

**DETERMINANTS OF HUMAN RESOURCE  
INFORMATION SYSTEMS USAGE IN THE TEACHERS  
SERVICE COMMISSION'S OPERATIONS IN KENYA**

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AGRICULTURE AND TECHNOLOGY**

**2016**

**Determinants of Human Resource Information Systems Usage in the  
Teachers Service Commission's Operations in Kenya**

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**A Thesis Submitted in Partial Fulfillment for the Degree of  
Doctor of Philosophy in Human Resource Management in  
the Jomo Kenyatta University of Agriculture and  
Technology**

**2016**

## DECLARATION

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

Signature \_\_\_\_\_ Date \_\_\_\_\_

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This thesis has been submitted for examination with our approval as University Supervisors.

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## **DEDICATION**

To my dear parents, the late Nathan Warui and my late mothers Ketura and Phoebe.  
You were of one accord; with education, your children could never go wrong. To  
my family... you are priceless.

## **ACKNOWLEDGEMENTS**

I would like to express my special gratitude to my supervisors, Professor Elegwa Mukulu and Dr Kabare Karanja for their invaluable guidance, assistance and patience in walking with me through the whole journey of this thesis.

I also want to thank my family, for love, support and understanding. It was comforting to know you were always there for me. My sincere gratitude also goes to all my friends who offered a shoulder for me to lean on, prayers and moral support. I cannot forget colleague students for encouragement and moral support. I would also wish to acknowledge JKUAT for giving me the opportunity to take the PhD program.

To the living God, the giver of all good things, the one who causes me to triumph be the glory, honor and praise!

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## **ABBREVIATIONS AND ACRONYMS**

<b>Adop</b>	Adoption
<b>CSS</b>	Communication Support Systems
<b>DSS</b>	Decision Support Systems
<b>EDS</b>	Electronic Data Processing
<b>EEE</b>	Effect of External Environment
<b>ESS</b>	Executive Support Systems
<b>HRIS</b>	Human Resource Information System
<b>HRMS</b>	Human Resource Management Systems
<b>HRP</b>	Human Resource Planning.
<b>ISO</b>	Internal Structure of the Organization
<b>Mgt</b>	Management
<b>MIS</b>	Management Information System
<b>QS</b>	Quality success
<b>SPSS</b>	Statistical Package for Social Sciences
<b>TSC</b>	Teachers Service Commission
<b>UNESCO</b>	United Nations Education, Scientific and Cultural Organization.
<b>TMIS</b>	Teacher Management Information System

## DEFINITION OF TERMS

**Coercive pressures:** Are a set of formal or informal forces exerted on organizations by other organizations. It stems from political influence and organizational legitimacy often conveyed through laws, regulations, and accreditation process or outside agency requirements. (Soares-Aguiar & Palma-Dos-Reis, 2008)

**Environmental Pressure:** Adoption of innovation by organizations in reaction to an external demand or to achieve an advantage of an environmental opportunity Often it is a reaction to deal with competitors. (Damanpour & Schneider, 2009)

### **Human Resource Information**

**System (HRIS):** A computer system used to acquire, store, manipulate, analyze, retrieve and distribute information related to human resources. (Kovach & cathcart, 2002)

**Isomorphic Pressure:** A constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions Organizations compete not just for resources and customers but also for political power and institutional legitimacy, for social as well as economic fitness (Phelps & Kent 2010).

**Management Participation:** Managers and leaders' attitude and involvement in designing and developing HRIS with the help of IT professionals and ensuring that HRIS is accepted in an organization. (Soares- Aguiar & Palma-Dos- Reis, 2008)

- Mimetic Pressures:** Is when firms adopt a practice or innovation imitating competitors. It is copying or mimicking behavior that is as a result of organizational response to uncertainty. (Soares- Aguiar & Palma- Dos- Reis, 2008)
- Normative Pressures:** Come from dyadic relationships where companies share some information, rule and norms. These are pressures brought about by professions. People from the same educational backgrounds approach problems in much the same way. Socialization on the job reinforces these conformities. (Soares- Aguiar & Palma- Dos- Reis, 2008)
- Usage of HRIS:** Application of HRIS three level continuum, namely electronic data processing, management information system and decision support system (Kovach & Cathcart, 2002)

## ABSTRACT

Human Resources and information technology are the two elements that many firms are learning to use as strategic weapons to compete. To capitalize on the synergy between these two assets, human resource information systems (HRIS) is an area that has emerged and seeks to propel human resource management into a new era. However, there is limited usage of information systems in operations of many organizations in Kenya, especially in human resource management. One such organization is the Teachers Service Commission (TSC). The study sought to investigate the factors that affect the usage of HRIS in TSC in Kenya. The Human Resource (HR) function is still a support function in TSC that provides services to its internal customers. The research investigated how various variables influenced the level of usage of HRIS in the operations of the TSC. It employed explorative research design and the study population was the secretariat staff of the TSC across Kenya. Purposive stratified sampling was used to select the sample for the study. Data was collected using a self-administered questionnaire. Descriptive statistics were used to present responses in means. Multiple regression and Analysis of Variance were employed to test the hypotheses and linear relations. The study found out that management support, infrastructure and internal structure of the organization affected the usage of HRIS in the operations of TSC across the country. The study concludes that improved management support, infrastructure, and internal structure of the organization enhanced usage of HRIS. Recommendations included management giving more support in terms of providing ICT infrastructure; review the internal structure to enhance service delivery. Staff should be sensitized on the use of HRIS and HRIS be integrated with other directorates. Lastly, TSC should endeavour to equip and interconnect the county offices with the headquarters so as to improve service delivery in the whole country



## **CHAPTER ONE**

### **INTRODUCTION**

The chapter discusses the background of the study, statement of the problem, objectives of the study, and research hypotheses. It also discusses justification, limitations and the scope of the study.

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

This study sought to investigate the determinants of HRIS usage in operations of Teachers Service Commission in Kenya. There is now no doubt about the strategic role Human Resource can play in organizations and it is now generally accepted that the more strategic the approach to human resource management (HRM), the greater the contribution of HRM to organizational performance. This is because HRM powerfully impacts on the policies, practices and systems that influence employees' behavior, attitude and performance (Gloet & Berrell, 2003). Yet, there is more rhetoric than reality about the exact role HRM is being allowed to play in organizational performance in Africa. A casual look shows that though the HRM officer has finally got a seat at the high table with top management in some countries like Kenya, there is still more to be done to empower them to enable them talk strategy, globalization and customer issues that affect HR and the business.

Human Resources (HR) and information technology are the two elements that many firms are learning to use as strategic weapons to compete. The Vision 2030 economic reform progress initiated by the government of Kenya is aimed at turning Kenya into a middle level income country. It incorporates ICT as a social economic force under the economic pillar for driving development among other sectors.

The government's key objective is to turn Kenya into a global ICT hub and a premier location for business process outsourcing (BPO). This led to the formation of the current ICT board in 2007 (Musimba, 2010). To capitalize on the synergy between these two assets, human resource information systems (HRIS) is an emerging area that may lead human resource management into a new era. Technological developments and particularly those based on advancing IT, are essential for organizational effectiveness and are powerful drivers of organizational change (Mullins, 2007). TSC has grown tremendously since its creation through an act of parliament cap 212 in 1967 in terms of the teacher population it serves, as well as its secretariat staff. Recently it was made a constitutional office through an act of parliament 237(1) of 2012. It is therefore expected to improve service delivery to its customers. Being the biggest employer in eastern and central Africa means it manages a massive payroll. The HR issues it has to manage lead to a lot of correspondences in a day. The introduction of HRIS in the organization can improve efficiency and in consequence reduce the amount of correspondences and clients visiting the commission at any given time. Worth noting is the commission introduced ICT department in 2003 but the paper work is still a lot. This therefore calls for adoption of computer based HRIS systems for maintenance of employee related data and generating appropriate HR reports (Tripathi, 2011). However the current scenario is that there is minimal implementation and usage of HRIS and therefore the rationale of the study.

HRIS has been quite widespread in the developed world since the 1980's. Before the 1960s, the computer systems had a very limited purpose in human resource management and were used only to monitor employee records and payroll activities.

The system concerned itself with automating systems such as payroll and personal information with little or no attempt to make such data interactive or available to staff outside the HR department. It was too expensive, unfriendly and lacking enough capacity to manage large amounts of information required by personnel activities. It was not sufficient to create the type of internal virtual chain required to add value. In the developed world, advances in ICT has enabled automation of literally any function of HR-staffing, training and development, compensation, pay and benefits, performance management and career development (Wachira, 2010).

