic handbook. (Grobler and Warnich, 2006). Businesses are using intranets for the internal display of company manuals covering employment and other procedures; easily updatable internal news and information services; company catalogues; and project notice boards to which project participants can add information and comments to be seen by all (Curtis and Cobham, 2008). Further, according to them intranets are replacing historical paper-based information systems because they are both cheaper and more easily updatable.

On the other the extranet is an internet-linked network that allows employees access to information provided by external entities. For example; with extranet, employees can access benefit information maintained by a third party benefits administrator. In addition, as noted by Curtis and Cobham (2008) extranet can be used to forge strategic links with trading partners and customers. The establishment of intranets and extranets within organizations has also enhanced communication. The impact of E-mail systems which permit rapid, asynchronous communication between workstations of a network, eliminating telephone tag cannot be underrated. Of course; there are potential drawbacks to e-mail communication. Because it is so easy to use, the volume of e-mail can become

overwhelming. Spam –unsolicited e-mail that most of us regard as junk is the bane of e-mail users. E-mail is also less personal because it is dependent on text signals alone. Some people use offensive words and phrases that they would never use in face to face conversation called “flaming” privacy issues arise because of the opportunity for electronic monitor by supervisors. For most organizations and most users, however these drawbacks are totally overshadowed by the advantages of rapid, asynchronous communication.

In relation to this new trend, Hodgetts and Hegar (2008) argue that managers are adapting their approach to meet emerging changes. Whereas managers once functioned in a resource-based organization, in which the company provided the necessary tools, equipment, and direction and the employees used these resources to pursue predetermined goals, today managers are operating in a knowledge-based organization, in which information sharing, teamwork, trust and empowerment are key characteristics. The basic question we need to ask is whether the employees are involved in determining the kind of technological assets required and the best way to utilize such assets. In summary Chaffey and Wood (2005) note that infrastructure also includes the architecture of the networks, hardware and software. Additionally, infrastructure can also be considered to include the data and documents accessed through e-business application. They argue that there are five layers of infrastructure that is; storage/ physical which can be equated to memory and disk hardware components, processing that is human and external interfaces and also the network, application/ content which is

the data processed by the application into information, intelligence which is additional computer-based logic that transforms information to knowledge.

In Africa, as noted by Ochieng (1998) compelled by competition and the drive to lower costs, organizations are investing in information technology systems infrastructure at unprecedented rates, integrating technology into a nearly all aspects of corporate operations. However, the World Bank Institute survey report say that “the average African university has bandwidth capacity equivalent to a broadband residential connection available in Europe, [and] pays 50 times more for their bandwidth than their educational counterparts in the rest of the world.” Another study carried out in 2005 for the African Virtual University (AVU) found that while most of the partner institutions either have an ICT policy in place or are developing one, they lack the resources to implement it. In agreeing with this Rodriguez (2008) notes that in general, Kenyan universities find it very expensive to establish and maintain the ICT infrastructure. This is demonstrated by the fact that Inter-institutional connectivity in higher education is because of KNET. However, Farrell (2007) notes that the lack of bandwidth access seriously constraints ICT use.

However as universities consider investing heavily in ICT infrastructure it is worth noting that the mismanagement of information technology investments can lead to lost opportunities and exposure to enormous business risk. As noted by O’Brien (1993) many companies have invested heavily but have failed to secure the full benefits

available, for example the U.S patent office spent \$ 289 million between 1984 to 1991 on information systems without deriving any benefits from investment.

#### **2.4.6 Improvement of Human Resource Function**

In developing countries, there has been some cases where ICT resources have been abundant but remained underutilization (Kaino; 2004, 2005). The issue of utilizing a fraction of the capacity of existing ICT facility in developing countries has been noted in past studies (Cawthera, 2002). Although IT adoption and utilization levels differ from country to country there are number of benefits associated with it not only in the Human Resource field but in all others. According to Phillips ( 2009) business functions receiving the greatest benefits from Information Technology are Customer Service- 70%, Finance- 51%, Sales and Marketing – 31%, Information Technology Operations- 39%, Operations Management- 31%, Human Resource – 17% and Security- 17%. Specifically, according to Gera and Gu (2004) found that ICT adoption and human resource management are complements; in other words, firm investment in a number of HRM practices was positively associated with ICT use. In this study the benefits associated with IT adoption are discussed under the following sub titles;

##### **2.4.6.1 Provision of Information and Knowledge**

Information which has been defined by George and Jones (2006) as data that are organized in a meaningful fashion can only be said to be useful if it has the attributes of quality, timeliness, completeness and relevance. First, they argue that for IT to work

well, the information that it provides must be of high quality. If managers conclude that the quality of information provided by the IT they use is low, they are likely to lose confidence in it and stop using it. Second, information that is timely is available when it is needed for managerial action, not after the decision has been made. Real-time information is frequently updated information that reflects current conditions. Third, information that is complete gives managers all the information they need to exercise control, achieve coordination, or make an effective decision. One of the functions information systems is to increase the completeness of the information that managers have at their disposal. Fourth, information that is relevant is useful and suits a manager's particular needs and circumstances. Given the massive amounts of information that managers are now exposed to and human's limited information-processing capabilities, the people who design Information Systems need to make sure that managers receive only relevant information.

Decisions are impossible without information with all the above attributes and managers are constantly seeking information to support their decision-making hence the growth of Information systems in this case Human Resource Information Systems. Mathis and Jackson (2003) explained HRIS as integrated system providing information used in HR decision making.” An HRIS serves two purposes in organizations:1) improves the efficiency with which data on employees and HR activities are compiled.2) having accessible data enables HR planning and managerial decisions making to be based to a greater degree on information rather than relying on managerial perceptions or intuitions. When an effective HRIS is implemented, perhaps the biggest advantage



gained is that HR personnel can concentrate more effectively on the firm's strategic direction instead of routine tasks. This can include forecasting personnel needs (especially for firms planning to expand, contract, or merge), planning for career and employee promotions, and evaluating the impact of the firm's policies. Both those related to HR functions, and other functions to help improve the firm's earnings and strategic direction (Scott and Bohlander, 2007).

In addition, as essential by-product of automation information refers to the provision of comprehensive HR-related knowledge. According to Wilson (2002) it is clear that knowledge workers cannot perform well in the secrecy and mistrust of a traditional command-and-control environment associated with personnel function hence the need to motivate them by giving them the problem and trust them with all the available information, then leave them to find a solution. Informed HRM promises advantages in the entire process of planning and controlling HR and therewith also a more strategic orientation of HRM (Kovach and Cathcart, 1999). IT can be viewed as a means of providing basic information to employees but it may also be asked to play a significant role in enhancing employment relationships. For example, the use of flextime and teleworking can increase employee commitment to the organization, aid in retaining quality employees, help employees balance work and family issues, and improve workplace performance (Wendy and Terry, 2010). From a social exchange lens, there are clear links between investment in human resources and the use of IT. Snell et al. (1995) believed that IT could not only provide employees with access to HRM-related

information but also reduce response time to some employee concerns and enhance service.

#### **2.4.6.2 Enhancing Internal and External Connectivity**

According to the policy Research Secretariat's Leadership network (2002): a network, like a system, is an interconnection of communicating entities. When applied to organizations, networking is about people who decide to come together with a sense of purpose; about the links they create from actual physical connections of wires, phones, and computers to the back and forth of communication to trusting relationships; and about collaborating within a flexible timeframe. Quoting from the volume I of African Universities in the 21<sup>st</sup> century book on Liberalisation and Internationalisation Mary (2000), former head of leadership network in Canada summarizes the benefits of networking as follows;

“Networking is becoming a technique of choice in the public service to meet the demands of the external environment- transition to the knowledge economy, globalization, technological innovation, shifts in the social fabric and citizen expectations- while meeting the challenges of making policy in an era when issues are more complex, multi-disciplinary and global in scope, and where the single department- or even the government itself- hasn't a monopoly on solutions. Networks get people talking, promoting collaboration and cross pollination between disciplines, policy area, and service delivery methods. Networking facilitates knowledge exchange that leads to less duplication of effort making it possible for a wider overall impact. Networking can

provide the critical mass for local, national, and international advocacy of policy change and action.”

Further, Lussier (2003) says that with information networks which connect all employees from headquarters and remote facilities to each other, to suppliers and customers, and into databases it is no longer necessary to have all employees in one facility. In addition, with internal computer networks, employees in an organization have direct access to each other and to the information they need to do their work. All employees can do their jobs in a more informed and efficient manner by using the shared databases and by having direct contact with others. IT improves collaboration which is refers to the networking of spatially segregated actors in a given field for example in HRM, such as HR professionals, line managers, employees, applicants, or consultants among others. Collaborated HRM promises advantages through coordination of scattered HR actors and therewith also innovative forms of organizing HRM (Lepak and Snell, 1998).

According to Metropolitan State University (2004) Team collaborations would certainly be characterized as a best business practice today. Of course, teams in the business world are often composed of more than two people with many being spread all over the globe, and that’s why IT technology plays such an important role in team collaboration. Collaborative-enabling technologies such as chat rooms and the internet in general are fundamental to the success of a team. All of these technology based tools and many more enable teams to work effectively, even when team members are geographically dispersed. The school of Management in Metropolitan State university MIS curriculum

developed in 2004 notes that because of technology, one can now have the ability to market your products and services in countries all over the world and develop partnerships and alliances with other businesses thought out the globe. Further a business can gain significant advantages by enabling global reach through technologies by acquiring cheaper and larger workforce.

#### **2.4.6.3 Cost Reduction and Improved Efficiency**

It is argued by Jones and George (2006) indicate that the rapid advances in IT have been associated with a “delayering” (flattening) of the organizational hierarchy and a move toward greater decentralization and horizontal information flows within organizations. By electronically providing managers with high quality, timely, relevant and relatively complete information, modern management Information Systems have reduced the need for tall management hierarchies. Modern information systems have reduced the need for a hierarchy to function as a means of controlling the activities of the organization. In addition, they have reduced the need for a management hierarchy to coordinate organizational activities. Scott and Bohlandern (2007) noted that information technology, of course, changed the face of HRM in the United States and abroad. Perhaps the most central use of technology in HRM is an organization’s Human Resources Information System (HRIS).

The most obvious impact has been operational, that is, automating routine activities, alleviating administrative burdens, reducing costs, and improving productivity internal to the HR function itself. The initial drive to adopt (HRIS) was related to cutting HR costs. But HR managers have since discovered that the systems have allowed them to

share information with line managers, who, by having access to it, have been able to come up with better production practices and cost control solutions. As a result, HR managers are now asking their application providers to develop additional software to meet certain goals, such as lowering a company's total spending on employee healthcare and improving customer service. As automated production, automated HRM promises advantages in costs, time, and quality of HR processes and therewith a liberation of HRM (Shrivastava and Shaw, 2003).

In agreeing with (Lusthaus, 2000), scholars including Grobler and Warnich ( 2006) say one of the most significant issues faced by modern organizations is the use of technology to streamline activities, cut costs and increase business effectiveness. According to Wilson A.(1996) information technology is the most powerful labour-and time-saver ever developed, and the management of knowledge depends heavily on it. Often the most obvious benefit, an information system can save costs, by, for example, automating processes which people have previously done more slowly and expensively, more accurate and timely distribution of work among others. A major benefit is the ability of a computer-based system to reduce errors when it replaces a manual system. While people can provide a personal and flexible service, they can also make mistakes and act inconsistently (Boddy,et al,2002).

A modern information system can save an organization from a future increase in costs, lead to prospects of increased sales through offering new services, delivery channels, promotional activities, or market penetration. Further to remain in business in a highly

regulated environment, it may be necessary to be able to operate in a certain manner just to be allowed to continue to provide the service (Boddy,et al,2002). The school of Management in Metropolitan State University MIS curriculum developed in 2004 indicates that the original and still fundamental role of IT is to increase productivity. In short, because of its great speed and ability to store and process massive amounts of information accurately, IT can greatly reduce the time, errors and costs associated with the processing information in a variety of ways.

#### **2.4.6.4 Competitive Advantage**

State-of-the-art IT can improve the competitiveness of an organization. Indeed, the search for competitive advantage is driving much of the rapid development and adoption of IT Systems. By improving the decision making capability of managers, for example, MIS like executive support system and decision making support system should help an organization enhance its competitive position. Similarly, by reducing the need for hierarchy, modern Information Systems can directly increase an organization's efficiency. One reason for an increase in efficiency is that the use of advances information systems can reduce the number of employees required to perform organizational activities (Jones and George, 2006). Some of the benefits associated with IT adoption are intangibles and can be summarized as follows in the table 2.3 below.

**Table 2.3: Cost Benefits of Information Technology Adoption**

<b>POSSIBLE IMPROVEMENTS IN</b>	<b>DESCRIPTION</b>
Communications	Between staff, suppliers, distributors, customers or investors
Staff Morale	Staff may see improvements in their role or working environment
Reputation	New systems may send positive signals to the market about commitment to innovation
Knowledge Management	Use of customer data in advanced IS may improve reaction to customer needs
Value chain management	Building partners in the value chain can simplify purchasing, reduce stock costs and speed invoicing
Flexibility	IS often enable an organization to react more quickly and easily to changes in the marketplace
Organisational learning	IS enables learning on current practices, external events and new developments.
Differentiation	Enable differencing of our organization's services and products from the rest.

Source: Kaplan and Norton, 1996

Although Information Technology is becoming more reliable, faster, and less expensive, the costs, complexities, and risks of IT projects continue to increase. One of the limitations of IT in organizations is that despite its many advantages there are still technological problems to be overcome. One of these is the lack of consistent

technological standards throughout the divisions or functions of an organization. If a company uses different kinds of software systems, made by different IT companies that impede communication and decision making. Another serious potential problem is that in all of the enthusiasm for management Information Systems, electronic communication by means of a computer network, and the like, a vital human element of communication might be lost. Some kinds of information cannot be aggregated and summarized on an MIS report (Jones and George, 2006).

However, according to them this shortcoming can be overcome if managers can take several steps to make it easier and quicker to implement an MIS. First, they have to develop a list of the organizations principal goals and then decide on the major types of information they need to collect to measure how well they are achieving those goals. Second, while making this analysis, managers should audit their current MIS's to determine the degree to which the information they are currently collecting is accurate, reliable, timely, and relevant. Thirdly, managers need to investigate what other sources of information might be available to measure and improve efficiency, quality, innovation, and responsiveness to customers. Fourth, when this analysis is complete managers need to build support for the introduction of an advanced MIs and convince employees that the system will help raise job and organizational performance.

Fifth, managers should create formal training programs, with appropriate backup support, to help train employees to use the new system and technology, making sure that the system is as user friendly as possible. Sixth, managers should emphasize the MIS is



not a substitute for face-to-face communication and that employees at all levels should be involved in a continuing discussion about how best to take advantage of ongoing developments in IT to create competitive advantage.

## **2.5 Critique of Empirical Studies**

Since the shift from personnel Management to Human Resource Management a lot of transformation has taken place to make this key department in organizations proactive, strategic and innovative. In the current information age Information technology has played a pivotal role in ensuring the Human Resource department achieves its objectives. Recent studies note that the Human Resource Management (HRM) has recently turned its concentration on knowledge sharing and strategic workforce analysis and has been increasingly evolving into a significant contributor on the organizational strategic management ( Rodriguez and Ventura, 2003; Troshani et al.2011). Further, Tsubira & Mulira (2005) argue that the integration of ICT in organizational functions read human resource function has brought about increased efficiency, cost effectiveness, and competitiveness.

This is partially attributed to technologies enablers, such as Human Resource Information Systems (HRIS) which consists of systematic procedures and functions to acquire, store, retrieve, analyze, manipulate and disseminate relevant information concerning organizational Human Resources ( Lippert and Swiercz, 2005; Troshani et al. 2011). According, Lengnick-Hall and Moritz (2003) have argued that HRIS will be

implemented at three different levels; the publishing of information; the automation of transactions; and finally, a change in the way Human Resource Management is conducted in the organization by transforming HR into a strategic partner with the line business. In their view, the evolution of HR is promoted by HRIS evolves from information to automation and from automation to transformation. They note that while HRIS has been widely deployed, a transformation of Human Resource Management has occurred in relatively few organizations.

The situation in most of the organizations within the developing countries is that the benefits of ICT have not been fully exploited. This is also in the institutions of higher learning such as Kenyan Public Universities. Previous studies such as Wanyembi (2002) note though there is clear evidence that ICT is being utilized to support the universities mission of learning, teaching, research and for administrative purposes, the establishment of ICT departments in the public universities and introduction of ICT related courses within their programs, it is yet to be utilized fully and successfully. In agreeing with this a study by Bii and Mugo, (2006) pointed out that an institution of higher learning research and scholarship which is widely expected to be a torch bearer in the use of ICT for creation, processing, storage, retrieval, and dissemination of information has not succeeded in this noble endeavor. In addition, they pointed out that the adoption and utilization of ICT at Moi University, and indeed in Kenya's public universities, is at its infancy. They noted that these technologies have not been fully and successfully adopted in Kenya due to a variety of impediments.

The success of technologies enablers such as HRIS is pegged on how well we understand the factors behind adoption of Information Technology. Various studies have been undertaken by previous scholars to try and bring out the factors that are critical to the adoption of Information Technology. It is worth noting although most the studies were not conducted in Kenya and within the Human Resource Function the outcome of these previous studies have a major contribution to this study. Though the researcher appreciates there are many factors that influence adoption of IT the focus of this study is on Information Technology Policy Framework, proper IT Implementation Procedures, IT Literacy and IT Infrastructure as key contributors to the adoption of Information Technology.