Human resource information systems are designed to support the planning, administration, decision-making, and control activities of human resources management. Many organizations in the developed world have gone beyond the traditional functions and developed human resource management information systems, which support the operations of human resource management. Mullins (2007) makes the following observation, ‘to make the best use of technology we must use it to support and develop the effectiveness of organizations, and not adapt business activities to the technology.’ It can therefore be argued that HRIS should help re-engineer human resources processes to maximize their effectiveness and evolve from capturing information to managing change. However in Africa HRIS is yet to be fully utilized. Even though the benefits of HRIS are yet to be fully exploited, Swaziland successfully implemented HRIS in its health sector. This was in Lubombo district. The officials had complained of low staffing levels. During planning exercise after HRIS implementation the statistics unit combined data from HRIS and HRM. The officials were surprised to find they actually had higher staffing levels than other regions. They also discovered health workers who had

transferred to other regions were still on their payroll. This situation was henceforth rectified.

Many personnel specialists in Kenya are still using the computer as no more than an electronic filing cabinet or for routine operational tasks. An exploratory survey of HRM practices carried out by the Ministry of State for Public Service in Kenya (MSPS) in 2007 found out that the day to day work of HRM practitioners in the civil service revolves round activities like; commutation of leave; confirmation in appointment; preparation of the payroll, deployment of staff, attending meetings, verification of personnel data; pension matters, statutory deductions and arranging for staff training among others. In the TSC, computerization of HR information is increasingly catching management's attention. However, informal interviews with human resource practitioners reveal that obstacles exist, ranging from a lack of top management participation to an ignorance of HRIS. In Kenya, HRIS is rarely discussed in human resource articles and academic literature.

### **Trends of adoption of HRIS**

A report on enhancing professionalization of human resource management in the public service in Africa observes that Human Resource Information system (HRIS) has been quite widespread in the developed world since the 1980's. Before the 1960s, computer systems had a very limited purpose in human resource management and were used only to monitor employee records and payroll activities. The same report adds that the use of a wide range of ICT technologies and social media technologies has now been used to rationalize or even transform HR. It has been used to transform internal operations in order to lead to the virtualization and or leaning of

HR while simultaneously improving quality of services by transforming the traditional paper and pencil, labour intensive tasks into efficient fast response activities that enable organizations to anticipate and profit from change to create competitive advantage.

The term e-HRM was first used in the late 1990's when e-commerce was sweeping the business world. e-HRM is internal application of e-business techniques to add value to the management through more effective and efficient information flow and is a way of doing HRM. It is application of technology enabling managers and employees to have direct access to HR and other workplace services for communication, performance, reporting, team management, knowledge management and learning as well as administration applications. e-HRM consists of HR functional application, extranet applications, intranet, wireless and mobile HR applications. Current literature distinguishes three types of e-HRM: operational; relational; transformational e-HRM.

To a large extent Armstrong (2008) agrees with the above. He asserts that the basic functions of a computerized human resource system are to: hold personal details about individual employees including career history, skills and qualifications, leave and absence records, hold details about employees' jobs, including grade, pay and benefits, hours, locations, job description or role definition and produce reports summarizing different aspects of this information .

As organizations grow it becomes increasingly difficult and inefficient to rely on manual systems. This has called for change from the traditional manual management systems to computerized systems. Many firms and TSC for that matter have begun

computerizing individual tasks a system commonly referred to as use of information systems. A case in point is the customer relations management system (CRM) introduced in 2012. However there is need to fully integrate organization-wide network of HR- related data, information, services, databases, tools and transactions.

In Kenya there has been development and a roll out of HRIS by Capacity Kenya project in the health sector. This was done in April 2009. The support included establishing information and communication technology infrastructure needed to support the HRIS, developing and populating the HRIS data base and providing access to the directors and other relevant users in the HRM department, the planning department and the gender department.

### **Background of Teachers Service Commission**

The teachers service commission was established in 1967 by an act of parliament (cap 212 of the laws of Kenya) to provide services to the teachers and was mandated to perform the functions of registration, recruitment, deployment, remuneration, promotion, discipline and maintenance of teaching standards. Previously schools and the teaching force were managed by various bodies which included: churches, local authorities, district education boards and central government. The TSC act (1967) and the education act (1968) were therefore put in place to govern the education system in the country. At inception there were only 39,725 teachers serving in 6,500 educational institutions. Over the years however the number of teachers has tremendously grown to over 290,000 teachers serving in over 26,000 primary schools and over 7,500 post primary institutions.

Since then a lot of changes have taken place. The TSC was entrenched in the constitution of Kenya as an independent commission in 2010 under article 237 and later re- enacted through TSC act of 2012 (Kenya Gazette 2012). This was unlike previously where the TSC was a semi- autonomous government agency under the ministry of education. The commissions delegated its key functions to agents who included provincial directors of education, district education officers and board of governors of schools. However under the new constitution the TSC has been mandated to perform all teacher management function. Consequently it has devolved its services to the 47 counties and TSC units in the sub counties. Each county is headed by a county director.

## **1.2 Statement of the Problem**

The literature available indicates that successful HRIS implementation relies on the participation of top management (MOE Task force 2006), the support of the information systems (IS) department, the involvement of human resource leaders, the support of human resource staff, the computer knowledge of HR staff, and MIS training (Vries, 2009). The role of HRIS in organizations is underscored in a study carried out in banking industries in sampled developing countries, amongst them, the Kenya Commercial Bank (KCB) in Kenya. Harman *et al.*, (2011). HRIS was found to help the bank keep pace with the changing needs of the work force. HRIS helped the bank to efficiently manage employee records where database was used as a single source of information. Often there is conflicting information from different offices due to lack of a single source database. However whereas KCB is a public institution it is profit making unlike the TSC which is not and therefore these studies could not be generalized to cover all public institution prompting the current study.

Capacity Kenya rolled out a HRIS project in the health sector in April 2009. The purpose was to establish information and communication technology infrastructure needed to support the HRIS, developing and populating the HRIS data base and providing access to the directors and other relevant users in the HRM department, the planning department and the gender department but no studies have been carried out on why there is little usage of HRIS at TSC despite the benefits that can be realized in its service delivery that is challenged by the sheer number of employees it has to manage in terms of human resource issues. A study conducted at KRA by Mohamed (2006) indicated that HRIS enhanced performance of organizations. However this study looked into perceptions that influenced implementation of HRIS. The study also recommended further research in public organization.

Sander *et al.*, (2005) in a study on sustainability of MIS in sub Saharan Africa found that elements of local infrastructure were a serious obstacle to development of HRIS system. Operational procedures within the organizations under study were never aligned to make use of MIS database and therefore paper files continued to be used even after introduction of MIS. Despite the establishment of an ICT directorate at the organization, it has not translated to higher levels of usage of HRIS. The number of teachers who visit the commission with HR and Teacher management related issues is immense. TSC training policy stipulates that HRIS shall be used to enhance decision making in operations of the commission. However there is still a lot of paper work. Communication both inter and intra departments is done through written internal memos, circulars that are distributed to all primary and post primary institutions, not to mention the large amount of correspondences received from teachers who are distributed all over the country.

Moreover, every TSC office in the sub county, county and headquarters has a teacher's personal file. A lot of money is spent on stationery in spite of an ICT department. Many teachers visit the commission losing a lot of learning hours and consequently affecting performance of learners. In the national education sector support programme (NESSP) for 2013/2014-2017/2018 proposal the TSC targeted at automating the teacher management function through a teacher management information system whereby data would be captured at source. In addition, the Kenya vision 2030 captures ICT and education among the pillars that will drive the country in to social development. HRIS would increase efficiency of the system so that the HR issues that cause teachers to keep visiting TSC offices would be minimized. Diffusion of innovation theory and the institution theory see an institution's reason for adopting a new technology as being influenced by its competitors. Whereas this may be the case for profit making organizations, public organizations are more affected by the external environment in which the government plays a major role especially in funding, and policy frameworks. In addition, very few studies had not been carried out on the usage of HRIS at the TSC in Kenya. This study, therefore, sought to investigate the reason for this limited usage of HRIS in the operations of TSC in Kenya.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective of the Study**

The purpose of this study was to find out the determinants of usage of human resource information systems in Teachers Service Commission operations in Kenya.

### **1.3.2 Specific objectives of the study**

The specific objectives of the study were:

- i. To analyze the effects of management participation on the usage of human resource information systems in TSC operations in Kenya.
- ii. To explore the effects of infrastructure on the usage of human resource information systems in TSC operations in Kenya.
- iii. To analyze the effects of internal structure of an organization on the usage of human resource information systems in TSC operations in Kenya.
- iv. To analyze the moderating effect of external environment on the relationship between the independent variables ( management participation, infrastructure, internal structure ) and usage of HRIS in TSC.