Previous studies on IT Policy Framework appear to give contradicting positions on existence of IT Policy Framework in Kenyan Public Universities. On one hand some studies indicate that organizations have well documented IT Policy Framework the only missing link is the implementation of the policies. According to Farrell (2007) Kenya has a sophisticated ICT in Education Strategy and implementation plan. It is embedded in the national ICT policy and was developed through consultative process with stakeholders. The plan has cost estimates, timelines with measureable outcomes, and specified lead agencies. On the other hand they are those who think Kenyan Public Universities lack IT Policies and those that exist are not good enough. For example Nyandiere ( 2007) notes in his study that one of the challenges of ICT utilization in higher education is lack of clear policies and management framework for acquisition

and replacement of hardware, software purchases and licensing, security of ICT resources, ongoing assessments of new technology.

In addition, according to Katundu (2000) one of the impediments in IT adoption is the failure to prioritize the information sector and its contribution to national development in the developing countries which has led to lack of funding and information policies in all sectors of their economy, including higher Educational institutions. Further, this adoption and utilization is definitely not the result of a strategic information policy plan. In agreeing with this state of affairs Rodrigues (2008) point out that most Kenyan universities have not yet developed comprehensive ICT policies and strategies. He adds that universities have not yet addressed security issues fully and neither do they have operational IT security policies. However on the contrary Farrell (2007) in agreeing with Wanyembi (2002) says that each university in Kenya has developed its own ICT policy.

On IT Implementation procedure recent studies have also indicated the lack of proper implementation procedures. According to Wanyembi (2002) IT Implementation procedures in Kenyan Public Universities appear to be disjointed and disorganized and further notes the manner in which ICT was introduced was initially piecemeal, uncoordinated, and in most cases haphazard. Tsubira & Mulira (2005) say integration of ICT in an organizations function is a complex process which needs to be fully conceptualized and defined before implementation to avoid dissipation of resources through implementation of unrelated or uncoordinated projects.

Concerning IT Literacy there appears to be a consensus that there is inadequacy in the level of IT Literacy skills among ICT end-users. Chacha (2005) notes, ICT training in higher educational institutions in Africa that there has been insufficient training and re-skilling of end users as well as technical staff that support the systems in higher educational institutions in Kenya. Wheelen and Hunger (2008) note in a study the implementation of any form of Technology is abandoned mainly because of inadequate technological knowledge and skills. The ICT Plans of the ministry of Higher Education in Kenya recognize a current deficit in terms of HR capacity to lead and support the implementation of the plan. Kemei (2003) notes that training needs of the various categories of ICT users are yet to be established. He suggests that the relevance of training as well as the reality of the fast-changing technology must be considered if such assessments are to be effectively undertaken. Although this is the case there has been documentary evidence gathered from the mid 1980's to date, several ICT consultancy firms, both local and foreign, were contracted to give training to ICT staff at public universities in Kenya (wanyembi, 2002).

Surprisingly, most of the training tasks were not completed, and the few that were, were poorly done and left the intended users and technical staff with few ICT skills despite the fact that the firms were often fully paid for the work. The lack of a strong legal system in Kenya means that such firms often get away without being held accountable. On the other hand, the foreign ICT companies are usually more expensive than the local ones and they lack knowledge of the local conditions. Due to the high costs involved, the periods of contract periods are often reduced. This leaves the recipient institutions with

uncontained and unresolved problems and instead the problems keep growing and threaten to get out of hand (Wanyembi, 2002). The quality and efficiency of ICT application in Kenya can only be achieved by means of capacity building through research and development, which are elements of information skills (Kandiri, 2006).

In relation to IT Infrastructure, many studies have shown that IS facilities are influential in determining the success of IS adoption and implementation Ang C.L. et al. (2001), Hussein R. (2004). Katz (2001) argues that the ICT Infrastructure is likely to influence and even shape the nature of higher education institutions and the practices of faculty and administrators. He further says information resources and tools can be invoked to help guide increasingly complex and consequential institutional decisions through tool provided by the systems. In addition Chacha (2004) notes one of the key challenges of higher educational institutions as being lack of ICT capacity and utilization in the running of the institutions. Later, Chacha (2005) notes that an appropriate IT Infrastructure has the capability to adapt rapidly to environmental and technical changes in business world.

Further, Chung (2005) IT Infrastructure is fundamental for all business functions and business processes within the organization. The organizations IT infrastructure primarily deals with the integration of technology components to support business needs. The organization's competitiveness depends on the flexibility of the IT Infrastructure, because the infrastructure allows the company to quickly develop new processes and applications. The speed with which an organization can implement those processes and applications improve its competitiveness in the market. The results of the study show

that the components of IT Infrastructure flexibility impact strategic IT-business alignment and the extent of applications implementation in the organization. Teuta (2003) the decisions on whether or not to adopt internet-based applications is affected by a number of factors, which are related to the infrastructure that organizations have built, and organizational factors. The world Bank Survey (2005) summarizes this by noting that the state of ICT Infrastructure in African Universities are too little, too expensive and poorly managed.

## **2.6 Research Gap**

In view of the developed theories and past studies it can be deduced that for Information Technology to be adopted successfully within an organization there is need to consider the factors behind the adoption. The kind of Technology, users of technology, context of technology adoption, expected outcome of using technology are some of this key considerations. It is from this basis that the variables under investigation in this study namely information technology policy frameworks, IT implementation procedures, IT literacy and IT Infrastructure were picked as key determinants in adoption of IT in Human Resource Management function.

The gap identified in research that this study aimed at filling is that apart from previous studies on adoption of technology indicated above being in other areas not in Human Resource Function there is none that has looked at all these factors under a single study. Secondly, although some of the studies have been carried out in developing countries such as Malaysia it will be suicidal to imagine that it applies in totality in another

country such as Kenya. Thirdly, as much as some of the studies are confined within the public sector none has considered public universities which are the focus area of this study.

Finally, In the theory adopted for this study that is the Unified Theory of Acceptance and Use of Technology (UTAUT) it highlights the variables that influence the behavior to either intent to use Technology or usage of technology namely performance expectancy, effort expectancy, social influence and facilitating conditions. However, it does not discuss the constructs under each of these variables. In trying to improve this theory this study proposed to investigate further the possible facilitating conditions that influence the use of technology. In particular, the study questioned the role played by IT policy, IT implementation procedures, IT Literacy and IT Infrastructure in the usage of Information Technology in Human Resource function.



## **CHAPTER THREE**

### **3.0 RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter discusses the methodology adopted by the study to carry out the research. The study aimed at examining the factors to be considered in adopting Information Technology in Human Resource Function in Public Universities in Kenya. This chapter describes the research design, the study area, the population of the study, the sampling procedure, methods of data collection, reliability and validity of the instrument and finally data analysis techniques.

#### **3.2 Research Design**

A research design according to Kothari (2004) is a conceptual structure within which research would be conducted aimed at providing for the collection of relevant evidence with minimal expenditure of effort, time and money. Creswell (2009) defines research designs as plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis. The study used descriptive survey research design which according to Easterby-Smith et.al, (2008) is aimed at establishing relationships between variables and concepts, whether there are prior assumptions and hypotheses regarding the nature of these relationships. This research design was justified as it enabled the researcher to determine the current status

of the population by assessing their attitudes and opinions with respect to the four variables under investigation.

### **3.3 Target Population**

The target population was drawn from the seven Kenyan public universities which were listed in the latest edition as per 2011 of public universities in Kenya provided by the Kenya commission of higher education indicated in appendix III. Consequently, the respondents for this study were all employees working in the Human Resource function in the seven Kenyan public universities at the time of the study.

### **3.4 Sampling and Sample Size**

The sample size of 123 respondents was derived from the target population of 180 in the Human Resource Department employees within the seven public universities. The sample size was derived as shown in the table below basing on a table for determining Sample size for a given population size generated by Bartlet, Kortrijk and Higgins (2001) as shown in appendix IV. This can also be compared to the formula by Mugenda and Mugenda (2003). Since the study population is less than 10, 000, the total sample size was determined by use of Mugenda and Mugenda (2003) as effective for social sciences, for samples less than 10,000.

Where;

$n$  = the desired sample size for target population <10,000,

$Z$  = normal standard deviation corresponding to 95% confidence interval, that is 1.96,

$P$  = Proportion of the population estimated to have desired characteristics.

$D$ =Design effect (2)

Hence;

$$n = \frac{z^2 pq}{d^2} = \frac{1.96^2 * 0.5 * 0.5}{0.05^2} = 384$$

Therefore the desired sample size  $nf$  for populations less than 10,000 is as shown below.

$$nf = \frac{n}{1 + \frac{n}{N}} = \frac{384}{1 + \frac{384}{180}} = 122.6 \cong 123$$

Where  $nf$  = expected sample size

$N$  = population of the study.

$n$  = expected sample size for populations of more than 10,000

**Table 3.1: Population size and sample size**

<b>UNIVERSITY</b>	<b>HR EMPLOYEES POPULATION SIZE</b>	<b>HR EMPLOYEES SAMPLE SIZE</b>
University of Nairobi	26	19
Kenyatta University	26	19
Moi University	26	19
Egerton University	26	19
JKUAT	26	19
Maseno University	25	14
MMUST	25	14
<b>TOTAL</b>	<b>180</b>	<b>123</b>

Purposive sampling was used to pick all the seven registrars in the seven public universities in-charge of administration who are equivalents of Human Resource Directors and seven senior assistant registrars who can be equated to Human Resource managers giving as a total of 14. This was done as the two sets of respondents were

considered to be playing key roles in strategic decisions affecting the HR function. The remaining 109 respondents were selected using simple random sampling from the rest of HR function staff.

### **3.5 Research Instruments**

The researcher used the questionnaire as the main data collection instrument which was seen as most recommended tool of data collection when you are dealing with a large sample. Kumar (2005) notes, that questionnaires are less expensive since one saves time, human and financial resources and convenient. The questionnaire was prepared after translating and adopting constructs from previous related studies and divided them into seven sections: Section A aimed at collected Bio-Data of the respondents necessary for the study. This is followed by Section B that addresses the level of IT utilization HR function activities. Further, this was followed by Section C to Section F that focuses on the critical factors in adoption of information technology IT Policy framework, IT Implementation procedure, IT Literacy and IT Infrastructure respectively and section G on Improvement in HR Function due to IT Adoption. Mostly the questions requiring responses on a 5-point likert-type scale were used.

### **3.6 Data Collection Procedures**

The researcher used three experienced research assistants to assist in data collection. The research assistants were taken through a two day long training on how to use the instruments. After the two days training assistants were tested orally to ascertain whether

they had grasped the concepts under investigation. The researcher wrote and in some instances spoke to the management of the public universities to be allowed to collect data and after seeking authority data was collected in three stages as follows. First, the researcher and research assistants administered questionnaires to JKUAT, KU and Nairobi University staff and collected the questionnaires within a period of two weeks. Second, the researcher and research assistants administered questionnaires to Egerton and Moi University staff and collected them on the agreed date within two weeks. Finally, the researcher and research assistants administered questionnaires to Maseno and MMUST University staff and collected within the agreed two weeks period and after two months of data collection scoring took place and then analysis was done.

### **3.7 Pilot Study**

A pilot study that helps to detect weaknesses in design and instrumentation and to provide proxy data for selection of a probability sample (Nachmias and Nachmias, 2008) was conducted. Since the respondents of the pilot test do not have to be statistically selected (Nicholas, 2008) four respondents were randomly picked from one of the constituent colleges of each of the seven Kenyan public universities. The instruments were pre-tested with 28 HR function employees within seven constitute colleges. The effected changes in the questionnaire included the reduction of working experience gap from 5 years to 3 years in each category. Further a section asking about areas of adoption of IT in HR Function was moved from the dependent variable section to just after demographic data. Finally the dependent variable was changed from expected

improvement of HR Function to Improvement of HR Function. The instruments were administered to the same group of respondents after a period of one month after these modifications were made and approved for final administration of the instrument.

On the other hand in enhancing validity and reliability of the data collection instrument, an extensive review of the literature was conducted to ensure that the variables subscales are based upon established concepts. Second, the instrument was reviewed by a panel of lecturers and consultants in human resource management related matters. According to Weiers (1988) judgment of experts regarding the representatives of the instrument is often a source of constructive input and suggestions for getting the instrument better aimed in the direction of the characteristic we are attempting to measure.

Further, Cronbach's Alpha coefficient was used with the help of the SPSS program to measure reliability. According to Santos and Haubrich (1999) if the coefficient is more than 0.73 the data collection instrument is taken as reliable but if it is below, the instrument is treated unreliable. The research instrument was justified to be used for collecting data because the Cronbach Alpha coefficient was 0.811. These correlations were considered adequate since other researchers generally recommend values of  $r = .80$ , or larger as ideal when using correlation to measure the reliability of measurement (Gravetter & Forzano, 2009). Finally, factor analysis was also done to identify factors that explain a variety of results on different tests which according to Ledesma and Valero-Mora (2007) has the advantage of ensuring both objective and subjective attributes can be used provided the subjective attributes can be converted into scores,

used to identify dimensions or constructs which may not be apparent from direct analysis among many others.

### **3.8 Data Analysis and Measurement of Variables**

First, Descriptive information after content analysis was converted into frequencies and percentages and presented using tables and pie-charts. Specifically, frequencies and percentages were tabulated for each section of the questionnaire. The first section of the questionnaire provided data on demographics, the second section to the fourth section provided data for each of the independent variables and the fifth on activities within the Human Resource Function that IT has been adopted and the sixth section provided data for the dependent variable.

Second, the study aimed at establishing the associations between the independent variables and dependent variable hence the need to undertake correlation analysis. Gray (2009) notes that when an association is measured numerically, we get a correlation coefficient that gives the strength and the direction of the relationship between two variables. In addition to the strength of a relationship, we might also be interested in the direction of an association such as positive or negative.

Pearson correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a



negative linear sense and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (Sekeran, 2008 & Kothari, 2004). In this case each of the independent variables: IT policy, IT implementation procedure, IT literacy and IT infrastructure and the dependent variable; was correlated with the dependent variable; Improvement of Human Resource Function using Pearson correlation coefficient.

Tests for significance that is t-test and F-test were used to test the significance of the independent variables and the dependent variable. For the Hypotheses to be accepted or rejected comparison was done between the critical t and calculated. If the calculated t was greater than the critical t, then alternative hypothesis was accepted (Shenoy & Madam, 1994).

In addition, Analysis of Variance (ANOVA) test was done to analyze the amount of variation within each of the sample relative to the amount of variation between samples this was considered important since it makes use of the F-test in terms of sums of squares effects over sums of squares residual (Sekeran, 2008 and Herbert, 2011). Finally, Multiple Linear Regression analysis was used to analyze first the effect of each independent variable on the dependent variable and secondly the overall effect of the independent variables (IT policy, IT implementation procedure, IT literacy and IT infrastructure) and the dependent variable (Improvement of Human Resource Function).

In particular, Snelgar et al., (2012) argues that Multiple Linear Regression is important where we predict one variable on the basis of several other variables, particularly they say that the method is also suitable when predictor variables that you select should be measured on a ratio, interval, or ordinal scale. Further, they note that more than one predictor variable is useful when predicting human behaviour, as our actions, thoughts and emotions are all likely to be influenced by some combination of several factors. Given the nature of our data this method was considered most suitable. In order to be able to use Multiple Linear Regression analysis, having in mind that the data collected with the questionnaire was on a likert scale and the individual responses were principally ordinal, it was imperative to transform the study variables so that when running the regression the assumptions of parametric measures can be met.

Transformation of variables was effected by weighting and summing the responses under each variable. This meant that all the responses for statements under each section of the questionnaire were weighted and summed so that each section is treated as one (1) item in running statistical analyses. The transformed variables were indexed as follows: IT Policy Framework, IT Implementation Procedure, IT Literacy, IT Infrastructure, and Improvement of HR Function. The first four variables represented the independent variable, and the last one represented the dependent variable. The regression analysis was then run with Improvement of Human Resource Function being the dependent variable and IT Policy Framework, IT Implementation Procedure, IT Literacy and IT Infrastructure, representing the independent variables as defined.

Specifically, Multiple Linear Regression analysis is a statistical technique that models the relationship between a criterion or dependent variable ( $Y$ ) and a set of predictors or independent variables ( $X_i$ ) (for  $i = 1, 2, 3, 4$ ). This statistical relationship is of the form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where,  $Y$  = Improvement of HR Function

$\beta_0$  = *intercept*

$\beta_1 - \beta_4$  = Slopes coefficients representing the influences of the association Independent variables over the dependent Variable.

$X_1$  = IT Policy Framework

$X_2$  = IT Implementation Procedure

$X_3$  = IT Literacy

$X_4$  = IT Infrastructure

$\varepsilon$  = Error term

It should be noted that the  $\beta_1, \beta_2, \beta_3, \beta_4$  represent the independent contribution of each independent variable to the overall model where  $\beta_0$  represents the intercept of the linear model. Further, the general objective of the study which was to analyze the effect of the determinants in adoption of Information Technology in Improving Human Resource Function was also analyzed using Multiple Linear Regression method to assess the overall effect of the independent variables on the dependent variables.