### **1.4 Research Hypotheses**

Orodho (2005) defines a hypothesis as a proposition, condition or principle which is assumed, perhaps without belief, in order to draw out its logical consequences and by this method to test its accord with facts which are known or may be determined. The role of a hypothesis according to Orodho (2005) is to suggest explanation for certain facts and to guide in the investigation of others. The decision problem is either to accept the null hypothesis as true or reject it; accept the alternative hypothesis. The study employed a null hypothesis since it sought to prove that there was a relationship between the usage of HRIS and performance of TSC in Kenya. The null hypotheses for this study were as follows:

*H<sub>01</sub>: There is no significant association between management participation and usage of human resource information systems in TSC operations in Kenya.*

*H<sub>02</sub>: There is no association between infrastructure and usage of HRIS in TSC operations in Kenya.*

*H<sub>03</sub>: There is no association between internal structure of an organization and usage of HRIS in TSC operations in Kenya.*

*H<sub>04</sub>: There is no association between external environment and usage of HRIS in TSC operations in Kenya.*

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

This study was unique in that in developing countries the issue of technology is a challenge that many organizations would want to overcome. This study sought to investigate the factors affecting the usage of human resource information systems in TSC operations in Kenya. It was hoped that the findings would shed some light on the usage of human resource information systems in the TSC and inform policy makers in the organization so that strategic measures in terms of policies can be put in place, which may then enhance usage of human resource information systems in TSC operations in the country. Since TSC is a public organization, based on this study the government may consider making it a policy for all public organizations to adopt HRIS so as to harness the human capital. This study may also provide an important source of knowledge and reference for other employers, regarding the human resource information systems. The study explored the various factors affecting the usage of human resource information systems, it therefore would possibly help fill the gap relating to human resource departments and information

systems which had not been seriously studied in the Kenyan situation as indicated by the review of past studies.

## **1.6 Scope**

Efficient service delivery in public organizations is a pertinent issue often raised in different forums. The perceived benefits of HRIS are immense considering that HR function cuts across both the private and public sector. Nevertheless this study was specific to the Teachers Service Commission which is a public organization. The commission is the biggest public organization in the country and its offices cut across all the 47 counties with sub- county offices in each county. Its main operations are basically HR and so the subject matter of the study was applicable ‘determinants of HRIS usage in the operations of TSC in Kenya’. The research interrogated four variables: management participation, infrastructure, internal structure of the organization, external environment and their effect on usage of HRIS in operations of TSC. Considering the fact that TSC is none profit making organization, the government would seem to play a major role in its funding. Public organizations exist in an environment that has regulations and competition from other organizations and therefore the moderating variable external environment was included in the study. Unlike the developed countries HRIS has not taken root in Kenya and resulting into inadequate relevant infrastructure. Commitment of resources and whether to install HRIS or not is a strategic decision by the top management and therefore the choice of the variable; management participation in the study. Information gleaned from the few studies show there are public organizations that have attempted to adopt management information systems, the

study narrowed down to usage of HRIS at the TSC. The study mainly covered the regional offices of the TSC; at the counties and the headquarters in Nairobi.

### **1.7 Limitations of the study**

The study only focused on Teachers Service Commission. Despite the size of the organization the results may not be generalized for all public organizations or all commissions in the country. However the results were within a descriptive and contextual analysis thus giving liberty to the readers to decide whether the results can be transferable to their situation. Another limitation was unavailability of top management and the field staff. This delayed data collection taking longer than was planned.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This Chapter reviews literature that is relevant to the study from both local and foreign sources. It will specifically review theoretical framework, conceptual framework, independent variables: management participation, infrastructure and internal structure of the organization, moderating variable; external environment, and critique of existing literature and research gap.

#### **2.2 Theoretical framework**

Theories are constructed in order to explain, predict and master phenomena (e.g. relationships, events, or behavior). In many instances we are constructing models of reality. A theory is a statement capable of providing specific propositions that are sufficiently precise and yield a testable hypothesis (Saleemi, 2008).

##### **2.2.1 General systems theory**

Swanson and Holton III (2001) define Systems theory as a theory concerned with systems, wholes, and organizations. Lucey (2002) says many of the concepts of general systems theory (GST) have direct applicability to organizations and MIS. GST emphasizes that not only is it necessary to examine and analyze the individual parts of the system or organization but also it is vital that the system is viewed as a totality where the whole is greater than the sum of the parts- known as the holistic approach. Systems are made of subsystems. In an organization like a TSC the subsystems can be seen in terms of departments and sections and these parts interact and are interdependent. It can therefore be conclusively said that a system is a

collection of part unified to accomplish an overall goal. If one part of the system is removed, the nature of the system is changed as well. He further adds that systems share feedback among each of the subsystems. In an organization like TSC, inputs would include resources such as money, technologies and people. These inputs go through a process where they are planned, organized, motivated and controlled, ultimately to meet the organizations goals. The expected outcomes would be enhanced quality of life or productivity for customers. Feedback also comes from the larger environment of the organization like influences from the government, society, economics and technologies. This theory underpins the third objective in the study that seeks to analyze the effect of internal structure of the organization on usage of HRIS in operations of TSC in Kenya.

The systems theory is significant in that it can assist managers to interpret patterns and events in the work place. The theory recognizes the various parts of an organization and, in particular, the interrelations of the parts; in this study interrelation between information systems and human resource department, MIS and by extension HRIS, for the purposes of this study is supposed to enhance the running of an organization; its existence in an organization should not be an end in itself. Lucey (2002) says surveys carried out in United Kingdom and United States of America have shown that existing MIS often using advanced computer equipment, have had relatively little success in providing management with the information it needs. The typical reasons discovered for this include: lack of management involvement with the design of the MIS, narrow and inappropriate emphasis of the computer system, undue concentration on low level data processing applications particularly in the accounting area, lack of management knowledge of computers,

poor appreciation by information specialists of managements true information requirements and of organizational problems and lack of management support. This theory therefore, helps in analyzing the first objective in the study; the effect of management support in usage of HRIS in operations of TSC in Kenya.

In view therefore of defining MIS in relation to systems theory it is meant to convert data from internal and external sources into information and to communicate that information, in an appropriate form, to managers at all levels in all functions to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible. To be successful an MIS must be designed and operated with due regard to organization and behavioural principles as well as technical factors. Management must be informed enough to make an effective contribution to systems design and information. Specialists must become more aware of managerial functions and needs so that jointly, more effective MIS are developed. Lucey continues to say that management do not always know what information they need and information specialists often do not know enough about management to be able to produce relevant information for the managers they serve. The designing, implementation and operation of an MIS require commitment of large amounts of organizations funds. Accordingly it is necessary to consider these inter-relationships otherwise an organization may not function efficiently and will be slower to adapt to changing conditions, which is a primary requisite to survival. The reductionist approach ignores these vital inter- relationships by treating the individual parts as self contained entities which they are not. Zahid and Peter, (2004) suggested that there are different types of information systems used in management practices at different levels.

Transactional processing systems (TPS) are used to undertake day-to-day activities, transactions and functions at operational level. These systems help to make operational decisions such as stock control while, management information systems (MIS) are used for predicting the financial operations of the organization as well as graphical models that provide a visual illustration of the information. These systems help to make management control Decisions such as comparisons of data or budget data. On the other hand, Strategic information systems (SIS) type, provide information to senior executive managers on strategic areas of business organization's activities to aid strategic decision-making. These systems help to make strategic decisions that involve decisions based on ill-defined problem. Therefore if an organization like TSC is going to reap the full benefits of MIS and HRIS by extension then there must be cooperation and teamwork from the HR, ICT, and management.

### **2.2.2 Institutional theory**

Olivera and Fraga (2011) explain that institutional theory emphasizes that institutional environments are important in shaping organizational structure and actions. According to the institutional theory, organizational decisions are not driven purely by rational goals of efficiency, but also by social and cultural factors and concerns for legitimacy. Institutions are transported by cultures, structures, and routines and operate at multiple levels. The theory claims that firms become more similar due to isomorphic pressures and pressures for legitimacy (Olivera & Fraga, 2011). This means that firms in the same field tend to become homologous over time, as competitive and customer pressures motivate them to copy industry leaders. For example, rather than making a purely internally driven decision to adopt e-

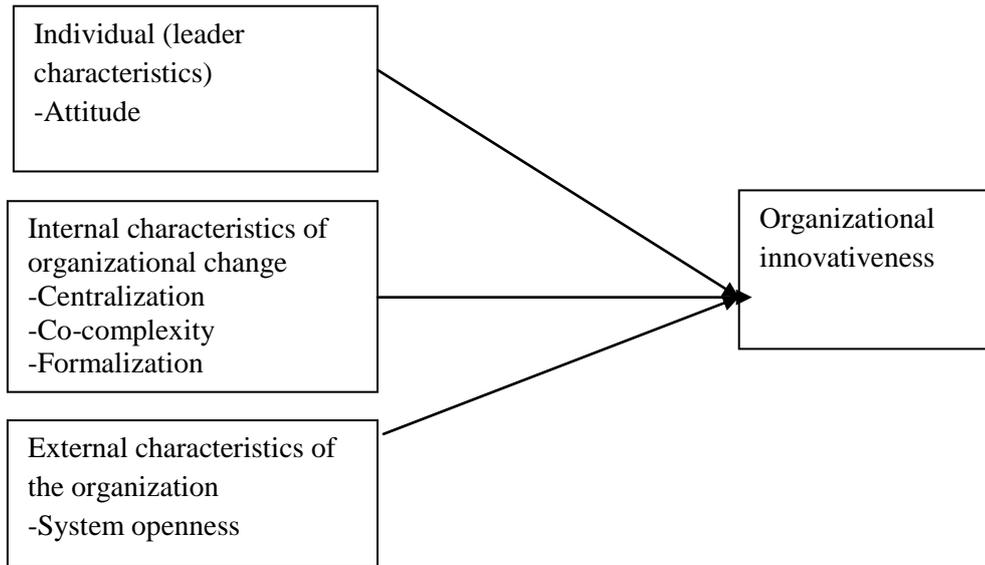
commerce, firms are likely to be induced to adopt and use e-commerce by external isomorphic pressures from competitors, trading partners, customers, and government. They go on to add that mimetic, coercive, and normative institutional pressures existing in an institutionalized environment may influence organizations' predisposition toward an IT-based inter organizational system. Mimetic pressures are observed when firms adopt a practice or innovation imitating competitors (Soares-Aguiar & Palma-Dos-Reis, 2008). Coercive pressures are a set of formal or informal forces exerted on organizations by other organizations upon which the former organizations depend. Normative pressures come from dyadic relationships where companies share some information, rules, and norms. Sharing these norms through relational channels amongst members of a network facilitates consensus, which, in turn, increases the strength of these norms and their potential influence on organizational behavior. The moderating variable, effect of external environment is underpinned on this theory, as the study seeks to find out whether the environment in which an organization operates affects usage of HRIS.

### **2.2.3 Diffusion of innovation theory (DOI)**

DOI is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. DOI theory sees innovations as being communicated through certain channels over time and within a particular social system (Tiago & Fraga 2011). They explained that individuals are seen as possessing different degrees of willingness to adopt innovations, and thus it is generally observed that the portion of the population adopting an innovation is approximately normally distributed over time. Breaking this normal distribution into segments leads to the segregation of individuals into the following five categories of

individual innovativeness (from earliest to latest adopters): innovators, early adopters, early majority, late majority, laggards. The innovation process in organizations is much more complex. It generally involves a number of individuals, perhaps including both supporters and opponents of the new idea, each of whom plays a role in the innovation-decision.

Based on DOI theory at firm level, innovativeness is related to such independent variables as internal structure of the organizational; this look in to individual (leader) characteristics, and external characteristics of the organization. Individual characteristics describe the leader's attitude toward change. In light of this study this supports the variable of management participation. Internal characteristics of organizational structure include observations whereby: "centralization is the degree to which power and control in a system are concentrated in the hands of a relatively few individuals"; "complexity is the degree to which an organization's members possess a relatively high level of knowledge and expertise"; "formalization is the degree to which an organization emphasizes its members' following rules and procedures"; "interconnectedness is the degree to which the units in a social system are linked by interpersonal networks"; "organizational slack is the degree to which uncommitted resources are available to an organization"; In the study this ties to the variable infrastructure supportive to technology adoption and level of usage. "Size is the number of employees of the organization". External characteristics of organization refer to system openness (Tiago & Fraga 2011).



**Figure 2.1: Diffusion of innovations model (source: Tiago & Fraga 2011).**

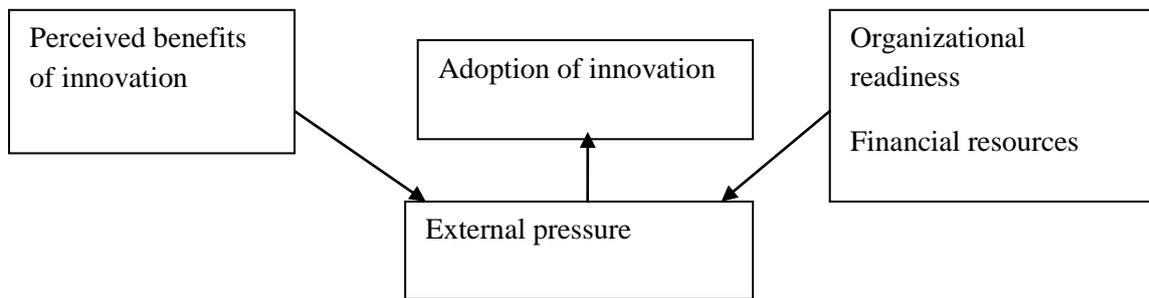
#### **2.2.4 Technology, organization, and environment framework.**

Tornatzky and Fleischer developed the TOE framework in 1990. They identified three aspects of an enterprise's context which influence the process by which it adopts and implements a technological innovation. These were primarily technological context, organizational context, and environmental context. Technological context they said describes both the internal and external technologies relevant to the firm. This includes current practices and equipment internal to the firm as well as the set of available technologies external to the firm. They further explained that organizational context refers to descriptive measures about the organization such as scope, size, and managerial structure. Environmental context is the arena in which a firm conducts its business—its industry, competitors, and dealings with the government. This framework is consistent with the DOI theory (Tiago & Fraga 2011) in which Rogers emphasized individual characteristics, and both the internal and external characteristics of the organization, as drivers for organizational innovativeness. These not only resemble the technology and

organization context of the TOE framework, but the TOE framework also includes a new and important component, environment context. The environment context presents both constraints and opportunities for technological innovation. The Kenya government is responsible for the provision of infrastructure. The Kenya government has facilitated the provision of fiber optic cables but this has not necessarily resulted to increased usage of HRIS in public institutions.

#### **2.2.5 Iacovou *et al.*, model**

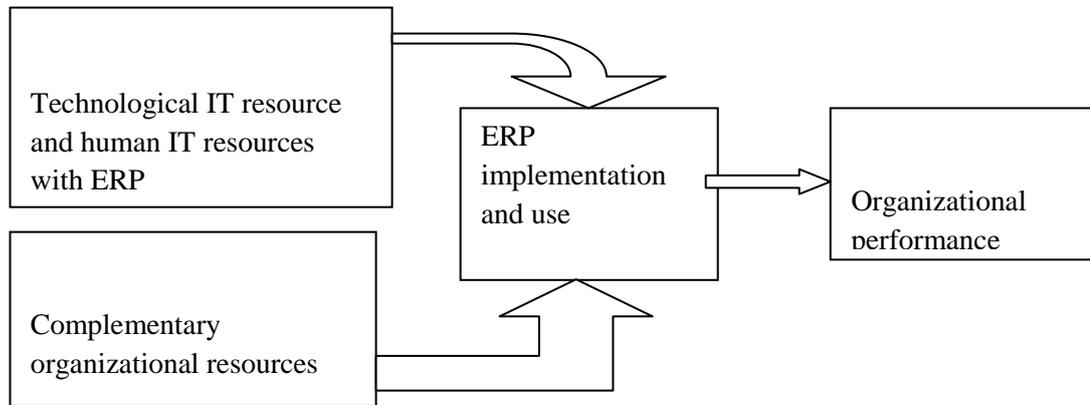
Iacovou *et al.*, (1995) analyzed inter- organizational systems (IOSs) characteristics that influence firms to adopt IT. Their framework is well suited to explain the usage of an IOS. It is based on three factors: perceived benefits, organizational readiness, and external pressure (see Figure 3). Perceived benefits are a different factor from the TOE framework, whereas organizational readiness is a combination of the technology and organization context of the TOE framework. Hence, an IT resource is similar to technology context and financial resources are similar to organizational context. The external pressure in the Iacovou *et al.*, (1995) model adds the trading partners to the external task environmental context of the TOE framework as a critical role of IOSs adoptions. Organizational readiness, financial resource, IT resources, adoption of innovation, external pressure, competitive pressure, trading partner power, perceived benefits of innovations.



**Figure 2.2: Iacovou *et al.*, (1995) model**

### **2.2.6 Enterprise resource planning (ERP) value model**

The model is built upon accumulated IT value knowledge spanning a wide range of theoretical paradigms and research methods. This integrative model of IT value; model of ERP value is built by synthesizing major findings of ERP value (Shang & Seddon, 2002). The Technology, Organization and Environment framework as originally presented, and later adapted in IT adoption studies, provides a useful analytical framework that can be used for studying the level of usage and assimilation of different types of IT innovation.



**Figure 2.3 Enterprise resource planning (ERP) value model: (Source: Shang and Seddon 2002)**

The technological IT resources include two sets: an IT infrastructure that provides the shared foundation of IT capability for building business applications and is usually managed by the information systems (IS) group. Business applications that utilize the infrastructure are such as order entry, purchasing, sales analysis, production and finance accounting systems, which actually perform the business processes and utilize the shared infrastructure services (Shang & Sheddon, 2002). The human IT resources generally comprise the training, experience, relationships and insights of its employees. The critical dimension of human IT resources include: technical IT skills, such as programming, systems analysis and design, and competencies in emerging technologies. Legacy systems management is an additional skill for ERP project (Light *et al.*, 2002).