## **CHAPTER FOUR**

### **4.0 PRESENTATION OF FINDINGS AND DISCUSSIONS**

#### **4.1 Introduction**

This chapter contains findings of the study on the determinants in adoption of information technology for improving Human Resource Function in Kenyan public universities. Descriptive and inferential statistics were used to analyze the data. On one hand, frequencies and percentages were used to analyze data descriptively. Further inferential statistical analysis was conducted for the purposes of testing hypothesis and predicting relationship between dependent and independent variables.

#### **4.2 Response Rate**

A total of 123 respondents drawn from the HR function in the seven public universities in Kenya were sampled. Moi University, JKUAT and Maseno had the highest response rate of 100%, while Egerton and University of Nairobi had a response rate of 95%, MMUST response rate of 93% and finally Kenyatta University had the lowest response rate of 89%. Table 4.1 below indicates the questionnaires were reduced to 118 after five questionnaires were dropped from the analysis because they were not returned giving an overall response rate of 96%. This was considered adequate for further analysis since according to researchers such as Mugenda (2008) a response rate of over 60% is considered good adequate for analysis.

**Table 4.1 Response Rate**

UNIVERSITY	HR EMPLOYEES SAMPLE SIZE	RETURNED QUESTIONNAIRES	Response Rate %
University of Nairobi	19	18	95
Kenyatta University	19	17	89
Moi University	19	19	100
Egerton University	19	18	95
JKUAT	19	19	100
Maseno University	14	14	100
MMUST	14	13	93
<b>TOTAL</b>	<b>123</b>	<b>118</b>	<b>96</b>

#### **4.3 Reliability and Validity before Factor Analysis**

In this study Cronbach's Alpha coefficient was used to measure reliability. According to Santos and Haubrich (1999) if the coefficient is more than 0.73 the data is taken as reliable but if it is below, the data is treated unreliable. The data was justified to be used for further analysis because the Cronbach Alpha coefficient was more than 0.80 as indicated in the table 4.2. These correlations were considered adequate since other researchers such as Gravetter & Forzano, (2009) generally recommend values of  $r = .80$ , or larger as ideal when using correlation to measure the reliability of measurement.

**Table 4.2: Reliability and Validity Measurement Results**

Constructs	Number of Items	Cronbachs Alpha
<i>Independent variables</i>		
IT Policy Framework	10	0.806
IT Implementation Procedure	10	0.896
IT Literacy	9	0.870
IT Infrastructure	8	0.817
<i>Dependent variable</i>		
Improvement in Human Resource Function	10	0.826

#### **4.4 Factor Analysis of Independent and Dependent Variables**

Factor analysis was conducted after reliability to ensure that all the questions on all the respective variables were relevant for consideration or not. In this case confirmatory factor analysis was done was used in which questions that had factor loadings of more than 0.4 were retained (Field, 2009). The following section presents component matrix tables indicating items from the questionnaire for both independent and dependent variables.

#### 4.4.1 Improvement of Human Resource Function

The independent variable which was improvement of Human Resource function had a total of 10 questions and all the items in the variable were confirmed valid since their factor loadings values were more than 0.4.

**Table 4.3 Component Matrix for Improvement of Human Resource Function**

---

	Component 1
1. IT adoption has lead to Rapid response leading to faster decision making	.804
2. IT adoption has lead to Improvement of quality	.728
3. IT adoption has lead to Global market connection	.688
4. IT adoption has lead to Improved knowledge base	.683
5. IT adoption has lead to Streamlining of HR activities	.682
6. IT adoption has lead to Easier communication	.657
7. IT adoption has lead to Labour and time saving	.627
8. IT adoption has lead to Easy connectivity with other departments	.526
9. IT adoption has lead to Increased HR function effectiveness	.471
10. IT adoption has lead to reduction of running HR function cost	.421
Extraction Method: Principal Component Analysis.	
1 component extracted.	

---

#### 4.4.2 IT Policy Framework

The IT Policy Framework independent variable had a total of ten questions in which eight questions were confirmed valid while two questions that is whether the

respondents were aware of an IT Policy and whether an IT Policy existed were excluded from subsequent analysis since they had a factor loading of below 0.4.

**Table 4.4 Component Matrix for IT Policy Framework**

	Component
	1
1. enforcement procedures in case of inappropriate use	.949
2. rules on in use of personal computers on the network	.870
3. Indication for further development of IT	.845
4. IT policies sets parameters for Appropriate use	.827
5. proper authorization to access IT systems	.779
6. IT policy indicates ways of repairing and maintenance	.722
7. adequacy of IT policy	.483
8. Applies to all users	.443
9. awareness of IT policy	-.147
10. existence of IT policy	.020
Extraction Method: Principal Component Analysis.	
1 component extracted.	



#### 4.4.3 IT Implementation Procedure

The IT Implementation Procedure independent variable had a total of ten questions in which all the questions were confirmed valid for subsequent analysis as they had a factor loading above 0.4.

**Table 4.5 Component Matrix for IT Implementation Procedure**

---

	Component 1
1. Implementation of IT is an all inclusive exercise	.914
2. Management committing organizational resources	.866
3. HR employee have a duty to manage IT systems	.810
4. introduction of it systems is well planned and organized	.805
5. Implementation of IT has measurable objectives	.783
6. Top management support	.773
7. Implementation of IT is in line with organizational goals	.696
8. Clear timeline with completion targets	.683
9. Procedures in introduction of IT systems	.455
10. changing from manual to IT systems	.409
Extraction Method: Principal Component Analysis.	
1 component extracted.	

---

#### 4.4.4 IT Literacy

The IT Literacy independent variable had a total of nine questions in which seven questions were confirmed valid while two questions that are whether the organization's management had circulated IT manual and organized IT training were excluded from subsequent analysis since they had a factor loading of below 0.4.

**Table 4.6 Component Matrix for IT Literacy**

	Component
	1
1. confidence in selecting appropriate IT technology	.915
2. confidence in use of IT skills in HR	.884
3. level of IT literacy is sufficient	.844
4. Confidence in necessary skills to use IT in HR	.832
5. confidence in carrying out HR activities using IT	.824
6. HR employees have undergone IT training without assistance	.773
7. confidence in helping other employees to solve IT problems	.660
8. The organization's management has circulated IT manuals	.309
9. The organization's management has organized IT training	.243

Extraction Method: Principal Component Analysis.

1 component extracted.

#### **4.4.5 IT Infrastructure**

The IT Infrastructure independent variable had a total of eight questions in which all the questions were confirmed valid for subsequent analysis as they had a factor loading above 0.4.

**Table 4.7 Component Matrix for IT Infrastructure**

	Component 1
1. Availability of IT documents systems	.833
2. Availability of IT data base system	.811
3. Availability of IT multimedia systems	.763
4. Availability of electronic mail and/or fax servers	.749
5. Availability of University IT network	.583
6. Availability of IT access tools	.553
7. Sufficiency of IT infrastructure	.458
8. Availability of IT telecommunication systems	.447
Extraction Method: Principal Component Analysis.	
1 component extracted.	

#### **4.5 Reliability and Validity after Factor Analysis**

The reliability and validity after factor analysis had slight changes as shown in table 4.8 where IT Policy framework had a reduction in the number of items from ten to eight and the cronbach alpha increased from 0.806 to 0.882 while IT Literacy variable had a reduction in the number of items from nine to eight and the cronbach alpha increased from 0.870 to 0.907. the rest of the variables that is IT Implementation procedure , IT Infrastructure and dependent variable Improvement of Human Resource Function remained the same.

**Table 4.8: Reliability and Validity Measurement Results**

Constructs	Number of Items	Cronbachs Alpha
<b>Independent variables</b>		
IT Policy Framework	8	0.882
IT Implementation Procedure	10	0.896
IT Literacy	7	0.907
IT Infrastructure	8	0.817
<b>Dependent variable</b>		
Improvement in Human Resource Function	10	0.826

#### **4.6 Demographic Characteristics of the Respondents**

The respondents for this study were a total of 118 in which 73 (61.9%) were male and 45 (38.1%) female as shown below. Age of respondents was considered important for this study since the perceptions, thinking, experience and performance differ depending on age (Skirbekk, 2003).

**Table 4.9: Gender Distribution of Respondents**

<b>Gender</b>	<b>Percentage</b>
Male	61.9
Female	38.1
<b>Total</b>	<b>100</b>

Table 4.10 below shows majority of the respondents 59 (50.0%) had worked in the human resource department for more than 9 years and the rest 32 (27.1%) between 1-3 years, 12 (10.2%) below one year, 8 (6.8%) between 6-9 years, 7(5.9%) between 3-6 years. This shows all age brackets were captured in the study. Further, many years of experience enables respondents to provide accurate information of a given concept in the organization such as adoption of Information Technology in Human Resource Function (Sani, 2012).

**Table 4.10: Working Experience in Years**

<b>Period</b>	<b>Percentage</b>
Below one Year	10.2
1 – 3 Years	27.1
3 – 6 Years	5.9
6 – 9 Years	6.8
Above 9 Years	50.0
<b>Total</b>	<b>100</b>

Majority of the respondents 42 (35.6%) are between age 38-48 years, 37 (31.4%) above 48 years, 27 (22.9%) between 28-38 years and 12 (10.2%) between 18-28 years as indicated in Table 4.11 which indicates all age brackets were put into perspective therefore reducing levels of biasness in the study.

**Table 4.11: Ages of Respondents**

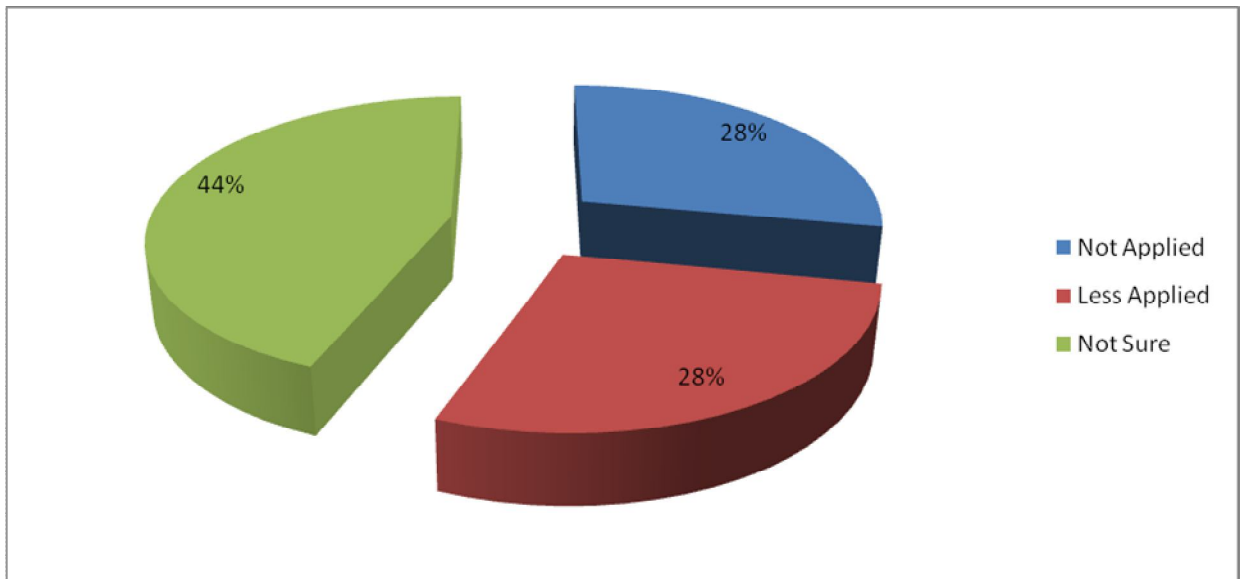
<b>Age</b>	<b>Percentage</b>
18 – 28 Years	10.2
28 – 38 Years	22.9
38 – 48 Years	35.6
Above 48 Years	31.4
<b>Total</b>	<b>100</b>

#### **4.7 Level of IT application in HR function Activities**

Although the adoption of IT in Human Resource Management Practices has not been in existence longer than other business functions as noted by Grobler and Warnich ( 2006) it has recently come in HRM in a major way. In relation to this the HR function employees were asked to indicate the level at which IT is being utilized in the six main HR activities namely HR planning, Recruitment and selection, Training and development, Performance Management, Human Relations and HR record keeping.

#### 4.7.1 Level of IT application in H. R. Planning

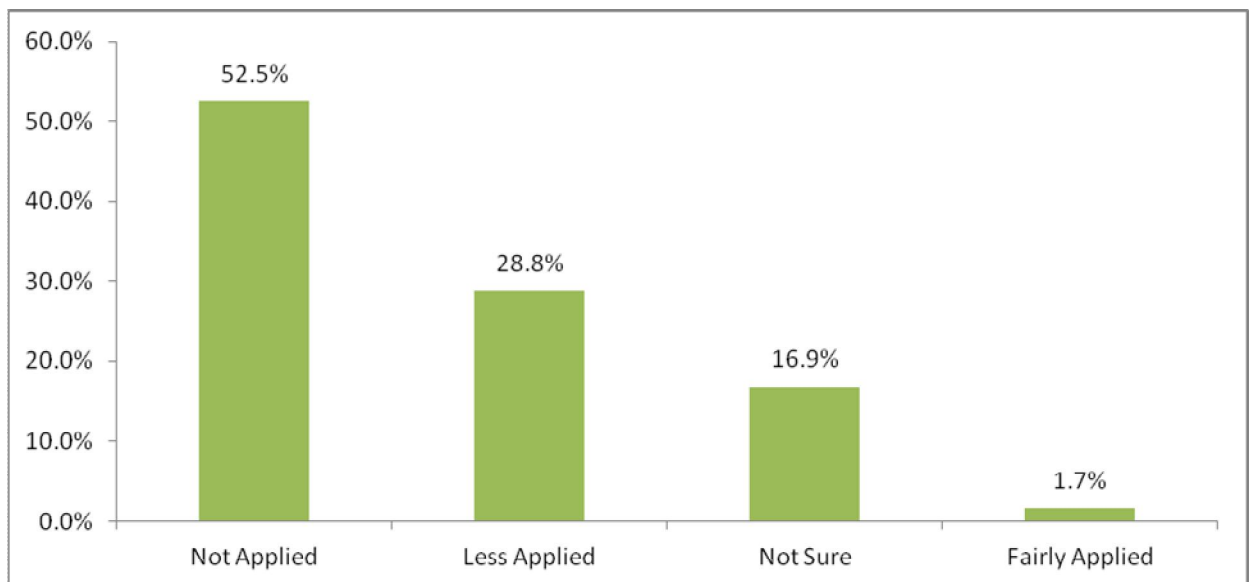
The respondents were asked to indicate the extent to which IT is applied in HR Planning. In this case as shown in figure 4.1 majority 44% are not sure whether it is applied in Human Resource Planning, 28% less applied and an equal number 28% not applied as shown in figure 4.1 below. Human Resource planning Module is expected to provide information to help estimate future labour supply and demand by analyzing current staffing levels and skill mixes, turnover, promotions and other employee movements such as transfers and demotions (Manzini and Grindley, 1986).



**Figure 4.1: Level of IT application in H. R. Planning**

#### 4.7.2: Level of IT application in Recruitment and Selection

The respondents were asked to indicate the extent to which IT is applied in recruitment and selection. As shown in figure 4.2 majority 52.5% indicated that it is not applied in recruitment and selection, 28.8% less applied, 16.9% not sure and 1.7% fairly applied. This trend is against what is happening in developed countries where as noted by Manzini and Grindley, (1986) companies are now using software to recruit, screen, and pretest applicants online before hiring them. In agreeing with this trend Oz (2009) argues that currently due to the growing number of job applicants many organizations refuse to receive paper applications and resumes. Therefore, it is no wonder that some companies may accept such documents via email, but that others accept only forms that are filled out and submitted on-line.