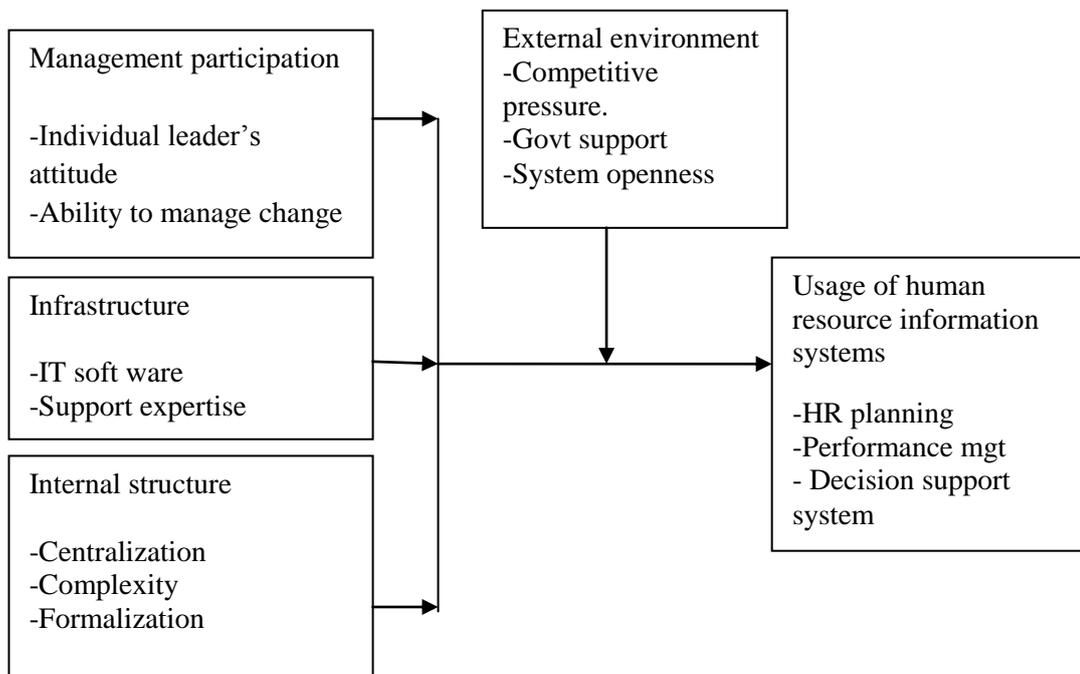
ERP implementations require that key people throughout the organization create a clear compelling vision of how the company should operate in order to satisfy

customers, empower employees, an effort and goals across business and IT personnel. A key factor for the successful implementation of ERP system requires a corporate culture that emphasizes the value of sharing common goals over individual pursuits and the value of trust between process owners, managers, partners, employees, and corporations. Management of communications education and expectations are critical throughout the organization. ERP implementation refers to the stages of systems planning, configuration, testing and final implementation. ERP use means ERP adoption or utilization. It refers to the experience of managing the operations of the systems soft ware in throughout the systems life in the post implementation stage (Nah *et al.*, 2004). Organizational performance is the aggregation of ERP enabled process- improvements with metrics capturing bottom line firm impacts.

After reviewing studies on impact of ERP systems on business performance, Shang and Seddon found out that one would expect a wide range of influences from ERP ranging from operational to strategic. Operational efficiency is usually reflected in cost reduction and productivity enhancement whereas strategic success is usually related in revenue growth and gains in market share. This model provides a framework for examining business efforts in the IT hardware, software, human capability and related organizational resources (Shang & Seddon, 2002). Since the model influences strategic decisions then TSC management participation is key. Moreover the implementation of HRIS requires commitment of organization funds.

### 2.3 Conceptual frame work

The conceptual framework reveals the relationship and linkage that exists between the independent variables and the dependent variable. The independent variables in this case include management participation, infrastructure, and internal structure of the organization which influence the dependent variable which is of usage of human resource information systems in TSC’s operations in Kenya. External environment is the moderating factor (See figure 2.1).



**Independent variables**                      **moderating variable**                      **Dependent variable**

**Figure 2.4 Conceptual Framework**

Adopted from Fraga and Oliver (2011), Tornatzky and Fleischer (1990) and Iacon *et al.*, (1995).

The conceptual framework has been adopted from previous empirical studies, theories and models. The three variables are seen as drivers for organizational innovativeness and influence the usage of HRIS in an organization; TSC in the case of this study.

#### **2.4 Determinants of HRIS**

Whether or not to use HRIS in an organization can be influenced by how management supports such a decision, the availability of necessary infrastructure and the internal characteristics of an organization. This is as shown in the institutional theory, the diffusion of innovation theory, Iacov *et al.*, model and the conceptual framework. The independent variable; management participation, infrastructure, internal structure of the organization, moderating variable i.e. external environment and the independent variable human resource information systems are underpinned on these theories.

#### **Management participation and Usage of HRIS**

Management participation refers to managers and leaders' characteristics and involvement in designing and developing HRIS with the help of IT professionals and ensuring that HRIS is accepted in an organization. It involves the managements role in ensuring that HRIS is accepted despite the resistance to change that may arise. Maumbe and Okello (2013) observed that the full use of ICT provides new avenues for resolving the problems of information asymmetry and information poverty that characterize rural areas in Africa. ICT enabled farmers to receive real time information on input product prices, weather conditions, pest infestation and related farm management extension advice. Zhu and Weyant (2003) also noted that common

benefits of technology adoption are the capability to compete in product markets at lower costs or with better efficiency. Thus, technology adoption and level of usage decisions are often made under strategic considerations or competitive pressure. In an oligopolistic industry with several competitors, adopting a new technology is a strategic decision. Implementation of HRIS is an organizational change. For any change, resistance is expected: To ensure successful HRIS implementation, context issues need to be assessed.

A number of factors are identified from the literature. Lippert and Swierz (2005) observed that HRIS brings changes to everyone's work. It is important for managers, leaders and HR professionals to be involved together when designing and developing HRIS with the help of IT professionals. This they add may cause co-operational challenge between managers, leaders and HR people. It is the prerogative of top management to ensure there is acceptance of HRIS. There are barriers associated with acceptance of new or upgraded HRIS among key end –users of the system and the importance attached to managing the change process associated with its implementation and introduction. Further, obtaining organizational 'buy-in' regarding the strategic contribution of the HRIS has been in some cases been hindered by skepticism, a lack of understanding, insufficient management commitment, and fears that existing modes of work will be changed and result in for example job loss or altered leave entitlements and shift arrangement ( Dery *et al.*, 2006).

Compare HRIS (2012) in discussing HRIS strategy implementation argues that employees, would rather be lectured and inspired by line leaders than they would by

HR. HR, meanwhile, has the power to generate opportunities to bring employees together with managers and executives, leading from behind the scenes. For successful implementation of HRIS, it is recommended there be a thorough understanding of the strategic objectives, willingness to make sacrifices in order to achieve strategy, common view regarding what parts of organization must change and commitment to a systematic plan of employee management, support, and interdepartmental relations that will cultivate efficient execution of the strategy.

Another factor that may affect the usage of HRIS is the characteristics and involvement of human resource leaders. Where management is finding difficulties in implementing HRIS it is the job of HR professionals to urge the management group to address these issues and suggest means of bringing HRIS (Compare HRIS, 2012). In addition, Dery *et al.*, (2006) observed that as organizations experience significant changes in structure, size, ownership and government this has resulted in a shift of senior management attention away from development of HRIS to move immediately pressing organizational issues and functional priorities. One consequence of this is the allocation of insufficient resources to the HRIS and, in some cases, the increased delegation of responsibilities to vendors and consultants.

In the study of four Australian universities, Dery *et al.*, (2006) noted that there was the challenge for HRM on how to manage the tension between the need to adapt practice to meet the needs of HRIS versus customizing the technology to fit existing practices and the unpredictability involved in the management of people. Associated with this challenge was the decision of where to locate the management of HRIS i.e. within information technology or as an HR technology group within HR.

Nevertheless, there was consensus that there was a significant implication for knowledge transfer from between IT and HRIS. Vries *et al.*, (2009), in evaluating capacity project's HRIS in the health sectors of three African countries i.e. Rwanda, Swaziland and Uganda, asserts that there is need to focus on concurrent professionalism of HRIS functions. To sum it up an ICT investment needs senior management commitment to provide necessary budget and support, hardware, operational training, and maintenance. In addition, Vries *et al.*, (2009), observed that the project staff observed the following in Swaziland: that, trainers perceived a general lack of basic computer literacy among many (especially senior staff). Most of them felt that the statistics unit data base fell outside their usual administrative responsibilities and were reluctant to engage the new system. To resolve the issue and emphasize the systems relevance and benefits, the local statistics development team introduced the system to the HR team in the form of a general HR workshop, identifying objectives, and then later illustrating the utility of the HRIS in providing responses. This approach of the training as a HR strategy as opposed to more technical HRIS training helped align relatively computer- illiterate personnel to HRIS. Therefore management participation is paramount in giving continuous learning and training for a successful implementation and usage of HRIS in an organization.