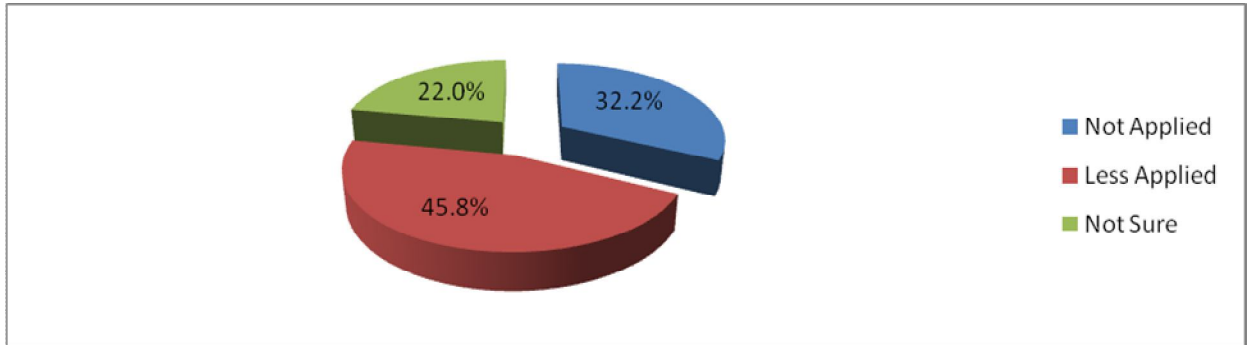


**Figure 4.2: Level of IT application in Recruitment and Selection**



#### **4.7.3: Level of IT application in Training and Development**

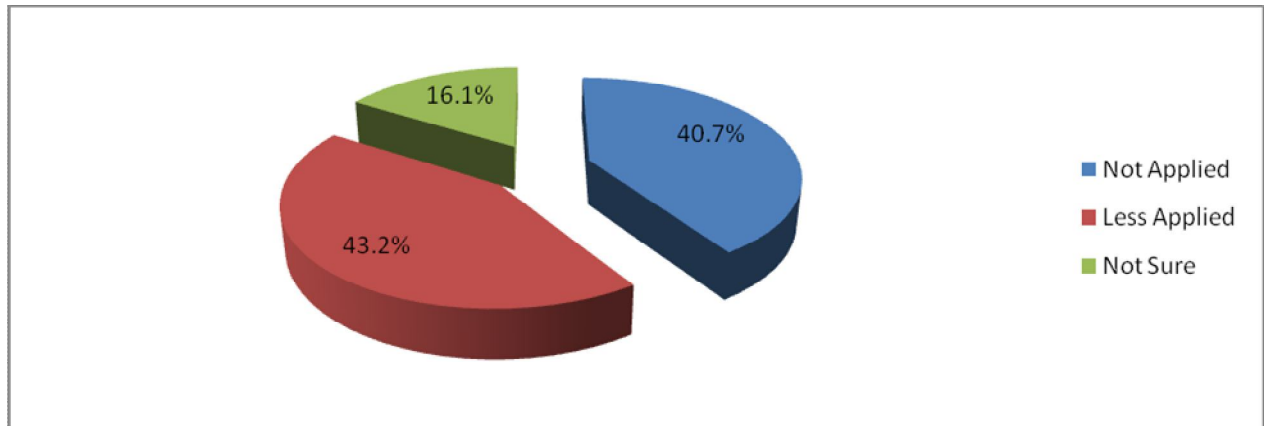
The respondents were asked to indicate the extent to which IT is applied in training and development. IT is less applied in training and development 45.8%, not applied 32.2% and not sure 22.0% as shown in figure 4.3. As noted by Oz (2009), in most organizations in both the manufacturing and service sectors, multimedia software training is rapidly replacing training programs involving classrooms and teachers. Such applications include interactive, three dimensional simulated environments. Training software emulates situations in which employees act and includes tests and modules to evaluate a trainee's performance. In addition, to the saving in trainer's time there are other benefits. The trainee is more comfortable because he or she controls the speed at which the sessions run. The software lets the trainee go back to a certain point in the session if a concept is missed. Also the software can emulate hazardous, situations, thereby testing employee performance in a safe environment. Developments in IT enable organizations to reduce the costs of training drastically as one can move the training materials and exams to a central website so employees can share and personalize learning. Using a web browser, they can find the materials they need , bookmark selected web pages, leave the training session when they wish, and come back to finish it later (Oz, 2009).



**Figure 4.3: Level of IT application in Training and Development**

#### **4.7.4: Level of IT application in Performance Management**

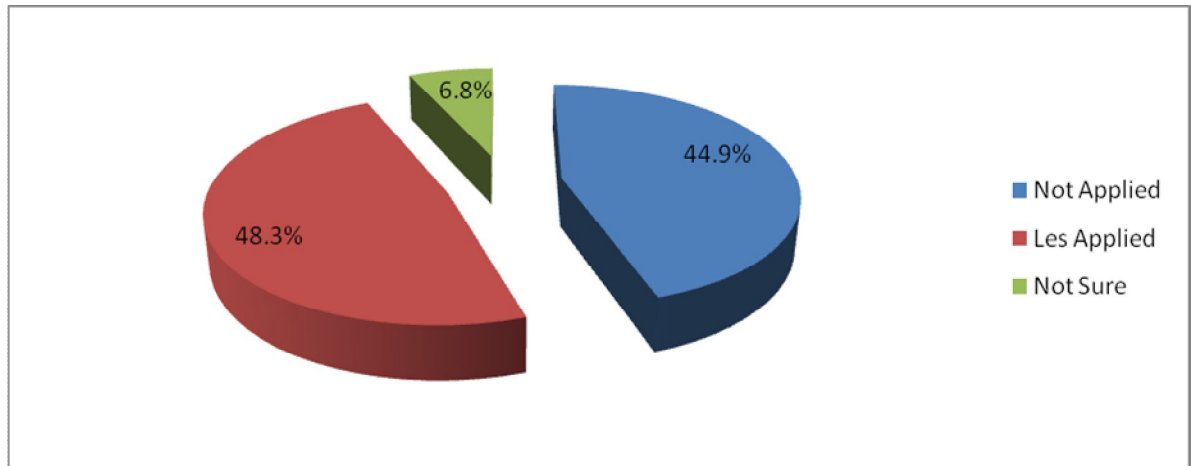
The respondents were asked to indicate the extent to which IT is applied in performance management. On whether IT is applied in performance management 43.2% indicated that its less applied as shown in figure 4.4, 40.7% not applied and 16.1% not sure. Performance management which encompasses performance measurement and reward systems is an important function performed by the HR department. According to Oz (2009) Compensation and benefits management systems can help HR officers manage compensation efficiently and effectively for example; available software programs can easily calculate weekly, monthly and hourly pay according to annual salaries and can include federal, state and local tax tables to assist to complying with compensation regulations.



**Figure 4.4: Level of IT application in Performance Management**

#### **4.7.5: Level of IT application in Human Relations**

The respondents were asked to indicate the extent to which IT is applied in Human Relations. On IT application on human relation matters 48.3% say it's less applied, 44.9% not applied and 6.8% not sure as shown in figure 4.5. The welfare of employees in terms of working conditions, health and safety issues, provision of social amenities, participation in trade union activities among others are crucial in all organizations and cut across the other aspects of HR management such as; training and development, performance management, HR planning among others. Mcleod and Schell (2009), note that HRIS provides information to managers throughout the firm concerning the firm's human resources. The output subsystems of the HRIS each address a particular aspect of HR management; planning, recruiting and managing the workforce, compensating the employees; providing employee benefits; and preparing the many HR reports that are required by the environment, primarily government agencies.

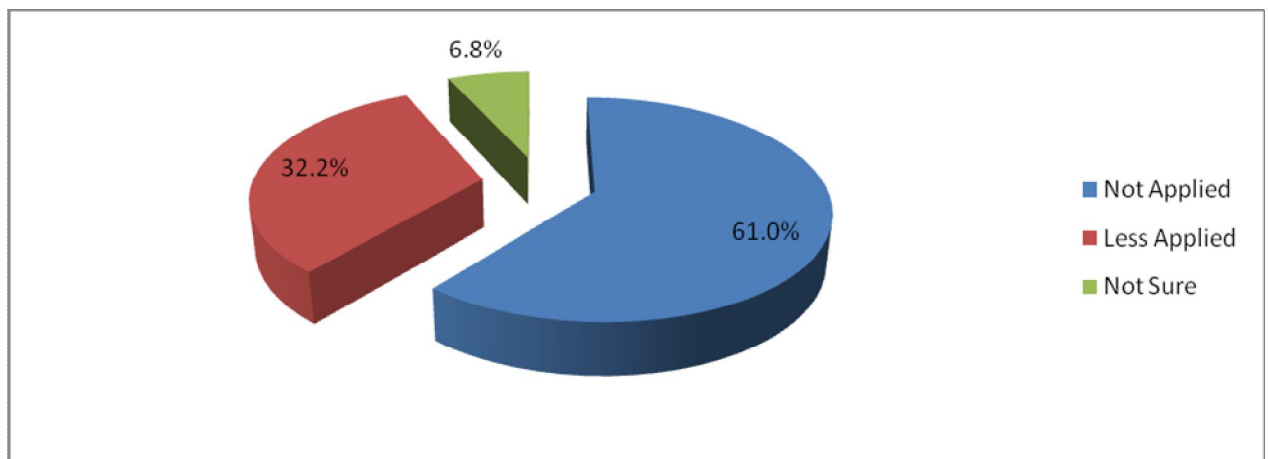


**Figure 4.5 Level of IT application in Human Relations**

#### **4.7.6: Level of IT application in HR Record Keeping**

Finally, the respondents were asked to indicate the extent to which IT is applied in HR record keeping. As shown in figure 4.6 according to the respondents who represented 61.0% indicated that IT is not applied in HR record keeping, 32.2% less applied and 6.8% not sure. Ordinarily the HR Function within an organization should have a system of recording employee information. According to Manzini and Grindley ( 1986) basic personnel module is normally the first to be created since it is the cornerstone of the basic information to be found in the system. It includes information such as the name, Identity number, date of entry, job classification, location, job specifications and descriptions, salary comparison data, address, telephone numbers among others. HR department must keep personnel records to satisfy both external regulations (such as federal and state laws) and internal regulations, as well as for payroll and tax collection and deposit, promotion consideration, and periodic reporting. Many HRISs are now

completely digitized (including employees' pictures) which dramatically reduces the space needed to store records, the time needed to retrieve them and the costs of both (Oz, 2009). This is not the case in Kenyan Public Universities as depicted in the figure 4.6 below.



**Figure 4.6: Level of IT application in HR Record Keeping**

#### **4.8: Improvement of HR Function due to adoption of IT**

The respondents were asked to give their answers to five likert scale closed ended questions in a scale of 1-5 where 1- Strongly Disagree, 2-Disagree, 3- Not Sure, 4- Agree, 5- Strongly Disagree on questions related to improvement of HR function due to Information Technology adoption.

**Table 4.12: Respondents' Opinion on Improvement of HR function due to IT adoption**

Respondents Opinion		Percentage				
Adoption of IT in HR function has lead to;	SD	D	NS	A	SA	Total
Reduction of running HR function costs	38.1	41.5	16.9	2.5	0.8	100
Increased HR function effectiveness	44.9	26.3	20.3	5.9	2.5	100
Streamlining of HR activities	52.5	23.1	0.8	13.6	0	100
Labour and time-saving in the HR department	47.5	32.2	11.0	5.9	3.4	100
Improvement of quality	42.4	27.1	21.2	8.5	0.8	100
Rapid response leading to faster decision making	61.0	35.6	1.7	1.7	0	100
Easier communication	56.8	18.6	20.3	2.5	1.7	100
Global market connection	36.4	47.5	7.6	6.8	1.7	100
Improved knowledge base of HR employees	57.6	31.4	5.1	5.1	0.8	100
Easy connectivity of HR department with other departments	38.1	34.7	21.2	4.2	1.7	100
<b>Average</b>	47.5	31.8	12.6	5.6	1.3	100

Majority of the respondents 49 (41.5%) disagree that adoption of IT has lead to reduction of running HR function costs followed by 45 (38.1%) strongly disagree, 20

(16.9%) not sure, 3 (2.5%) agree and 1 (0.8%) strongly agree. Often according to Wilson (1996) the most obvious benefit, an information system can save costs, by, for example, automating processes which people have previously done more slowly and expensively. The initial drive to adopt (HRIS) was related to cutting HR costs (Scott and Bohlandern, 2007). In agreeing with the other scholars Boddy et al (2002) notes that a modern information system can save an organization from a future increase in costs, lead to prospects of increased sales through offering new services, delivery channels, promotional activities, or market penetration.

On whether the adoption has lead to increased HR function effectiveness majority 53 (44.9%) strongly disagree, 31 (26.3%) disagree, 24 (20.3%) not sure, 7 (5.9%) agree and 3 (2.5%) strongly agree. According to Boddy et al (2002) a major benefit is the ability of a computer-based system to reduce errors when it replaces a manual system. They argue while people can provide a personal and flexible service, they can also make mistakes and act inconsistently. In addition Jones and George (2006) indicate that the rapid advances in IT have been associated with a “delaying” (flattening) of the organizational hierarchy and a move toward greater decentralization and horizontal information flows within organizations. By providing managers with high quality, timely, relevant and relatively complete information, modern Management Information Systems have reduced the need for a hierarchy to function as means of controlling the activities of the organization. In addition, they have reduced the need for a management hierarchy to coordinate organizational activities and hence enhancing organizational effectiveness. Moreover according to them, one reason for an increase in efficiency is

that the use of advances in information systems can reduce the number of employees required to perform organizational activities.

Majority strongly disagree 62 (52.5%) that IT adoption has lead to streamlining of HR activities followed by 39 (23.1%) disagree, 16 (13.6%) agree and 1 (0.8%) not sure. According to Lusthaus, 2000, Grobler and Warnich (2006) one of the most significant issues faced by modern organizations is the use of technology to streamline activities. When asked if IT adoption has lead to labour and time-saving in the HR department 56(47.5%) strongly disagree, 38 (32.2%) disagree, 13(11.0%) not sure, 7 (5.9%) agree and 4 (3.4%) strongly agree. The respondents' opinion contradict available literature such as Oz ( 2009) who argues the use of IT in HRM activities such as recruitment and selection reduces the time spent on a typical search from several hours to several minutes for example, reviewing resumes sent by applicants can start immediately instead of waiting for the typical 6-8 days from traditional advertising.

Majority 50 (42.4%) strongly disagree that IT adoption in HR function has led to improvement of quality while 32(27.1%) disagree, 25 (21.2%) not sure, 10 (8.5%) agree and 1 (0.8%) strongly agree. According to Shrivastava and Shaw (2003) just as in automated production, automated HRM promises advantages in costs, time and most importantly in this case quality of HR processes. Regarding rapid response leading to faster decision making the highest number of respondents 72 (61.0%) strongly disagree, 42 (35.6%) disagree, 2 (1.7%) not sure and an equal number 2 (1.7%) agree. It is argued by Mathias and Jackson (2003) that decisions are impossible without information with attributes of quality, timeliness, completeness and relevance. On the other hand,



managers are constantly seeking information to support their decision-making hence the growth of Information Systems. An effective HRIS improves the efficiency with which data on employees and HR activities are compiled and having accessible data enables HR Planning and managerial decisions making to be based to a greater degree on information rather than relying on managerial perceptions or intuitions.

Majority 67 ( 56.8%)strongly disagree that IT adoption has lead to easier communication followed by those who are not sure 24 (20.3%) , disagree 22( 18.6%), Agree 3 ( 2.5%) and strongly agree 2 ( 1.7%). On whether global market connection has been enhanced due to IT adoption 56 (47.5%) disagree, 43 (36.4%) strongly disagree, 9 (7.6%) not sure, 8 (6.8%) agree and 2 (1.7%) strongly disagree. According to Lepak and Snell, ( 1998) IT improves collaboration which refers to the networking of spatially segregated actors in a given field in this case HRM such as HR professionals, line managers, employees, applicants, consultants among many other actors. In addition Gusella (2000) notes that networking is becoming a technique of choice in the public service to meet the demands of the external environment such as transition to the knowledge economy, globalization, technological innovation, shifts in the social fabric and citizen expectations. Further, MIS Curriculum of 2004 developed by Metropolitan State University notes that because of technology, one can now have the ability to market your products and services in countries all over the world and develop partnerships and alliances with other businesses throughout the globe.

On whether there has been Improved knowledge base of HR employees due to IT adoption majority 68 (57.6%) strongly disagree, 37 (31.4%) disagree, 6 (5.1%) not sure, the same number 6 (5.1%) agree and 1 (0.8%) strongly agree. In organizations that have automated their systems it provides comprehensive HR-related Knowledge as one of its essential by-products. According to Wilson (2002) it is clear that knowledge workers cannot perform well in the secrecy and mistrust of a traditional command- and – control environment associated with personnel function hence the need to motivate them by giving them the problem and trust them with all the available information, then leave them to find a solution. In addition to providing basic information to employees Kovach and Cathcart, (1999) note that Informed HRM promises advantages in the entire process of planning and controlling HR and therewith also a more strategic orientation of HRM.

Finally, regarding if there has been easy connectivity of HR department with other departments due to IT adoption majority 45 ( 38.1%) strongly disagree followed by almost an equal number 41 ( 34.7%) disagree, 25 ( 21.2%) not sure, 5 ( 4.2%) agree and 2 ( 1.7%) strongly agree. The importance of this kind of connectivity cannot be underestimated Lussier R.(2003) says that with information networks which connect all employees from headquarters and remote facilities to each other, to suppliers and customers, and into databases it is no longer necessary to have all employees in one facility. In addition, with internal computer networks, employees in an organization have direct access to each other and to the information they need to do their work. Therefore,

all employees can do their jobs in a more informed and efficient manner by using the shared databases and by having direct contact with others.

On average majority of the respondents strongly disagree 47.5% on statements related to how Human Resource Function has improved due to adoption of IT followed by 31.8% who disagree, 12.5% not sure, 5.6% agree and 1.3% strongly agree. Previous studies such as Wanyembi (2002) note though there is clear evidence that ICT is being utilized to support the universities mission of learning, teaching, research and for administrative purposes, the establishment of ICT departments in the public universities and introduction of ICT related courses within their programs, it is yet to be utilized fully and successfully. In agreeing with this a study by Bii and Mugo, (2006) pointed out that an institution of higher learning research and scholarship which is widely expected to be a torch bearer in the use of ICT for creation, processing, storage, retrieval, and dissemination of information has not succeeded in this noble endeavor. In addition, they pointed out that the adoption and utilization of ICT at Moi University, and indeed in Kenya's public universities, is at its infancy. They noted that these technologies have not been fully and successfully adopted in Kenya due to a variety of impediments.

#### **4.9 To investigate the Effect of IT Policy Framework on Improvement of Human Resource Function in Kenyan Public Universities.**

##### **4.9.1 Descriptive Analysis Results for IT Policy Framework**

Respondents sampled from HR employees in the seven public universities were asked to indicate their level of agreement of statements related to IT policy framework in their respective HR departments. The respondents were asked to give their answers to a five

likert scale closed ended questions in a scale of 1-5 where 1- Strongly Disagree ( SD), 2-Disagree (D), 3- Not Sure ( NS), 4- Agree ( A), 5- Strongly Agree ( SA) on the independent variables , IT policy framework statements. Table 4.13 presents findings on IT policy framework statements as responded to by Human Resource Employees within the Human Resource Departments in the seven Kenyan public universities.