Obwogi (2011) underscores the importance of continuous education and training. He says an institution's competitiveness in a global or national setting will depend on the expertise of the staff. If competence of staff is continually maintained and developed, they will gain a lasting motivation. Vries *et al.*, (2009) posit that it is important to focus on concurrent professionalization of HR functions because a weak HR

department is unable to capitalize on the opportunities provided by the HRIS strengthening process, it is relevant to include strengthening of professional identity of HR goal to implement HRIS. This includes teaching the HR department how to realize the benefits of HRIS and how to analyze data. This is particularly important for staff at the HR department that typically is not well trained in strategic planning, systems thinking and data analyses. Weru (2011) in accessing factors affecting ICT skills at Kenya Revenue Authority observed that in Kenya there was generally no incentive to develop the ICT sector. The Problem was compounded by lack of research development capacities in ICT.

Since clerical staff have considerable responsibility in system operations, their support is crucial. It is therefore, expedient that they are fully equipped with the necessary skills, to work efficiently and effectively. This has to be a deliberate decision by top management in an organization. Dery *et al.*, (2006) asserts that from technologies-in- practice perspective user interactions with the facilities, norms, and interpretive schemes associated with HRIS are affected not only by its technical complexity, but also by problems concerning the management of, and commitment to, its implementation. Research has also explored several chief executive officer (CEO) characteristics that influence the IT usage. Innovation adoption is related to the innovation decision process when the knowledge of the innovation is gathered, an attitude will be formed towards the innovation as to whether to adopt or reject an innovation (Rogers, 1995). It is the top managers who make the final decision to adopt IT based on the internal needs of the organization or environmental changes (Damanpour & Schneider, 2006). The CEO also takes the responsibility of managing and use of technological innovations in organizations (Pinheiro, 2010). An

organizations strategic decision to adopt and enhance usage of ICT or reject it often reflects the personal characteristics of its top managers. The CEO's attitude and perception of new innovation plays an important role in the adoption of IT. A CEO's innovativeness and favorable attitude of new technology affects in a positive way the adoption of IT. The creation of an attitude towards an innovation happens before a decision to adopt has been made. Top managers' favorable attitude assists in all stages of adoption.

In the initiation stage, managers help developing awareness among the organizational members, in the adoption- decision stage they are responsible for allocating necessary resources and in the implementation stage they can create an environment for smooth integration into organizational settings. There is a direct link between CEO's positive attitude towards adoption of IT and success of adoption process. Every adoption process is associated with uncertainty; however a CEO with more positive attitude challenges these risks and continues to maintain their enthusiasm by committing increasing amounts of resources. Moreover a CEO with more IT knowledge is able to assess the benefits of new technology and more likely to adopt innovation.

MOE Task force (2006) recognized that integration of ICT in learning, teaching, research and management is driven by the institutional ICT policies and strategies developed by the leadership of the institutions. Experience all over the world has shown that the commitment of top leadership drives the integration of ICT in teaching, learning and management. In addition HRIS just like an ICT strategy requires heavy investment in infrastructure which translates to committing the

financial resources of an organization (MOE, 2006). NMAtec (2008) noted that there has been a mismatch between the way HR professionals have allocated their efforts and what contributes value for the organization. The greatest amount of time and costs of HR management are concentrated at administrative level. However HRIS would add more value at the strategic level; administrative activities produce a limited value for the organization.

#### **2.4.2 Infrastructure and usage of HRIS**

Immediate implementation of a mature soft ware-based HRIS is sometimes not feasible or appropriate. The required infrastructure to support the system may not be in place, or there might not be people on staff with required expertise to support it. Ryder (2005) reckons that even where the HRIS has been successfully installed difficulty in using the system due to complex or ineffective user interfaces will make alternatives to the system more attractive. Often the alternative is going back to manual system. Ease of use is critical to long term success. The web interface must be designed for ease of navigation and reflect the best practices in website design. If information is difficult to find or navigation is confusing, users will have negative early experiences and be less likely to go to the system for HR services.

Hall and Khan (2002) observed that if a successful implementation of a technology requires complex new skills, and if it is time consuming or costly to acquire the required level of competence, adoption might be slow. As a consequence the overall levels of skills available to the enterprise as well as the manner in which the necessary skills are acquired are important determinants of diffusion. Another bottleneck is that the hardware infrastructure may not be as strong as originally

believed. Indeed, implementation costs often run 150% the cost of the software and costs often run about 15% over the budget (USAID, 2011). In the study of four Australian universities, Dery *et al.*, (2006) noted that there was the challenge for HRM on how to manage the tension between the need to adapt practice to meet the needs of HRIS versus customizing the technology to fit existing practices and the unpredictability involved in the management of people. Associated with this challenge is the decision of where to locate the management of HRIS i.e. within information technology or as an HR technology group within HR. Nevertheless, there was consensus that there was a significant implication for knowledge transfer from between IT and HRIS. Vries (2006) asserts that there is need to focus on concurrent professionalism of HRIS functions and that an ICT investment needs senior management commitment to provide necessary budget and support, hardware, operational training, and maintenance.

Task force that looked into integrating ICT in education found out that ICT strategy requires heavy investment in ICT infrastructure. However it is quite expensive to establish and maintain the ICT infrastructure. The TSC has over 240,000 teachers served by 47 offices in the counties each headed by a county director. Creating an integrated network and setting up enough computers would require a tidy sum of money. Vries (2006) observed that a number of respondents identified the scarcity or unavailability of equipment and financial resources for maintaining HRIS as a barrier to sustainability. In Swaziland the HR department expressed powerlessness to persuasively articulate their HRIS budget needs and compete successfully for limited financial resources.

### **2.4.3 Internal Structure of the Organization and Usage of HRIS.**

Internal organizational structure is the particular manner in which an organization is arranged in order to achieve its goals. Managers achieve coordinated effort through the design of a structure of tasks and authority relationships. Structure refers to relatively stable relationships and processes of the organization. Organization structure is considered to be the “anatomy of the organization, providing a foundation within which the organization functions (Ivancevich *et al.*, 2006).

Internal characteristics of organizational structure include observations according to Rogers (1995) whereby: “centralization is the degree to which power and control in a system are concentrated in the hands of a relatively few individuals”; “complexity is the degree to which an organization’s members possess a relatively high level of knowledge and expertise”; “formalization is the degree to which an organization emphasizes its members’ following rules and procedures”; “interconnectedness is the degree to which the units in a social system are linked by interpersonal networks”; “organizational slack is the degree to which uncommitted resources are available to an organization”. Organizational structure may also include the assignment of tasks, supervision structure, hierarchy and other concerns affecting the way an organization is run. It may be based on the nature of goals of the organization and may also differ based on the preferences and ideas of those in charge. An organizations structure system can be based on strict hierarchical control structure while another may involve less supervision. The goal of the first would be stability and efficiency while the second likely places emphasis on creativity and flexibility.

The internal organization structure of most organizations is based primarily in arrangement and grouping of personnel to accomplish tasks. A strongly hierarchical structure is characterized by ranks in which superiors, direct actions of their subordinates toward the goals of the company. Individuals of higher ranks supervise and assign tasks to their subordinates. This structure supports the primary manner in which tasks that ultimately contribute to the goals of the organization are accomplished (Geek, 2013). It has been recently observed that government is keen on implementation of information systems in its service delivery to the public. The focus is transiting to less paper work and hence the ICT policies in most public organizations including the TSC policy of 2003. However an understanding of the characteristics of an organization such as the TSC is important in aligning the structure with HRIS adoption strategy.

#### **2.4.4 External Environment and Usage of HRIS.**

Miles and Snow (2003) state, that every organization is embedded in a network of external influences and relationships which can be labeled as its environment. The environment is not a homogeneous entity but rather is composed of complex combination of factors such as product and labour market conditions, industry customs and practices, government regulations, and relations with financial and raw material suppliers. The behaviour of certain environmental elements can be reliably predicted while that of others cannot. The impact of some conditions can be buffered while the impact of others cannot; and some factors are critical to the organizations operations while others are only incidental. Top management is charged with the responsibility of aligning the organization with its environment.

An organization adopts IT either to necessitate a demand from the environment in which it operates or a recognition from management that innovation is a requirement for their organizational functions. Among the factors considered external pressure or the demands from trading partners and potential customers were found to be most influential in the adoption process. Damanpour and Schneider, (2006) posit that organizations adopt innovation in reaction to an external demand or to achieve an advantage of an environmental opportunity.