**Table 4.13: Respondents’ Opinion on Information Technology Policy Framework**

Response opinion	Percentage					Total
	SD	D	NS	A	SA	
Adequacy of IT policy	5.1	29.7	52.5	6.8	5.9	100
Applies to all users	41.5	30.5	18.6	3.4	5.9	100
IT policies sets parameters for Appropriate use	15.3	28	28	16.9	11.9	100
Enforcement procedures in case of inappropriate use	20.3	34.7	33.1	11.9	0	100
Indication for further development of IT	20.3	21.2	47.5	11	0	100
Proper authorization to access IT systems	20.3	33.1	30.5	11	5.1	100
Rules on use of personal computers on the network	20.3	17.8	43.2	15.3	3.4	100
<b>Average</b>	20.4	27.8	36.2	10.9	4.6	100

Table 4.13 shows that on the adequacy of the IT policy framework in ensuring successful adoption IT in HR function majority 62 ( 52.5%) are not sure, 35 ( 29.7%) disagree, 8 ( 6.8%) agree, 7 ( 5.9%) strongly agree while 6 ( 5.1%) strongly disagree. Bii

and Mugo (2006) pointed out that the adoption and utilization of ICT at Moi University, and indeed in Kenya's public universities, is at its infancy. Further, this adoption and utilization is definitely not the result of a strategic information policy plan. In agreeing with this state of affairs Rodrigues (2008) point out that most Kenyan universities have not yet developed comprehensive ICT policies and strategies. He adds that universities have not yet addressed security issues fully and neither do they have operational IT security policies. However on the contrary Farrell (2007) in agreeing with Wanyembi (2002) says that each university in Kenya has developed its own ICT policy. The high percentage of not sure may be attributed to the fact that majority have not come across the IT policy manual in all the Kenyan public universities.

On whether the IT policy applies to all users 49 (41.5%) strongly disagree, 36 (30.5%) disagree, 22 (18.6%) are not sure, 7 (5.9%) strongly agree and 4 (3.4%) agree. This is likely caused by the fact that many have not gained access to IT policy and therefore they do not think it applies to them as Human Resource function employees. This against expectations as scholars such as Wheelen and Hunger, (2004) have argued that to maintain a perspective on behalf of the whole organization, the structure responsible for IT applications has to have senior management presence and bring together the needs of end-user departments and the services of information technology suppliers (Baltzan and Phillips, 2009)

On whether the IT policy sets parameters for appropriate use majority 33 (28%) disagree and an equal number 33 (28%) are not sure, 20 (16.9%) agree, 18 (15.3%)

strongly disagree while 14 (11.9%) strongly agree. On the other hand, Regarding whether the IT policy contains enforcement procedures in case of inappropriate use of IT 41 (34.7) disagree, 39 (33.1%) not sure, 24 (20.3%) strongly disagree and 14 (11.9%) agree. According to Baltzan and Phillips (2009) Information Technology policies should indicate and set employee expectations about the organization's practices and standards and protect the organization from misuse of computer systems and IT resources. IT policy ordinarily should indicate ways for further development of IT but according to the respondents on the university IT policy 56 (47.5%) are not sure, 25 (21.2%) disagree, 24 (20.3%) strongly disagree while only 13 (11%) agree.

On proper authorization to access IT systems 39 (33.1%) disagree, 36 (30.5%) are not sure, 24 (20.3%) strongly disagree, 13 (11%) agree and 6 (5.1%) strongly agree. On whether the existing IT policy contains rules on use of personal computers on the network 51 (43.2%) are not sure, 24 (20.3%) strongly disagree, 21 (17.8%) disagree, 18 (15.3%) agree and 4 (3.4%) strongly agree. In addition, on whether the IT policy indicates ways of repairing and maintaining IT facilities 48 (40.7%) are not sure, 31 (26.5%) strongly disagree, 25 (21.2%) disagree, 9 (7.6%) strongly agree and 5 (4.2%) agree. If an organization's employees use computers at work, the organization should, at a minimum, implement epolicies. Epolicies are policies and procedures that address the ethical use of computers and internet usage in the business environment (Baltzan and Phillips, 2009).

Finally on average majority of the respondents 36.2% were not sure on items in the questionnaire related to IT Policy Framework followed by 27.8% who disagree, 20.4% strongly disagree, and 10.9% agree and 4.6% strongly agree. In supporting this (Etta and Elder, 2005) note that in Kenya the formulation of the ICT Policy is faced by the challenge of lack of dialogue and participation of key stakeholders. Generally, according to Baltzan and Philips, (2009), IT Policy typically embody the following; First ethical computer use policy, which contains general principles to guide computer user behavior. Second, acceptance user policy, which is a policy that a user must agree to follow in order to be provided access to a network or to the internet. Third, E-mail privacy policy that details the extent to which e-mail messages may be read by others. Fourth, internet use policy which contains general principles to guide the proper use of the internet and finally, anti spam policy which simply states that e-mail users will not send unsolicited e-mails (or spam).

#### **4.9.2 IT Policy Framework Pearson Correlation Computation**

Pearson correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (Sekeran, 2008 & Kothari, 2004).

Based on the results in table 4.14, the correlation coefficient ( $\rho$ ) between Improvement of HR Function and IT Policy Framework was found to be -0.009 at ( $P=0.922$ ). This implies that according to the study there was a negligible correlation between the two Variables (IT Policy Framework and Improvement of HR Function). These study findings agree with previous studies that show there is lack of IT policy Framework in higher education in Kenya and therefore cannot lead to improvement of Human Function due to IT adoption. For example Nyandiere (2007) notes in his study that one of the challenges of ICT utilization in higher education is lack of clear policies and management framework for acquisition and replacement of hardware, software purchases and licensing, security of ICT resources, ongoing assessments of new technology.

In addition, according to Katundu (2000) one of the impediments in IT adoption is the failure to prioritize the information sector and its contribution to national development in the developing countries which has led to lack of funding and information policies in all sectors of their economy, including higher Educational institutions. Further, this adoption and utilization is definitely not the result of a strategic information policy plan.



**Table 4.14: IT Policy Framework Pearson Correlation Computation**

		<b>Improvement of HR Function</b>	<b>IT Policy Framework</b>
<b>Improvement of HR Function</b>	P. Correlation	1	-0.009
	Sig. ( 2-tailed)		.922
	N	118	118
<b>IT Policy Framework</b>	P. Correlation	-0.009	1
	Sig. ( 2-tailed)	.922	
	N	118	118

#### 4.9.3 Regression Analysis Result of IT Policy Framework

The model equation  $Y = \beta_1 X_1 + \varepsilon$  explained 0% as measured by the goodness of fit as shown in Table 4.15. This showed that IT policy Framework explained 0% of the variation in Improvement of HR Function. This is a weak relationship since it is way below the recommended 30% by scholars such as among others Mugenda and Mugenda (2003), Sekeran (2003) among others. This supports the argument by some scholars such

as Nyandiera (2007), Ayoo and Otiye (2002) among others who claim that IT Policy Framework is facing challenges and in some cases it does not exist in Kenyan Public Universities and therefore does not explain any improvement of Human Resource Function.

**Table 4.15: Model Summary for Regression between IT Policy Framework and Improvement of HR Function**

R	R Square <sup>b</sup>
.009 <sup>a</sup>	.000
a. Predictors: IT Policy Framework	
b. Dependent Variable: Improvement of HR Function	

The ANOVA results indicated that the model of Improvement of HR Function with IT Policy Framework was not significant at  $F = 0.10$ ,  $P = 0.922$  and explained the variance in Improvement of HR Function in Kenyan Public Universities the results of the analysis of variance (ANOVA) are presented in Table 4.16.

**Table 4.16: ANOVA for IT Policy Framework and Improvement of HR Function**

		ANOVA <sup>ab</sup>			
Model		Sum of Squares	Df	Mean Square	F Sig.
1	Regression	.219	1	.219	.010 .922 <sup>a</sup>
	Residual	2635.154	116	22.717	
	Total	2635.373	117		
a. Predictors: IT Policy Framework					
b. Dependent Variable: Improvement of HR Function					

According to the results of regression, IT Policy Framework was found to have a no significant influence on Improvement of HR Function. This is illustrated by the regression result at 95% confidence interval with unstandardized beta coefficient of -0.008 and t-value -0.098 ( $p= 0.922$ ). In agreeing with this state of affairs Rodrigues (2008) point out that most Kenyan universities have not yet developed comprehensive ICT policies and strategies. He adds that universities have not yet addressed security issues fully and neither do they have operational IT security policies.

**Table 4.17: Coefficients for regression between IT Policy Framework and Improvement of HR Function**

	Coefficients <sup>ab</sup>		Sig.
	B	T	
IT Policy Framework	-.008	-.098	.922
a. Dependent Variable: Improvement of HR Function			
b.IT Policy Framework			

The study accepted the null hypothesis that there is no significant linear relationship between IT Policy Framework and improvement of HR Function in Kenyan Public universities. Thus, the study rejected the alternative hypothesis that there is significant linear relationship between IT Policy Framework and Improvement of Human Resource Function. Previous studies conducted for example by Rodrigues, (2009) Nyandiere, (2007) have indicated the lack of IT Policy Framework which explains the lack of relationship between IT Policy Framework and Improvement of Human Resource Function. On the other hand situations where IT Policy Framework exists it has not been

implemented for example a study carried out in 2005 for the African Virtual University (AVU) found that while most of the partner institutions either have an ICT policy in place or are developing one, they lack the resources to implement it. It is clear from the available literature that ICT policies and directorates to implement the policies have been in existence in Kenya starting from the government ICT policies, Ministry of Higher education all the way to individual Kenyan Public Universities but IT adoption is still low and thus not likely to lead to improvement of Human Resource Function.

#### **4.10 To determine the effect of IT Implementation Procedure on Improvement of Human Resource Function in Kenyan Public Universities.**

##### **4.10.1 Descriptive Results for IT Implementation Procedure**

The respondents were asked to give their answers to a five likert scale closed ended questions in a scale of 1-5 where 1- Strongly Disagree, 2-Disagree, 3- Not Sure, 4- Agree, 5- Strongly Agree on the independent variable IT implementation procedure statements. HR employees in the seven public universities were asked to indicate their level of agreement of statements related to IT implementation procedure in their respective HR departments.

**Table 4.18: Respondents' Opinion on IT Implementation Procedure**

<b>Respondents opinion</b>	<b>Percentage</b>					<b>Total</b>
	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>	
Changing from manual to IT systems	46.6	26.3	19.5	3.4	4.2	<b>100</b>
Introduction of IT systems is well planned and organized	45.8	8.5	32.2	11.9	1.7	<b>100</b>
Top management support	24.6	20.3	28.8	24.6	1.7	<b>100</b>
Procedures in introduction of IT systems	20.3	16.1	32.2	22.9	8.5	<b>100</b>
Implementation of IT is in line with organizational goals	8.5	39	22	28.8	1.7	<b>100</b>
Management committing organizational resources	27.1	23.7	19.5	28	1.7	<b>100</b>
Implementation of IT is an all inclusive exercise	20.3	38.1	24.6	15.3	1.7	<b>100</b>
Implementation of IT has measurable objectives	15.3	17.8	43.2	22	1.7	<b>100</b>
Clear timeline with completion targets	13.6	36.4	28	20.3	1.7	<b>100</b>
HR employee have duty to manage IT systems	45.8	22.9	19.5	0	11.9	<b>100</b>
<b>Average</b>	<b>26.7</b>	<b>24.9</b>	<b>26.9</b>	<b>17.7</b>	<b>3.6</b>	<b>100</b>

The respondents were asked if there was a defined formal procedure of changing from manual systems to IT systems where majority 55 (46.6%) strongly disagreed, 31 (26.3%) disagreed, 23 (19.5%) not sure, 5 (4.2%) strongly agreed and 4 (3.4%) agreed. This goes against expectation since implementation according to Wilson, (2000)

implementation procedure is the action that must follow any preliminary thinking in order for something to actually happen. On whether the introduction of IT systems is well planned and organized 54 (45.8%) strongly disagree, 38 (32.2%) not sure, 14 (11.9%) agree, 10 (8.5%) disagree and the least 2 (1.7%) strongly agree. In relation to planning and organization of IT Deployment Ward (1995) argues that the process of implementation requires that a framework exist for its development.

On the question regarding management support towards IT implementation majority 34 (28.8%) are not sure 29 (24.6 %) agree and the same number 29 (24.6 %) strongly disagree, 24 (20.3%) disagree and 2 (1.7%) strongly disagree. Management support is key to IT Implementation as Lucas, (1975) states top management support and user involvement is important to IT implementation process effectiveness from the unique standpoint that it aids in the avoidance of resistance. In supporting this argument Ward, 1995 IT deployment is a crucial process and such it warrants the direct attention and leadership of top management. On whether there are procedures in introduction of IT systems 38 (32.2%) are not sure, 27 (22.9%) agree, 24 (20.3%) strongly disagree, 19 (16.1%) disagree and 10 (8.5%) strongly agree. On whether the implementation of IT is in line with organizational goals 46 (39%) disagree, 34 (28.8%) agree, 26 (22%) are not sure, 10 (8.5%) strongly disagree while 2 (1.7%) strongly agree. It is argued for IT Implementation to be really effective it necessitates the infusion of organizational goals and missions into the process at the very beginning or planning stages (Ward, 1995).

Regarding committing of organizational resources by management towards implementation of IT 33 (28%) agree, 32 (27.1%) strongly disagree, 28 (23.7%) disagree, 23 (19.5%) not sure, 2 (1.7%) strongly agree. This aspect of organizational resources is tied to the commitment level of top management .It is argued that this kind of leadership provides a distinctive dimension to the process and that is, the critical importance of commitment of organizational resources, not just fiscal resources, but those which are educational, and personnel related as well ( Ward,1995). On whether the implementation of IT is an all inclusive exercise majority 45 (38.1%) disagree, 29 (24.6%) not sure, 24 (20.3%) strongly disagree, 18 (15.3%) agree and 2 (1.7%) strongly agree. This findings contradicts existing literature since as Walton, (1989) argues the process of IT Development and deployment must be all inclusive. Further, Wilson (2002) notes the user-friendliness of the human-computer interface is extremely important during the main phases of IT implementation. In supporting this Gordon and Gordon (2004) argue that all organizational members must manage the transition from the old system to the new system.

In relation to whether the implementation of IT has measurable objectives majority 51 (43.2%) are not sure, 26 (22%) agree, 21 (17.8%) disagree, 18 (15.3%) strongly disagree while 2 (1.7%) strongly agree. Since IT has such an impact on organizational outcomes there is need to have a clear understanding of the desired organizational effects of IT (Ward, 1995). Majority disagree that 43 (36.4%) disagree that the implementation procedure has clear timeline with completion targets, while 33 (24%) are not sure, 24

(20.3%) agree, 16 (13.6%) strongly disagree and the least 2 (1.7%) strongly agree. On the issue of whether HR employees have duty to manage IT systems 54 (45.8%) strongly disagree, 27 (22.9%) disagree, 23 (19.5%) not sure and 14 (11.9%) strongly agree. Finally on average majority 26.9% are not sure followed closely by those who strongly disagree at 26.7% then 24.9% disagree, 17.7% agree and lastly 3.6% strongly agree. The study agrees with Tusubira & Mulira (2005) who noted that systematic method of implementation is one of the challenges facing ICT integration in Higher education in Africa.

#### **4.10.2 IT Implementation Procedure Pearson Correlation Computation**

Based on the results in table 4.20, the correlation coefficient ( $\rho$ ) between Improvement of HR Function and IT Implementation Procedure was found to be 0.103 at ( $P=0.269$ ). This implies that according to the study there was a negligible correlation between the two Variables (IT Implementation Procedure and Improvement of HR Function). This is due to the lack of proper implementation procedures. According to Wanyembi (2002) IT Implementation procedures in Kenyan Public Universities appear to be disjointed and disorganized and further notes the manner in which ICT was introduced was initially piecemeal, uncoordinated, and in most cases haphazard.



**Table 4.19: IT Implementation Procedure Pearson Correlation Computation**

		<b>Improvement of HR Function</b>	<b>IT Implementation Procedure</b>
<b>Improvement of HR Function</b>	P. Correlation	1	.103
	Sig. ( 2-tailed)		.269
	N	118	118
<b>IT Implementation Procedure</b>	P. Correlation	.103	1
	Sig. ( 2-tailed)	.269	
	N	118	118

**4.10.3 Regression Analysis Results of IT Implementation Procedure**

The model equation  $Y = \beta_2 X_2 + \varepsilon$  explained 1% as measured by the goodness of fit shown in table 4.20. This showed that IT Implementation Procedure explained 1% of the variation in Improvement of HR Function. This is a weak relationship as it falls below 30% and confirms the argument by Wanyembi(2002) that introduction of ICT in Kenyan

Public Universities is piecemeal, uncoordinated and in most cases haphazard thus not following a well organized implementation procedure.