Quaddus and Hofmeyer (2007) considered competitive pressure, government support, and vendor support as different environmental aspects in investigating the factors influencing adoption of business to business. Lin (2008), examined, government support in adoption and usage of innovation. They asserted that through regulations government can encourage the adoption of innovation in organizations. By implementing guidelines and providing financial assistance, policy makers can facilitate the adoption of IT in organizations. Government can encourage usage of IT in organizations by providing training, technical support, independent advice and incentives. An organization that adopts a particular innovation would demand their partners to possess a similar innovation process to fully utilize the innovation at an inter-organizational level. Similarly the demands from potential customers to possess an innovation have a strong impact on the adoption of IT in organizations (Aberejio, 2009).

Zhu and Weyant (2003) reckon that common benefit of technology adoption is the capability to compete in the product market at lower costs or with better efficiency. In some situations, without the new technology, the firms would not be able to

compete in the market. Therefore with several competitors adopting a new technology this creates competitive pressure. On one hand facing uncertainty about the new technology, each firm has an incentive to delay the adoption decision until it receives more information to resolve uncertainties about the new technology's cost and performance. On the other hand if it does it runs the risk that another firm may pre empt it by adopting first because technological investments often exhibit early mover advantages due to standard – setting, economies of scale, brand recognition, and other factors. Fear of pre emption by a rival creates incentives to act quickly. This dilemma is especially important when the market is volatile and future performance of the new technology is uncertain. Troshani *et al.*, (2011) underscores environmental factors by stating that in addition to various organizational factors, which includes: management commitment and human capability, the authors also find that broader environmental factors including regulatory compliance can have a deep impact on the level of HRIS usage by creating agency in adoption intentions.

Hall and Khan (2002) point out that networks effects due to technology standards are very important because there is a high degree of interrelation among technologies. A technology has network effect when the value of a technology to a user increases with the number of total users in the network. They further add, network effects in usage can arise from two different but related reasons, often characterized as direct and indirect. Direct network effects are present when a user's utility from using a technology directly increases with the total size of the network. Large firms have large market shares and are sometimes better able to spread the potential risks associated with new projects because they are able to be more diversified in their

technology choice and are in a position to try out a new technology while keeping the old one operating at the same time in case of unexpected problems.

However despite the large size of TSC, this has not worked to its advantage. The MOE's report, (2006), explained that information technology though available was minimal and generally inferior in quality. This could be a result of multiple levels of bureaucracy which can impede decision making processes about new ideas and projects and hiring of new workers (Hall & Khan, 2002).

#### **2.4.5 Human Resource Information Systems and Organizational Performance.**

Hamerman (2005) defines HRIS as a computer based application for assembling and processing data related to the HRM function. He further says, HRIS consists of a database, which contains one or more files in which the data relevant to the system are maintained, which provides the means by which users of the system access and utilize these data. Millars (2009) in a training module in records management posits that Personnel or human resource management refers to the management, both individually and collectively, of an organization's most valuable resource, the people it employs. The goal of human resource management is to attract and retain a workforce that will enable the organization to achieve its purpose and objectives.

Human resource management also involves the training and development, health and Welfare and performance improvement of each employee. In addition, it supports the organization's capacity to plan, monitor and evaluate its own performance. It follows that the creation and control of personnel records are critical to the success of an organization's operations. The effective management of

personnel records enables organizations to manage their employees efficiently and equitably, encourages informed and consistent decision making, supports transparency and accountability and facilitates the monitoring and evaluation of staff performance. All operations in relation to human resource management, from preparation of pay slips to strategic planning, ultimately depend on reliable and accurate personnel records. This is where HRIS comes in. According to Maguire and Redman (2006) HRIS shape integration between HRM and IT. These systems, they remark, may rely on centralized hardware resources operationally, with a small group of IS specialists residing within the personnel department who manage, support, and maintain them. HRIS support planning, administration, decision making, and control. The systems support applications such as employee selection and placement, payroll, pension and benefits management, intake and training projections, career patching, equity monitoring and productivity evaluation. These information systems increase administrative efficiency and produce reports capable of improving decision making.

Armstrong (2008) defines computerized human resource information system as a fully integrated, organization- wide network of HR- related data, information, services, databases, tools and transactions. Heathfield (2009) gives a more detailed definition of HRIS. She defines HRIS as a soft ware or on-line solution for the data entry, data tracking and data information needs of the HR, pay roll management and accounting functions within a business. Typically HRIS, provide overall: Management of all employee information, reporting and analysis of employee information, company related documents such as employee hand books, emergency evaluation procedures, safety guidelines and benefits administration including enrolment, status changes, and personal information updating, complete integration

with payroll and other company financial software accounting systems, and applicant tracking and resume management.

In addition the observation is that HRIS most effectively serves companies tracks attendance and use pay rises and history, pay grade and positions held, performance development plans, training received, disciplinary action received, personal employee information, and occasionally, management and key employee succession plans, high potential employee identification, and applicant tracking interviewing and selection. To sum it up she says, an effective HRIS is a system that provides information on just about anything the company needs to track and analyze about employees, former employees and applicants. From the above it is clear that HRIS aims at making management of human resources more efficient and effective. It is therefore important for TSC to select a HRIS and customize it to meet its needs.

Millers (2009) states that with the introduction of (HRIS) human resource management functions and processes are, increasingly conducted electronically. Many business processes that traditionally depended purely on the movement of paper have become partially or wholly computerized. The adoption of technology has allowed human resource managers not only to focus on purely administrative activities relating to individual employees, but also to develop well-researched strategies and plans, enabling human resource planning to be aligned directly with overall business objectives. Lawler *et al.*, (2004) is of the same opinion. He says HRIS also provide HR professionals with the opportunities to enhance their contribution to the strategic direction of the firm. First, by automating and devolving many routine HR tasks to line management, HRIS provide HR professionals with the

time needed to direct their attention towards more business critical and strategic level tasks, such as leadership development and talent management. However, the extent to which HRIS is used in strategic fashion differs across organizations, with the vast majority continuing to use HRIS simply to replace manual processing and to reduce costs (Bee& Bee, 2002). This application of HRIS at the basic level can be said to be the scenario at the Teachers Service Commission in Kenya.

Beckers and Bsat (2002) suggested five reasons why companies should use HRIS. To improve competitiveness by enhancing human resource operations, provide greater number and variety of human resource related reports, change the focus of human resource managers from the processing of transactions to strategic HRM, and enroll employees within strategic decisions by using HRIS and automating the entire human resource function of companies. The benefits of technology are not limited to strategic planning, however. Increasingly, organizations are providing their staff with direct access to human resource information through an Intranet or web portal. As a result, organizations can communicate changes in personnel policies and procedures more easily; managers can access staff records without having to keep multiple copies or wait for the delivery of a centrally held paper file; individual employees can access personal information about their work status and entitlements; and self-service facilities can be provided so that staff members can manage their own personal data. HRIS are also increasingly likely to have built in workflow and business rules to promote consistency in operations, and to allow for better monitoring (Mullins, 2009).

Considering all the above there seems to be a common view about the essential purposes of HRIS which are to store, manipulate and to provide data on employees. However, Lippert and Swierz (2005) go a step further. They say some questions can be presented when the core meaning of HRIS is evaluated. What tasks is the system for? What do managers expect of HRIS? Does the HRIS support strategic initiatives? Does it provide information – not just raw data- to support strategic decisions? How does the HRIS serve corporate needs and expectations? Furthermore, the HRIS brings changes to everyone's work. This, therefore, means that some resistance will be expected and it is upon management to ensure that HRIS is well implemented with as few casualties as possible in its wake.

Vries *et al.*, (2009) reports that before introduction of HRIS in Uganda's health sector; it had been characterized by inaccurate and inefficient information- there was no access to up- to- date information; Officers supplied data they already knew to be erroneous, records would show staff attached to same post or at wrong location. Posts were not categorized in a logical manner according to job families therefore making data difficult to use for planning purposes. In addition, records could not accommodate registrants with multiple qualifications leading to double counting .Coupled with this was slow process of retrieval of files and registration. There were also delays in paying newly recruited staff and ghost workers existed on the payroll reason being it took too long to remove those who had left service. Finally there lacked transparency in recruitment due to lots of paper work and sequence of steps involved.

All the above meant there was inadequate data for decision making. What was available was incomplete and of poor quality. This translated to inefficient human resource management. With the introduction of HRIS the outcome was; Improved data accessibility- files could be easily retrieved, HRIS provided mechanism to organize available data and make them more accessible to a larger audience, there was improved data accuracy- it made previously unknown gaps visible and could now be rectified; data entry was now much easier and more timely, the systems became more efficient by reducing time taken for various procedures, data verification was also easier with respect to promotion or appointment; HR staff could now verify employees' status and identify vacancies almost instantly, increased transparency in hiring process and improved cost effectiveness.