**Table 4.20: Model Summary for Regression between IT Implementation Procedure and Improvement of HR Function**

R	R Square <sup>b</sup>
.103 <sup>a</sup>	.011
a. Predictors: IT Implementation Procedure	
b. Dependent Variable: Improvement of HR Function	

The ANOVA results indicated that the model of Improvement of HR Function with IT Implementation Procedure was not significant at  $F = 1.233, P = 0.269$  and explained the variance in Improvement of HR Function in Kenyan Public Universities the results of the analysis of variance (ANOVA) are presented in Table 4.21.

**Table 4.21: ANOVA for IT Implementation Procedure and Improvement of HR Function**

		ANOVA <sup>b</sup>				
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	27.720	1	27.720	1.233	.269 <sup>a</sup>
	Residual	2607.653	116	22.480		
	Total	2635.373	117			
a. Predictors: (Constant), IT Implementation Procedure						
b. Dependent Variable: Improvement of HR Function						

According to the results of regression, IT Implementation Procedure was found to have negligible influence on Improvement of HR Function. This is illustrated by the regression result at 95% confidence interval with unstandardized beta coefficient of 0.77 and t-value 1.110 ( $p = 0.269$ ). In relation to planning and organization of IT Deployment Ward (1995) argues that the process of implementation requires that a framework exist for its development. Further he argues for IT Implementation to be really effective it necessitates the infusion of organizational goals and missions into the process at the very beginning or planning stages.

**Table 4.22: Coefficients for regression between IT Implementation Procedure and Improvement of HR Function**

		Coefficients <sup>ab</sup>		
		B	T	Sig.
IT Procedure	Implementation	.077	1.110	.269
a. Dependent Variable: Improvement of HR Function				
b. IT Implementation Procedure				

The study accepted the null hypothesis that there is no linear relationship between IT Implementation Procedure and improvement of HR Function in Kenyan Public universities. Therefore the study rejected the alternative hypothesis that there is significant linear relationship between IT Implementation procedures and Improvement of Human Resource Function. Though, as noted by Farrell (2007) Kenya has a sophisticated ICT in Education Strategy and implementation plan which is embedded in

the national ICT policy and was developed through consultative process with stakeholders. Further, the plan has cost estimates, timelines with measureable outcomes, and specified lead agencies. However, the implementation of the good plans and strategies are yet to be actualized as Bii and Mugo (2006) pointed out that the adoption and utilization of ICT at Moi University, and indeed in Kenya's public universities, is at its infancy.

#### **4.11 To investigate the effect of IT Literacy on improvement of Human Resource Function in Kenyan Public Universities.**

##### **4.11.1 Descriptive Analysis for IT Literacy**

The respondents were asked to give their answers to a five likert scale closed ended questions in a scale of 1-5 where 1- Strongly Disagree, 2-Disagree, 3- Not Sure, 4- Agree, 5- Strongly Agree on the independent variable IT Information Literacy statements. HR employees in the seven public universities were asked to indicate their level of agreement of statements related to IT literacy levels as shown it Table 4.23 in their respective HR departments.

**Table 4.23: Respondents' Opinion on Information Technology Literacy**

<b>Respondents' Opinion</b>	<b>Percentage</b>					
	<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>	<b>Total</b>
HR employees have undergone IT training without assistance	27.1	6.8	0	33.9	32.2	<b>100</b>
Level of IT literacy is insufficient	6.8	5.1	27.1	59.3	1.7	<b>100</b>
Lack of confidence in carrying out HR activities using IT	8.5	16.9	8.5	37.3	28.8	<b>100</b>
Lack of Confidence in selecting appropriate IT technology	8.5	5.1	28.8	42.4	15.3	<b>100</b>
Lack of Confidence in necessary skills to use IT in HR	6.8	15.3	8.5	54.2	15.3	<b>100</b>
Lack of confidence in use of IT skills in HR	5.1	10.2	16.9	49.2	18.6	<b>100</b>
Lack of Confidence in helping other employees to solve IT problems	11.9	15.3	13.6	32.2	27.1	<b>100</b>
<b>Average</b>	10.6	10.6	14.7	44.0	22.0	<b>100</b>

It is worth noting from the word go that individuals play an effective and important role in technology adoption process as indicated by Szewezak and Snodgrass (2002) and for individuals to be effective in their roles in technology adoption there is need for them to acquire skills, Knowledge and the right attitudes majorly acquired through training and development. Regarding whether the HR employees have undergone IT training without assistance Majority 40 (33.9%) agree, 38 (32.2%) strongly agree, on the other hand 32 (27.1%) strongly disagree and 8 (6.8%) disagree. Lack of user acceptance to technology

has long been an impediment to the success of new technologies. Therefore, its understanding has been a high priority item for researchers and practitioner alike (Chau & Hu, 2002; Venkatesh & Davis, 2000).

However, the cost of training is often underestimated at the IT formulating and implementing stage. This tends to happen because top management lack knowledge of the technology involved and therefore, underestimate the staff training required. Similarly, functional managers probably underestimate the cost because they have a vested interest in getting the project accepted. Technical staff in turn also underestimate training costs because being experts in the field they do not perceive the needs and difficulties of new users. Normally the best person to do the training is the individual's immediate supervisor as he or she will know how best, how long is required and the approach to take when instructing a particular individual (Cashmore and Lyall, 1991).

Majority 70 (59.3%) agree that the level of IT literacy is insufficient to enable IT adoption in HR function while 8 (6.8%) strongly disagree, 6 (5.1%) disagree and 2 (1.7%) strongly agree. The lack of IT Literacy is demonstrated according to Mcleoad and Schell (2007) due to the fact that people know only the basics about their computers. As common as computers are in the workplace, most users have a poor understanding of the everyday maintenance of the computer and its applications. The insufficiency in IT skills has made HR employee lack confidence in carrying out HR activities using IT. This is reflected in the high numbers 44 (37.3%) who agree that they lack confidence to carry out HR activities using IT, 34(28.8%) strongly agree, 20 (16.9%) disagree, 10 (8.5%) strongly disagree and the same number not sure. On whether the HR employees

lack confidence in selecting appropriate IT technology 50 (42.4%) agree, 34 (28.8%) not sure, 18 (15.3%) strongly agree, 10 (8.5%) strongly disagree and 6 (5.1%) disagree.

Information literacy is the capacity of people to recognize their information needs; locate and evaluate the quality of information; store and retrieve information; make effective and ethical use of information and apply information to create and communicate knowledge (Catts & Lau, 2008). This definition is comprehensive because it entails all the information skills discussed above and most importantly highlights the power granted to the individual by being information literate. In supporting this idea (Cashmore and Lyall, 1991) argue that training goal should be that not only are staff able to operate or use the new system but they are also willing to use it effectively. The easiest way to make staff willing is to involve them from the start in the development of the system so that they help to create it and therefore look upon it as their 'baby'. The ICT Plans of the ministry of Higher Education in Kenya recognize a current deficit in terms of HR capacity to lead and support the implementation of the plan. Kemei ( 2003) notes that training needs of the various categories of ICT users are yet to be established. He suggests that the relevance of training as well as the reality of the fast-changing technology must be considered if such assessments are to be effectively undertaken.

Majority 64 (54.2%) agree they lack confidence that they have the necessary skills to use IT in HR function activities, 18 (15.3%) strongly agree and the same number of respondents disagree, 10 (8.5%) are not sure and 8 (6.8%) strongly agree. In addition to having the necessary skills majority 58 (49.2%) agree that they lack confidence to use IT skills in HR function activities followed by 22 (18.6%) strongly agree, 20 (16.9%) not

sure, 12 (10.2%) disagree and 6 (5.1%) strongly disagree. In addition, on whether the HR employees lack confidence in helping other employees to solve IT problems majority 38 (32.2%) agree, 32 (27.1%) strongly agree, 18 (15.3%) disagree, 16 (13.6%) disagree and 14 (11.9%) strongly disagree.

Finally on average majority 44.0% agree with statements related to IT Literacy followed by 22.0% who strongly agree, 14.7% and 10.6% who strongly disagree and disagree. These findings agree with previous studies on IT Literacy such as Chacha (2005) who noted that, ICT training in higher educational institutions in Africa that there has been insufficient training and re-skilling of end users as well as technical staff that support the systems in higher educational institutions in Kenya. Wheelen and Hunger (2008) note in a study the implementation of any form of Technology is abandoned mainly because of inadequate technological knowledge and skills. The ICT Plans of the ministry of Higher Education in Kenya recognize a current deficit in terms of HR capacity to lead and support the implementation of the plan. Kemei (2003) notes that training needs of the various categories of ICT users are yet to be established.

In relation to IT Literacy, Wheelen and Hunger (2008) say a corporation that purchases an innovative technology must have the technological competence to make good use of it. Some companies that introduce the latest technology into their processes do not adequately assess the competence of their people to handle it. Chaffey and Woodsteve (2005) argue that it would appear that many information-management-related projects fail to achieve the right balance between education and training. There is either insufficient training to be able to use new software tools correctly, or tools' training is



available and there is insufficient education about the reason for using new software tools. Insufficient education and training is a common occurrence which leads to resistance to change and under-utilization of the new tools. The quality and efficiency of ICT application in Kenya can only be achieved by means of capacity building through research and development, which are elements of information skills (Kandiri, 2006).

#### **4.11.2 IT literacy Pearson Correlation Computation**

Based on the results in table 4.24 the correlation coefficient ( $\rho$ ) between Improvement of HR Function and IT Literacy was found to be 0.206 at ( $P=0.025$ ). This implies that according to the study there was a significant positive linear correlation between the two Variables (IT Literacy and Improvement of HR Function). This can be explained by the fact that although there is in adequacy of IT Literacy there has been documentary evidence gathered from the mid 1980's to date, several ICT consultancy firms, both local and foreign, were contracted to give training to ICT staff at public universities in Kenya (wanyembi, 2002).

**Table 4.24: IT literacy Pearson Correlation Computation**

		<b>Improvement of HR Function</b>	<b>IT Literacy</b>
<b>Improvement of HR Function</b>	P. Correlation	1	.206
	Sig. ( 2-tailed)		.025
	N	118	118
<b>IT Literacy</b>	P. Correlation	.206	1
	Sig. ( 2-tailed)	.025	
	N	118	118

The study findings imply that an improvement in the IT Literacy would lead to an improvement of HR Function. Lack of user acceptance to technology due to insufficient training has long been an impediment to the success of new technologies. Therefore, its understanding has been a high priority item for researchers and practitioner alike (Chau & Hu, 2002; Venkatesh & Davis, 2000). The ICT Plans of the ministry of Higher Education in Kenya recognize a current deficit in terms of HR capacity to lead and support the implementation of the plan. Kemei (2003) notes that training needs of the various categories of ICT users are yet to be established. He suggests that the relevance

of training as well as the reality of the fast-changing technology must be considered if such assessments are to be effectively undertaken.

#### 4.11.3 Regression Analysis Results on IT Literacy

The model equation  $Y = \beta_3 X_3 + \varepsilon$  explained 68.7% as measured by the goodness of fit. This showed that IT Literacy explained 68.7% of the variation in Improvement of HR Function as shown in the table 4.25. This is a strong relationship as it is above 30% as recommended by Mugenda and Mugenda (2003), Sekeran (2003) among others and supports Szewczak and Snodgrass (2002) argument that individuals play an effective and important role in technology adoption process and therefore investment in their training should be taken seriously.

**Table 4.25: Model Summary for Regression between IT Literacy and Improvement of HR Function**

R	R Square <sup>b</sup>
.829 <sup>a</sup>	.687
a. Predictors: IT Literacy	
b. Dependent Variable: Improvement of HR Function	

The ANOVA results indicated that the model of Improvement of HR Function with IT Literacy was significant at  $F = 256,576, P = 0.000$  and explained the variance in Improvement of HR Function in Kenyan Public Universities the results of the analysis of variance (ANOVA) are presented in Table 4.26.

**Table 4.26: ANOVA for IT Literacy and Improvement of HR Function**

ANOVA <sup>a,b</sup>						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6551.400	1	6551.400	256.576	.000 <sup>a</sup>
	Residual	2987.468	117	25.534		
	Total	9538.868 <sup>b</sup>	118			

a. Predictors: IT Literacy  
b. Dependent Variable: Improvement of HR Function

According to the results of regression, IT Literacy was found to have a positive influence on Improvement of HR Function. This is illustrated by the regression result at 95% confidence interval with unstandardized beta coefficient of 0.535 and t-value 16.018 ( $p = 0.000$ ). Wheelen and Hunger (2008) say a corporation that purchases an innovative technology must have the technological competence to make good use of it. Some companies that introduce the latest technology into their processes do not adequately assess the competence of their people to handle it. For example, a survey conducted in the United Kingdom in the 1980s found that 44% of all companies that started to use robots met with initial failure, and that 22% of those firms abandoned the use of robots altogether, mainly because of inadequate technological knowledge and skills.

**Table 4.27: Coefficients for regression between IT Literacy and Improvement of HR Function**

	Coefficients <sup>ab</sup>		Sig.
	B	T	
IT Literacy	.535	16.018	0.000
a. Dependent Variable: Improvement of HR Function			
b.IT Literacy			

#### 4.11.4 IT Literacy Hypothesis Results

*There is no linear relationship between Information Technology literacy and improvement of Human Resource Function in Kenyan public universities.*

The hypotheses that

$$H_0 : \beta_1 = 0$$

VERSUS

$$H_1 : \beta_1 > 0$$

Were tested. This entailed comparing the scores of calculated t and the critical t.

**Table 4.28: Regression between IT Literacy and Improvement of HR Function**

	Coefficients <sup>ab</sup>		t-Critical
	B	T	
IT Literacy	.535	16.018	1.658
a. Dependent Variable: Improvement of HR Function			
b.IT Literacy			

Since the calculated  $t = 16.018$  is greater than the critical  $t_{118-1}(0.05) = 1.658$ , the study rejected the null hypothesis that there is no significant linear relationship between IT

Literacy and improvement of HR Function in Kenyan Public universities. Therefore the study accepted the alternative hypothesis that there is significant linear relationship between IT Literacy and improvement of HR Function. In agreeing with this Wheelen and Hunger (2008) say a corporation that purchases an innovative technology must have the technological competence to make good use of it. The quality and efficiency of ICT application in Kenya can only be achieved by means of capacity building through research and development, which are elements of information skills (Kandiri, 2006).

#### **4.12 To investigate the effect of IT Infrastructure on Improvement of Human Resource Function in Kenyan Public Universities.**

##### **4.12.1 Descriptive Analysis Results for IT Infrastructure**

The respondents were asked to give their answers to a five likert scale closed ended questions in a scale of 1-5 where 1- Strongly Disagree, 2-Disagree, 3- Not Sure, 4- Agree, 5- Strongly Agree on the independent variable IT Information Literacy statements.

Many studies as noted in chapter two including studies by Ang C.L et al (2001) and Hussein R. (2004) have shown that IS Facilities are influential in determining the success of IS adoption and implementation. In relation to this important aspect HR employees in the seven public universities were asked to indicate their level of agreement of statements related to IT Infrastructure in their respective HR departments. Table 4.30 presents findings on IT Infrastructure.

**Table 4.29: Information Technology Infrastructure**

<b>Respondents' Opinion</b>			<b>Percentage</b>					<b>Total</b>
			<b>SD</b>	<b>D</b>	<b>NS</b>	<b>A</b>	<b>SA</b>	
Sufficiency of IT infrastructure		IT	39.8	40.7	15.3	3.4	0.8	<b>100</b>
Availability of telecommunication systems		IT	50	25.4	13.6	5.1	5.9	<b>100</b>
Availability of IT multimedia systems			40.7	26.3	0.8	23.7	8.5	<b>100</b>
Availability of IT data base system			32.2	27.1	11	22	7.6	<b>100</b>
Availability of IT documents systems			38.1	15.3	24.6	11.9	10.2	<b>100</b>
Availability of electronic mail and/or fax servers			46.6	15.3	10.2	18.6	9.3	<b>100</b>
Availability of University IT network		IT	40.7	33.1	15.3	10.2	0.8	<b>100</b>
Availability of IT access tools			31.4	34.7	11	18.6	4.2	<b>100</b>

On the general question related to IT infrastructure, majority of the respondents disagree 48(40.7%) that there is sufficient IT infrastructure, 47 (39.8%) strongly disagree, 18 (15.3%) not sure, 4 (3.4%) agree and 1(0.8%) strongly agree. In Africa, as noted by Ochieng (1998) compelled by competition and the drive to lower costs, organizations are investing in information technology systems infrastructure at unprecedented rates, integrating technology into a nearly all aspects of corporate operations. However, the World Bank Institute survey report say that “the average African university has

bandwidth capacity equivalent to a broadband residential connection available in Europe, [and] pays 50 times more for their bandwidth than their educational counterparts in the rest of the world.” Another study carried out in 2005 for the African Virtual University (AVU) found that while most of the partner institutions either have an ICT policy in place or are developing one, they lack the resources to implement it.

In agreeing with this Rodriguez (2008) notes that in general, Kenyan universities find it very expensive to establish and maintain the ICT infrastructure. This is demonstrated by the fact that Inter-institutional connectivity in higher education is because of KNET. Consequently, the lack of bandwidth access seriously constraints ICT use (Farrell, 2007).According to Karin (1994) Information Infrastructure must respond to an institution’s needs for easy information access, flexibility, smooth administration, reliability and security. Further, successful adoption and use of Information Technology calls for the introduction of a network, which provides efficient and convenient access to computing and information resources and facilitates the exchange of any type of information among various departments in organizations.

Specific questions on IT infrastructure such as whether the availability of IT telecommunication systems is sufficient majority 59 (50%) strongly disagree, 30 (25.4%) disagree, 16 (13.6%) not sure, 7 (5.9%) strongly agree and 6 (5.1%) agree. The telecommunication systems are crucial in facilitating voice communication. On whether there is sufficient availability of IT multimedia systems majority 48 (40.7%) strongly disagree, 31 (26.3%) disagree, 28 (23.7%) agree, 10 (8.5%) strongly agree and 1 (0.8%)



not sure. Multimedia systems as noted by Karin (2004) aids in providing access to training materials, multimedia textbooks, and library materials.

The availability of IT data base system was not sufficient since majority 38 (32.2%) strongly disagree, 32 (27.1%) disagree, 26 (22%) agree, 13 (11%) not sure and 9 (7.6%) strongly agree. The database servers help in maintaining the institution's dynamic data manipulated by administrative systems. On availability of IT documents systems which assist in storing static information about the organization in either text or image 45 (38.1%) strongly disagree, 29 (24.6%) not sure, 18 (15.3%) disagree, 14 (11.9%) agree and 12 (10.2%) strongly agree. Chaffey and Wood (2005) note that infrastructure also includes the architecture of the networks, hardware and software. Additionally, infrastructure can also be considered to include the data and documents accessed through e-business application. They argue that they are five layers of infrastructure that is; storage/ physical which can be equated to memory and disk hardware components, processing that is human and external interfaces and also the network, application/ content which is the data processed by the application into information, intelligence which is additional computer-based logic that transforms information to knowledge.

Concerning the availability of electronic mail and/ or fax servers majority 55 (46.6%) strongly disagree, 22 (18.6%) agree, 18 (15.3%) disagree, 12 (10.2%) not sure while 11 (9.3%) strongly agree. Networks are commonly used to tap into databases such as online services that may provide access to the internet and its World Wide Web .According to Brown V. Carol et al (2009) the internet has become a trusted channel for

communicating directly with end-consumer and enabling other new ways for businesses to complete.

Majority strongly disagree 48 (40.7%) that there is availability of HR function network connected to university IT network, 39 (33.1%) disagree, 18 (15.3%) not sure, 12 (10.2%) agree and 1 (0.8%) strongly agree. On IT infrastructure needed in an organization, Lussier R. (2003) notes there is need to have an information networks which connect all employees from headquarters and remote facilities to each other, to suppliers and customers, and into databases. Local Area Network (LAN) links everyone within one facility via computers and Wide Area Network (WAN) link employees in different facilities via computers using telephone lines or long-range communication devices.

Finally on IT access tools such as firewalls, intranets, and peer-to-peer majority 41 (34.7%) agree, 37 (31.4%) strongly disagree, 22 (18.6%) agree, 13 (22%) not sure and 5 (4.2%) strongly agree. Many organizations do not want everyone to know about their activities and they also want to protect the privacy of their employees thus they use firewalls, software that limit access to unauthorized users. Intranets are networks that use internet technology, to provide access to some or all of the firm's employees. Businesses are using intranets for the internal display of company manuals covering employment and other procedures; easily updatable internal news and information services; company catalogues; and project notice boards to which project participants can add information and comments to be seen by all (Curtis and Cobham,2008). Further,

according to them intranets are replacing historical paper-based information systems because they are both cheaper and more easily updatable.

#### **4.12.2 IT Infrastructure Pearson Correlation Computation**

Based on the results in table 4.31 the correlation coefficient ( $\rho$ ) between Improvement of HR Function and IT Infrastructure was found to be 0.231 at ( $P=0.012$ ). This implies that according to the study there was a significant linear correlation between the two Variables (IT Infrastructure and Improvement of HR Function). Which imply that an improvement in the IT Infrastructure would lead to an improvement of HR Function. In Africa, as noted by Ochieng (1998) compelled by competition and the drive to lower costs, organizations are investing in information technology systems infrastructure at unprecedented rates, integrating technology into a nearly all aspects of corporate operations.

**Table 4.30: IT Infrastructure Pearson Correlation Computation**

		<b>Improvement of HR Function</b>	<b>IT Infrastructure</b>
<b>Improvement of HR Function</b>	P. Correlation	1	.231
	Sig. ( 2-tailed)		.012
	N	118	118
<b>IT Infrastructure</b>	P. Correlation	.231	1
	Sig. ( 2-tailed)	.012	
	N	118	118

However, Rodriguez (2008) notes that in general, Kenyan universities find it very expensive to establish and maintain the ICT infrastructure. This is demonstrated by the fact that Inter-institutional connectivity in higher education is because of KNET. Consequently, the lack of bandwidth access seriously constraints ICT use (Farrell, 2007).According to Karin (1994) Information Infrastructure must respond to an institution's needs for easy information access, flexibility, smooth administration,

reliability and security which are indicators of improvement of departments within any organization.

#### 4.12.3 Regression Analysis Results on IT Infrastructure

The model equation  $Y = \beta_4 X_4 + \varepsilon$  explained 62.4 % as measured by the goodness of fit as shown in Table 4.32. This showed that IT Implementation Procedure explained 62.4% of the variation in Improvement of HR Function. This shows a strong relationship since it is above the recommended 30% supporting the argument by Ochieng (1998) organizations in Africa are investing in IT systems infrastructure at unprecedented rates, intergrating technology into nearly all aspects of corporate operations.

**Table 4.31: Model Summary for Regression between IT Infrastructure and Improvement of HR Function**

R	R Square <sup>b</sup>
.790 <sup>a</sup>	.624
a. Predictors: IT Infrastructure	
b. Dependent Variable: Improvement of HR Function	

The ANOVA results indicated that the model of Improvement of HR Function with IT Infrastructure was significant at  $F = 194.437, P = 0.000$  and explained the variance in Improvement of HR Function in Kenyan Public Universities the results of the analysis of variance (ANOVA) are presented in Table 4.33.

**Table 4.32: ANOVA for IT Infrastructure and Improvement of HR Function**

ANOVA <sup>a,b</sup>						
Model	Sum of Squares	Df	Mean Square	F	Sig.	
1 Regression	5955.325	1	5955.325	194.437	.000 <sup>a</sup>	
Residual	3583.543	117	30.629			
Total	9538.868 <sup>b</sup>	118				

a. Predictors: IT Infrastructure

b. Dependent Variable: Improvement of HR Function

According to the results of regression, IT Infrastructure was found to have a positive influence on Improvement of HR Function. This is illustrated by the regression result at 95% confidence interval with unstandardized beta coefficient of 0.858 and t-value 13.944 (p= 0.000).

**Table 4.33: Coefficients for regression between IT Infrastructure and Improvement of HR Function**

Coefficients <sup>ab</sup>			
Model	B	T	Sig.
IT Infrastructure	.858	13.944	.000

a. Dependent Variable: Improvement of HR Function

b. IT Infrastructure

In supporting the findings of the study on significance of IT Infrastructure previous studies by Chung et al., (2003), Ang et al., (2001), Mohamad et al., (2009) indicated that IS facilities are influential in determining the success of IS adoption and

implementation. Adoption of information technology on Human Resource function cannot take place without the availability of technological assets which come in various forms. Karin (1994) notes that information Infrastructure must respond to the an institution's needs for easy information access, flexibility, smooth administration, reliability and security by first, maintaining the institution's information repository spanning data, images, voices, and motion videos. Secondly providing access to the information via a standard user interface from a single workstation via onetime user identification and finally, providing tools that allow for identification and navigation through all information sources unconstrained by the information's origin.

#### **4.12.4 IT Infrastructure Hypothesis Results**

*There is no linear relationship between Information Technology Infrastructure and improvement of Human Resource function in Kenyan public universities.*

The hypotheses that

$$H_0 : \beta_1 = 0$$

VERSUS

$$H_1 : \beta_1 > 0$$

were tested. This entailed comparing the scores of calculated t and the critical t.

**Table 4.34: Coefficients for Regression between IT Infrastructure and Improvement of HR Function**

Model	Coefficients <sup>ab</sup>		t-Critical
	B	T	
IT Infrastructure	.858	13.944	1.658
a. Dependent Variable: Improvement of HR Function			
b. IT Infrastructure			

Since the calculated  $t = 13.944$  is greater as shown in Table 4.35 than the critical  $t_{118-1}(0.05) = 1.658$ , the study rejected the null hypothesis that there is no significant linear relationship on between IT Infrastructure and improvement of HR Function in Kenyan Public universities. Therefore the researcher accepted the alternative hypothesis that there is significant linear relationship between IT Infrastructure and Improvement of HR Function. As noted earlier the lack of bandwidth access seriously constraints ICT use (Farrell, 2007). According to Karin (1994) Information Infrastructure must respond to an institution's needs for easy information access, flexibility, smooth administration, reliability and security. Further, successful adoption and use of Information Technology calls for the introduction of a network, which provides efficient and convenient access to computing and information resources and facilitates the exchange of any type of information among various departments in organizations.



#### 4.13 Multiple Linear Regression analysis Results for all Variables

The study aimed at finding out the overall effect of the independent variables that is IT Policy Framework, IT Implementation Procedure, IT Literacy and IT Infrastructure on Improvement of Human Resource Function.

##### 4.13.1 Regression Analysis Summary Results

The model equation  $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$  explained 74.3% as measured by the goodness of fit as shown in Table 4.36. This showed that IT Policy Framework, IT Implementation Procedure, IT Literacy and IT Infrastructure combined explained 74.3% of the variation in Improvement of HR Function.

**Table 4.35: Model Summary for Regression all Variables**

R	R Square <sup>b</sup>
.862 <sup>a</sup>	.743
a. Predictors: IT Policy Framework, IT Implementation Procedure, IT Literacy and IT Infrastructure	
b. Dependent Variable: Improvement of HR Function	

The overall model as shown on table 4.37 indicated that out of the four independent variables IT Policy Framework and IT Implementation Procedure were insignificant at  $P = 0.734$  and  $P = 0.160$  respectively. However, IT Literacy was the most highly significant at  $P = 0.000$  followed by IT Infrastructure at  $P = 0.001$ . This results supports the argument by Wheelen and Hunger (2008) that for successful adoption of technology technological competence is critical. Further, studies by Ang C.L. et al (2001), Hussein

(2004), Katz (2001) agree that IT Infrastructure are influential in determining the success of IT adoption and implementation.

**Table 4.36: Coefficients for regression for all Variables**

Model	Coefficients <sup>ab</sup>		
	B	T	Sig.
IT Policy Framework	.029	.340	.734
IT Implementation Procedure	.115	1.416	.160
IT Literacy	.267	4.183	.000
IT Infrastructure	.318	3.397	.001
a. Dependent Variable: Improvement of HR Function			
b. IT Policy Framework, IT Implementation Procedure, IT Literacy, IT Infrastructure			

Though from the coefficients for regression for all variables indicated that IT Policy Framework and IT Implementation Procedure were insignificant, in arriving at the final model all the four variables IT Policy Framework, IT Implementation Procedure, IT Literacy and IT Infrastructure were retained as follows.

$$\hat{Y} = 0.29X_1 + 0.115X_2 + 0.267X_3 + 0.318X_4$$

Where,  $Y$  = Improvement of HR Function

$X_1$  = IT Policy Framework

$X_2$  = IT Implementation Procedure

$X_3$  = IT Literacy

$X_4$  = IT Infrastructure

This was justified because of the fact that the combined model summary of IT Literacy and IT Infrastructure explained 73.1% illustrated in Table 4.38 which is less than the combined model summary of all variables that explained 74.3%. Therefore, IT Policy Framework and IT Implementation Procedure explained the difference between 74.3% and 73.1% which is 1.2%.

**Table 4.37: Model Summary for Regression IT Literacy and IT Infrastructure**

R	R Square <sup>b</sup>
.855 <sup>a</sup>	.731
a. Predictors: IT Literacy and IT Infrastructure	
b. Dependent Variable: Improvement of HR Function	

Although there seems to be weak direct relationship between IT Policy Framework and IT Implementation procedure to Improvement of HR Function the two have a role to play. Eason (1988) argues that the strategic application of IT depends on conceiving of ways in which the technology can be harnessed to serve major organizational objectives and this can only happen if there is an IT Policy Framework in place which according to Wheelen and Hunger (2004) policies makes the implementation of specific strategies easier. On the other hand, an implementation procedure strategy needs to take into account the crucial process issues in designing an information system as well as the factors that appear to influence success (Lukas, 2005). Therefore, it can be argued that for the relationship to be there and remain strong between IT Literacy and IT

Infrastructure with Improvement of HR Function there is need to have IT Policy Framework and IT Implementation Procedure.

## **CHAPTER FIVE**

### **5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

The researcher summarizes the findings and their implications under the following subsections; IT policy Framework, IT implementation procedure, IT Literacy and IT infrastructure, areas of IT adoption and Improvement of Human Resource Function. Further major conclusions that can be drawn from the study are also mentioned followed by key recommendations and suggestions for further research.

#### **5.2 Summary of Findings**

The study aimed at investigating the effect of IT policy Framework, IT implementation procedure, IT Literacy and IT infrastructure on Improvement of Human Resource Function in Kenyan Public Universities. It was hypothesized that there was no linear relationship between the above named independent variables and improvement of Human Resource function. For the purposes of investigating the objectives this study used Descriptive, Pearson product moment Correlation and regression analysis find out the relationship between independent and dependent variables.

A total of 118 questionnaires were analyzed in this study which were responses sampled from the Human Resource Function Employees in the seven Kenyan Public Universities. Results findings indicate that majority of the respondents were male and had worked for more than 9 years in the HR function. This is confirmed by their ages where the majority

ranged between 38-48 years. From the descriptive analysis it can be concluded that the level of IT adoption in Human Resource Function in Kenyan public Universities is low in all Human Resource Function activities namely Human Resource Planning, Recruitment and Selection, Training and Development, Performance Management, Industrial Relations and Human Resource Record keeping.

### **5.2.1 The effect of IT Policy Framework on Improvement of Human Resource Function in Kenyan Public Universities**

Although there is evidence of existence of IT Policy Framework and IT Implementation Procedures in all Kenyan Public Universities the level of awareness and understanding on what they both entail and contain is low among Human Resource Function employees in all the Kenyan Public Universities. The responses on specific IT Policy Framework questions confirm this for example majority of respondents are not sure whether the IT policy framework is adequate in enabling successful IT adoption in for improving HR function and disagree that it applies to all users. On whether the IT policy contains enforcement procedures the respondents, indicates ways of further development, details on proper authorization to access IT systems, rules for use of personal computers and indicates rules on repairs and maintenance majority disagree.

On the other hand, though the Pearson product moment correlation indicated a negligible relationship between IT Policy Framework and Improvement of HR Function due to IT adoption. The model summary for regression results indicated that IT Policy Framework

explains 0% of the variance of Improvement of HR Function due to IT adoption. In addition, there is no linear relationship between IT Policy Framework and Improvement Human Resource Function. The study findings noted that well written IT Policy Framework has been in existence in most of the Kenyan Public Universities but are not put into use since there is very low adoption of IT in Human Resource Function.

### **5.2.2 The effect of IT Implementation Procedure on Improvement of Human Resource Function in Kenyan Public Universities**

Just as in the case of IT Policy Framework the respondents are not aware of the IT implementation procedures established within the Kenyan Public Universities and specifically in the Human Resource Department. This is confirmed by the high number of respondents who are not sure on the existence of well defined formal procedure of changing from manual systems to IT systems and whether introduction of IT systems is well planned and organized.

On the other hand, the Pearson product moment correlation indicated a negligible relationship between IT Implementation Procedure and Improvement of HR Function due to IT adoption. The well written Implementation procedures are not put into use as indicated by the low levels of IT adoption in Human Resource Function activities. The model summary for regression results indicated that IT Implementation procedure explains 1% of the variance of Improvement of HR Function due to IT adoption. In

addition, there is no linear relationship between IT Implementation Procedure and adoption of IT for Improving Human Resource Function.

### **5.2.3 The effect of IT Literacy on Improvement of Human Resource Function in Kenyan Public Universities**

The importance of IT Literacy to improvement of HR Function due to IT adoption cannot be under estimated since it is the most significant factor to Improvement of Human Resource Function when compared with IT Infrastructure, IT Implementation Procedure and IT Policy Framework. Pearson product moment correlation indicated a strong relationship between IT Literacy and Improvement of HR Function due to IT adoption. The model summary for regression results indicated that IT Literacy explains 68.4% of the variance of Improvement of HR Function due to IT adoption. In addition, there is significant positive linear relationship between IT Literacy and adoption of IT for Improving Human Resource Function.

However the situation in Kenyan Public Universities is worrying since majority agree that the level of IT literacy is insufficient to enable IT adoption in HR function and further majority agree that they lack confidence in carrying out HR activities using IT, selecting appropriate IT technology, lack confidence that they have the necessary skills to use IT in HR function activities and lack confidence in helping other employees to solve IT problems. This can be attributed to the fact that there is lack of management support towards training and development on IT related subjects. The study findings according to the majority revealed that HR function within Kenyan public universities



has not organized IT training for its employees and those employees who have undergone IT training did it without assistance of their organization.

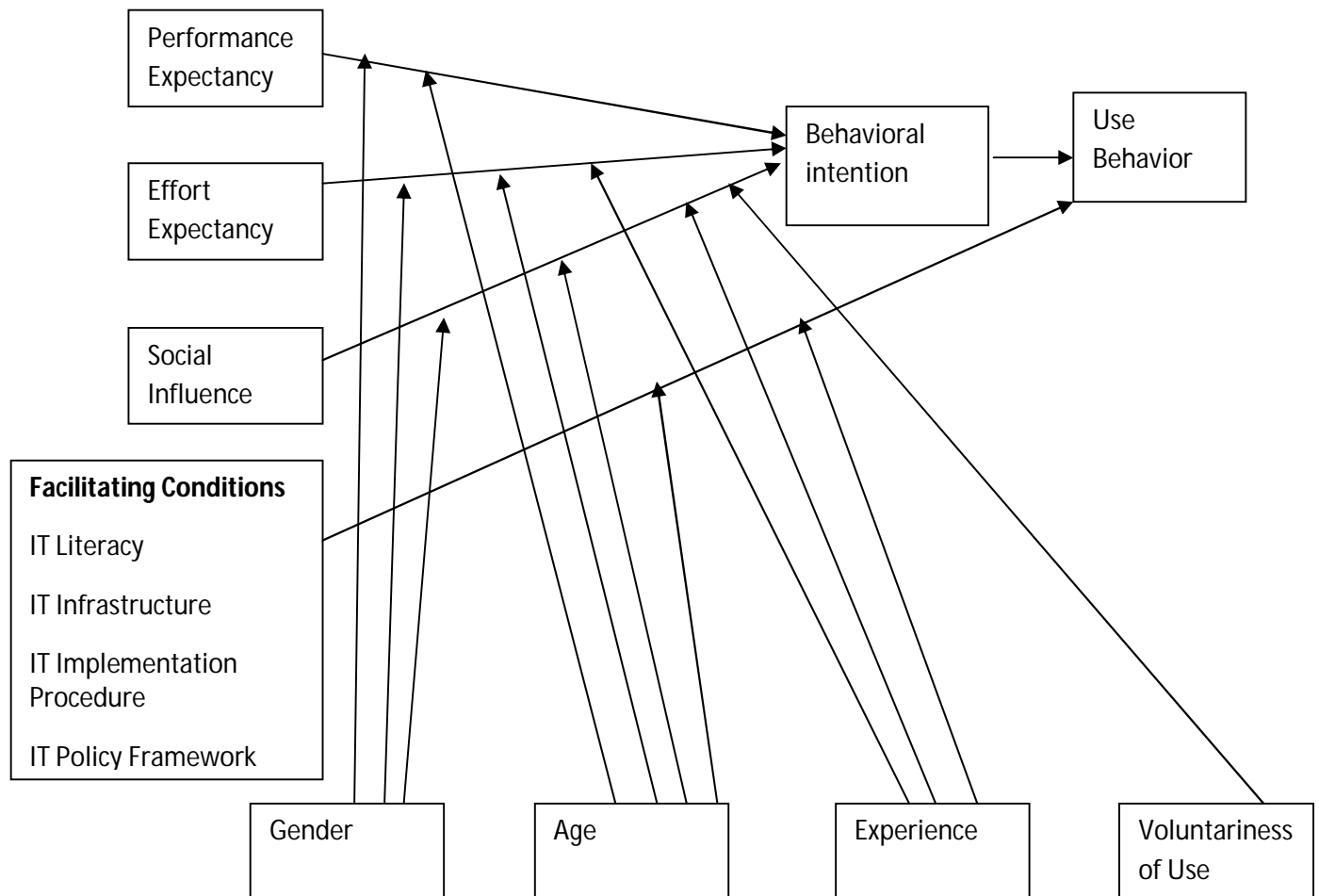
#### **5.2.4 The effect of IT Infrastructure on Improvement of Human Resource Function in Kenyan Public Universities**

The study findings indicate inadequacy of IT Infrastructure which clearly affects the adoption of IT for improving Human Resource Function in Kenyan Public Universities. Specifically from the analyses of the data majority of respondents disagree that IT infrastructure is sufficient to enable adoption of IT for improving HR function. This is confirmed by majority who disagree with the sufficiency of availability of IT telecommunication systems, availability of IT multimedia systems, availability of IT data base system, availability of IT documents systems, availability of electronic mail and/ or fax servers, availability of HR function network connected to university IT network and IT access tools.

On the other hand, the Pearson product moment correlation indicated a strong relationship between IT Infrastructure and Improvement of HR Function due to IT adoption. The model summary for regression results indicated that IT Infrastructure explains 62.1% of the variance of Improvement of HR Function due to IT adoption. In addition, there is significant positive linear relationship between IT Infrastructure and Improvement in Human Resource Function. Many studies have shown that IS facilities are influential in determining the success of IS adoption and implementation Ang C.L. et al. (2001), Hussein R. (2004). Therefore adoption of information technology on Human Resource function cannot take place without the availability of technological assets which come in various forms.

### 5.3 Contribution of Study to Theory

The figure 5.1 indicates proposed improvements on the Unified Theory of Acceptance and Use of Technology (UTAUT) Theory which originally did not list the facilitating Conditions for Technology use behavior. This study proposes that the facilitating Conditions are IT Literacy being the most important then IT Infrastructure followed by IT Implementation Procedure and finally IT Policy framework as the least important.



**Figure 5.1: Improvement on Unified Theory of Acceptance and Use of Technology (UTAUT) Theory**

## 5.4 Conclusion

In the current study the researcher aimed at finding out whether IT Policy Framework, IT Implementation Procedure, IT Literacy and IT Infrastructure are the facilitating conditions for technology behavior use. This was developed from the Unified Theory of Acceptance and Use of Technology (UTAUT) which mentions facilitating conditions as factors for technology behavior use. Facilitating conditions (FC) represents organizational and technical support and is typically significant in both voluntary and mandatory setting. Although the correlation between two Independent variables that is IT Policy Framework and IT Implementation procedure and dependent variable (Improvement of Human Resource Function) were found to be insignificant to improvement of HR Function while IT Literacy and IT Infrastructure were noted to be positively significant to the improvement of the HR Function, the model summary for all variables showed the four variables played a role in improvement of Human Resource Function due to adoption of IT. The model summary for regression results indicated when the four independent variables combined that is IT Policy Framework, IT Implementation Procedure, IT Literacy and IT Infrastructure explains 73.4% of the variance of Improvement of HR Function due to IT adoption.

Therefore, organizational and technical support that Kenyan Public Universities need to invest in to encourage behavior use of technology (Information Technology) in order of importance are IT Literacy as the most important followed by IT Infrastructure, then IT Implementation Procedure lastly IT Policy Framework. From the study findings we can

conclude that the existence of well written IT Policy Framework and documentation of proper IT implementation procedure alone will not translate into improving the Human Resource Function. Improvement of Human Resource Function can only happen when the IT Policy Framework and IT Implementation Procedure are merged with IT Literacy and IT Infrastructure.

### **5.5 Recommendations**

The level of utilization information Technology in the Kenyan Public Universities in the Human Resource Function is low in all the six HR department activities studied namely HR Planning, Recruitment and Selection, Training and Development, Performance Management, Human Relations and HR Record Keeping. This has made it almost impossible for the Human Resource Department to reap the full benefits of adopting Information Technology such as reduction of running HR function costs, increased effectiveness, labour and time-saving, improvement of quality, easier communication and connectivity among many others. The study found out that the reason for this sorry state is low literacy levels, lack of Information Technology Infrastructure, Lack of implementation procedures and policy framework.

Basing on this the researcher recommends the following to the Kenyan Public Universities. First, there is need to diversify the use of Information Technology in the Human Resource Department in all the seven public universities. This will enable the Universities to efficiently and effectively run Human Resource Management matters and many more benefits. Secondly since one of the challenges facing Kenyan Public Universities is lack of Policy for adoption of IT in Human Resource Function there is

need to develop one. Further, there is need to ensure the involvement of all stakeholders in IT Policy formulation, Implementation and Development to promote awareness among them.

In addition to formulation of IT Policy for adoption of IT in Human Resource Function there is need to have a well-planned and organized procedure of implementing IT in Human Resource Function.

The study findings indicate that Information Technology Literacy is the most important factor in IT adoption in Human Resource function in Kenyan Public Universities. This being the case there is need for management to facilitate and support IT training among employees working in the HR function. The training should be geared towards enhancing the skills and knowledge of employers on how to integrate IT in Human Resource Management activities. Since skills in IT only will not necessarily lead to improvement of Human Resource Function. Finally, the second most important factor in IT adoption as per the study was IT Infrastructure therefore there is need to invest in IT Infrastructure within the HR Function to boost the adoption of information Technology. The IT facilities should include among others systems telecommunications. Multimedia, databases, electronic mail and / or fax, network and access tools.

## **5.6 Recommendations for Further Research**

Since the study utilized the multiple linear regression analysis model there is need for a similar study to be conducted using other models such as the ordinal regression model to determine whether similar or different results will be obtained. In addition to this the researcher only used one data collection instrument which was a closed-ended

questionnaire there is need to explore the use of other instruments such as interview schedules, experimentation, observation among others.

Secondly, this study was done in the Human Resource Function in the Kenyan Public Universities there is need to conduct a study in other organizations more so those that have adopted best practices in Human Resource Management. Further, Replication of the same study in other departments within the Kenyan public universities to find out if similar findings will be obtained and further a comparative study between public and private universities.

Finally, the study focused only on IT policy, IT implementation, IT Literacy and IT Infrastructure as the facilitating conditions for IT adoption. There is need to conduct a study that will capture other factors which are considered important in adoption of IT to further improve on the Unified Theory of Acceptance and Use of Technology (UTAUT) theory.

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## APPENDICES

### Appendix 1: Questionnaire Cover Letter

I am Robert Kinanga a PhD student at Jomo Kenyatta University of Agriculture and Technology undertaking a study on **Determinants in Adopting Information Technology For Improving Human Resource Function in Kenyan public Universities**. In answering the questions provided you are assured that your responses will be kept confidential and the answers are intended for this research only. This questionnaire contains sub-sections kindly read each question carefully and give your appropriate answers.

Your contribution will be highly appreciated and upon request you can get a copy of this research work.

Yours sincerely,

Kinanga Robert.

## **Appendix 11: Questionnaire for HR department Employees**

### **SECTION A: DEMOGRAPHIC FACTORS**

Indicate your Gender by ticking appropriately.

Male ☐

Female ☐

How many years have you worked in the Human Resource Department?

Below one year ☐

1-3years ☐

3-6 years ☐

6-9 years ☐

Above 9 years ☐

Indicate your age by ticking appropriately.

18-28 ☐

28-38 ☐

38-48 ☐

48 and Above ☐

## SECTION B: AREAS OF ADOPTION OF IT IN HR FUNCTION

Indicate the extent to which IT is applied in the following Human Resource Management Practices. Tick (✓) the appropriate number.

Key: 1: Not applied, 2: Less Applied, 3: Not Sure, 4: Fairly applied, 5: Most applied

Item	Level of your Opinion				
	1	2	3	4	5
HR planning					
Recruitment and Selection					
Training and Development					
Performance Management					
Human Relations					
HR Record Keeping					

## SECTION C: INFORMATION TECHNOLOGY POLICY

To what extent do you agree with the following statements on Information Technology Policy? (Mark on a scale of 1-5) 1- strongly Disagree, 2-disagree, 3- not sure, 4- Agree, 5- strongly Agree.					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
There is an IT policy manual to be followed while adopting Information Technology in Human Resource Function					
The Human Resource function employees are aware of the University IT policy					
The University Policy on ICT is adequate in guiding adoption of Human Resource Function					
The information Technology policy applies to all users of IT systems in the university					
The policy sets for the general parameters of appropriate use of IT systems					
The IT policy indicates the enforcement procedures incase of inappropriate use of IT systems					
The IT policy indicates ways in which the policy can be further developed					
The IT policy indicates details about proper authorization in order to access IT systems					
The IT policy indicates rules and regulations on use of personal computers on the network					
The IT policy indicates how the IT systems are to be repaired and maintained					

**SECTION D: INFORMATION TECHNOLOGY IMPLEMENTATION  
PROCEDURE**

To what extent do you agree with the following statements on Information Technology implementation procedure? (Mark on a scale of 1-5) 1- Strongly Disagree, 2-Disagree, 3- Not Sure, 4- Agree, 5- Strongly Agree.					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The Human Resource function has started the process of changing from the manual system to Information Technology system					
The introduction of IT system in the HR function is well planned and organized					
There is top management support in the implementation of IT in Human Resource Management practices.					
The HR function has come up with procedures to be followed while introducing IT systems.					
There exist infusion of organizational goals and missions into the process of implementing IT in HRM Practices					
The management have committed organizational resources to the implementation of IT in HRM practices					
The process of implementing IT in HRM practices is an all inclusive exercise.					
The IT implementation procedure has measurable objectives					
The IT implementation has a clear timeline with completion targets					
There is a Human Resource function employee who has been assigned the duty of managing IT systems adoption in HR function					

## SECTION E: INFORMATION TECHNOLOGY LITERACY

To what extent do you agree with the following statements on Information Technology Literacy factors? (Mark on a scale of 1-5) 1- Strongly Disagree, 2-Disagree, 3- Not Sure, 4- Agree, 5- Strongly Agree.					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The management has organized IT training in order to facilitate adoption of IT in HR function					
I have undergone training on Information Technology system without the assistance of my organization					
The management has circulated IT manuals to enable HR employees to successfully adopt IT in HR functions					
The level of Information Technology Literacy in the Human Resource function is insufficient to enable adoption of IT.					
I lack confidence that I can carry-out HR activities with appropriate IT					
I lack confidence that I can select appropriate IT to carry out my HR duties					
I lack confidence that I have the necessary skills to use IT in HR functions					
I lack confidence that I can effectively use IT in my HR duties					
I lack confidence that I can help fellow employees if they have a problem with IT.					

## SECTION F: INFORMATION TECHNOLOGY INFRASTRUCTURE

To what extent do you agree with the following statements on IT Infrastructure within the HR function in your organization. (Mark in a scale of 1-5) 1- Strongly Disagree, 2- Disagree, 3- Not Sure, 4- Agree, 5- Strongly Agree.					
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The availability of IT infrastructure is sufficient for adoption of IT in HR function					
The availability of IT telecommunications systems which is used for facilitating voice communication is sufficient					
The availability of IT multimedia systems which is used for providing access to training material, multimedia textbooks, and library materials is sufficient					
The availability of IT database systems which is used for maintaining the institution's dynamic data manipulated by administrative systems is sufficient					
The availability of IT documents systems which is used for storing static information about the university in either text or image is sufficient					
The availability of Electronic mail and / or fax servers which is used for internal communication in the Human Resource function is sufficient					
The availability of HR IT network helps in providing efficient and convenient access to computing and information resources and facilitating the exchange of any type of information					
The availability of Information access tools is used to allow users to search databases, discover relationships, and interrogate data to find meaningful information.					



## SECTION G: IMPROVEMENT OF HR FUNCTION DUE TO IT ADOPTION

Please indicate the extent to which you agree with the following statements on improvement of HR function due to Information Technology adoption in the HR department in your organization. (Mark in a scale of 1-5). 1- Strongly Disagree, 2- Disagree, 3- Not Sure, 4- Agree, 5- Strongly Agree.

Item	1	2	3	4	5
Adoption of IT in HR function has lead to reduction of running HR function costs					
Adoption of IT in HR function has lead to increased HR function effectiveness					
Adoption of IT in HR function has lead to streamlining of HR activities					
Adoption of IT in HR function has lead to labour and time-saving in the HR department					
Adoption of IT in HR function has lead to improvement of quality					
Adoption of IT in HR function has lead to rapid response leading to faster decision making					
Adoption of IT in HR function has lead easier communication					
Adoption of IT in HR function has lead to global market connection					
Adoption of IT in HR function has lead to improved knowledge base of HR department employees					
Adoption of IT in HR function has lead to easy connectivity of HR department with other departments within the organization					

**Appendix III: List of Public Universities in Kenya as per 2011**

<b>University of Nairobi</b>
<b>Kenyatta University</b>
<b>Moi University</b>
<b>Egerton University</b>
<b>Jomo Kenyatta University of Agriculture and Technology-JKUAT</b>
<b>Maseno University</b>
<b>Masinde University of Science and Technology</b>

#### Appendix IV: Sample Size for A Given Population Size

**Table 1: Table for Determining Minimum Returned Sample Size for a Given Population Size for Continuous and Categorical Data**

Population size	Sample size					
	Continuous data (margin of error=.03)			Categorical data (margin of error=.05)		
	alpha=.10 $t=1.65$	alpha=.05 $t=1.96$	alpha=.01 $t=2.58$	p=.50 $t=1.65$	p=.50 $t=1.96$	p=.50 $t=2.58$
100	46	55	68	74	80	87
200	59	75	102	116	132	154
300	65	85	123	143	169	207
400	69	92	137	162	196	250
500	72	96	147	176	218	286
600	73	100	155	187	235	316
700	75	102	161	196	249	341
800	76	104	166	203	260	363
900	76	105	170	209	270	382
1,000	77	106	173	213	278	399
1,500	79	110	183	230	306	461
2,000	83	112	189	239	323	499
4,000	83	119	198	254	351	570
6,000	83	119	209	259	362	598
8,000	83	119	209	262	367	613
10,000	83	119	209	264	370	623

NOTE: The margins of error used in the table were .03 for continuous data and .05 for categorical data. Researchers may use this table if the margin of error shown is appropriate for their study; however, the appropriate sample size must be calculated if these error rates are not appropriate. Table developed by Bartlett, Kotrlik, & Higgins.

**Source: Adopted from Bartlett, Kotrlik and Higgins (2001)**