## **2.5 Empirical studies**

In studies by Maumbe and Okello (2013) the two observed that the full use of ICT provides new avenues for resolving the problems of information asymmetry and information poverty that characterize rural areas in Africa. ICT enabled farmers to receive real time information on input product prices, weather conditions, pest infestation and related farm management extension advice. Millers (2009) states that with the introduction of (HRIS) human resource management functions and processes are, increasingly conducted electronically. Many business processes that traditionally depended purely on the movement of paper have become partially or wholly computerized. The adoption of technology has allowed human resource managers not only to focus on purely administrative activities relating to individual employees, but also to develop well-researched strategies and plans, enabling human resource planning to be aligned directly with overall business objectives.

Another study by Vries *et al.*, (2009) on the introduction of HRIS in Uganda's health sector noted that before HRIS was employed the sector was characterized by inaccurate and inefficient information- there was no access to up- to- date information; Officers supplied data they already knew to be erroneous, records would show staff attached to same post or at wrong location. Posts were not categorized in a logical manner according to job families therefore making data difficult to use for planning purposes. In addition, records could not accommodate registrants with multiple qualifications leading to double counting. Coupled with this was slow process of retrieval of files and registration. There were also delays in paying newly recruited staff and ghost workers existed on the payroll reason being it took too long to remove those who had left service. Finally there lacked transparency in recruitment due to lots of paper work and sequence of steps involved.

Wachira (2010) explored the human resource management in African public sector through application of information and communication technologies. An exploratory survey of HRM practices carried out by the Ministry of State for Public Service in Kenya (MSPS, 2007) found out that the day to day work of HRM practitioners in the civil service revolves round activities like; Commutation of leave; confirmation in appointment; preparation of the payroll, deployment of staff, attending meetings, verification of personnel data; pension matters, statutory deductions and arranging for staff training among others.

Indrit *et al.*, (2011) explored the public sector adoption of HRIS. The findings of the study were that among the various organizational factors that impact on post adoption of HRIS includes management commitment, human capability and broad

environmental factors that comprised of regulatory compliance. Weru (2011) in accessing factors affecting ICT skills at Kenya Revenue Authority observed that in Kenya there was generally no incentive to develop the ICT sector. The Problem was compounded by lack of research development capacities in ICT. Mohamed (2006) also studied the perceived factors influencing implementation of Human Resource Information System at the Kenya Revenue Authority (KRA). Management's role was found to be fundamental in implementation of HRIS at the KRA. Top management supported HRIS by aligning it to strategic goals of the organization. However top management's committal in provision of enough resources and funds was found wanting.

Ngai and wat (2004) in reporting the results of a survey on the implementation of in Hong Kong discovered that most industries perceived that the greatest benefits to the implementation of HRIS were the quick response and access to information that it brought and the greatest barrier was insufficient financial support. Committing organizations finances is a top management decision. This therefore means individual leaders in an organization must perceive the benefits so that they can release the required funds for HRIS. There are few studies carried out in Sub-Saharan Africa on HRIS. Sander *et al.*, (2005) researched on management information system (MIS) sustainability in Gambia education department. It was discovered that elements of the local infrastructure (power supply, computer maintenance, availability of soft ware development) were a serious obstacle to the country as a whole.

## **2.6 Critique of Empirical Studies**

Empirical studies on usage of HRIS are few especially on public organizations despite the need for automation and encouragement by the government to increase the usage of HRIS in its institutions as a driver towards achievement of vision 2030. Past studies discussed touch on issues related to management participation, infrastructure, internal structure of an organization and external environment and how they affect usage of HRIS in organizations. However most of these studies are on implementation and adoption of HRIS and not usage. In Kenya, Mohamed (looked at perceptions of factors influencing implementation of HRIS. Few studies have looked into the role of government yet project sponsored by donors like in Gambia came to a standstill immediately after the donors leave.

An organization decides to adopt IT either to necessitate a demand from the environment in which it operates or a recognition from management that innovation is a requirement for their organizational function. The few studies on adoption of HRIS in Kenya and Africa explore adoption of HRIS in the Public Service Commission of Kenya and the health sector in Uganda, Swaziland and Rwanda. The diffusion of innovation theory and technology, organization and environment framework theories support these studies. The environmental demands and endeavors to create efficiency in running the health sectors of the three African countries drove them to adopt HRIS. If Wachira (2010) findings in the public service commission of Kenya are anything to go by it is clear usage of HRIS is still at transactional level in most public institutions and by extension the TSC.

## **2.7 Research Gap**

From a foregoing discussion and review of empirical studies it is fundamental that the TSC should stop relying on paper based HR systems. There is increased use of computers and introduction of information systems in many public organizations. However, the interaction of IS with human resource is limited. Information systems are mainly at operation level rather than management support systems. But despite the aforesaid, studies have mainly focused on adoption and implementation of HRIS and not usage. Mohamed (2006) conducted a study at the Kenya Revenue Authority on factors influencing implementation of HRIS. The study showed a HRIS that was already in place but its impact had not been fully realized. There is a vague understanding of implementation, adoption and usage of HRIS in public organizations in Kenya. The presence of computers or an ICT department in an organization is assumed to translate into improved service delivery by the HR. Moreover no research has been carried out in relation to HRIS at the Teachers Service Commission. Indrit (2011) observes that HRIS adoption remains an under researched phenomenon. This study, therefore, aimed at finding out what determines the usage of HRIS in TSC's operations in Kenya.

## **2.8 Summary**

From the literature review, many public organizations use HR information systems for HR administrative purposes only instead of strategic planning. General systems theory, institutional theory, and diffusion of innovation theory have been reviewed in relation to the study and were all found to be appropriate in explaining the variables under study. The conceptual framework in the study was derived from the institutional theory, diffusion of innovation theory and inter-organizational systems

model. Empirical studies were also reviewed in the literature for further exposition of the topic under study.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

This chapter discusses the methodology that was used in the study. It includes the research design, target population, sample design, data collection instruments, and data analysis techniques. It also looked at the reliability and validity of research instruments and how they were administered.

#### Research philosophy

The philosophy guiding the study was the ontological assumption which stipulates that reality is multiple and not necessarily measurable and the investigator may not be able to separate causes from effects. The assumption in this study was that reality is constantly changing and can be known only indirectly, through the interpretations of people; they accept the possibility that there are multiple versions of reality. This is what has partly informed the use of likert scale in the questionnaire. This is as opposed to positivism. Easterby-smith *et al.*, (2002) observe that the key idea of positivism is that the world exists externally, and that its properties should be measured through objective methods using quantitative approach. In the positivist paradigm the researcher sees herself as a neutral recorder which was also the case in this study.

Qualitative and quantitative research approaches were mainly used in this study. Mugenda (2008) observes that qualitative research approach operates in natural settings. Moreover this study contained the features of qualitative research in that

some of the data collected was descriptive; it was not necessarily reduced to symbols and numbers. The goal of descriptive study is to describe relevant aspects of the phenomena of interest from an individual, organizational, industry-oriented, or other perspective (Sekeran, 2003). In addition, the data collected was used to prove or disapprove hypotheses held before the study. This approach focuses on people's opinions and perceptions. Therefore, quantitative approach was also used in generalizing findings across the population under study. Moreover, some of the questions solicited numerical answers. Knox (2004) is in agreement. He argues that methodological pluralism is acceptable but what is not acceptable is philosophical pluralism. Qualitative approach and quantitative approaches are complimentary and where appropriate should be combined in such a way as to maximize their strengths and minimize their limitations (Orodho, 2005).

### **3.2 Research Design**

Research design is a blue print, framework or plan for a study that guides the collection and analysis of data derived from both primary and secondary sources. Research designs can be classified in to explanatory, descriptive or causal but their distinctions are not absolute (Churchill & Iacobucci, 2005). The study adopted a combination of descriptive and exploratory research designs. The exploratory research design was informed by the fact that research on HRIS in the context of Africa and Kenyan public sector is very marginal. The exploratory research design is an approach that is primarily concerned with discovery and generating or building a theory. Kothari (2007) explains that exploratory studies aim at formulating a problem for more precise investigation of developing the working hypothesis from operational point of view. He further adds a research design appropriate for such

studies must be flexible enough to provide opportunity for considering different aspects of a problem under study. The major emphasis is on discovery of ideas and insights. The choice of this design was appropriate for this study in breaking new ground since it would yield new insights into the topic for research; to discover why there was low usage of HRIS in the Teachers Service Commission of Kenya in the midst of scanty literature on the same.

Descriptive research is guided by hypothesis and focuses on frequency with which something occurs or the relationship between two variables as was the case in the study; where it sought to find out the effect of the independent variables on the dependent variable with and without a moderator. The data collected was descriptive; it could not necessarily be reduced to symbols and numbers. The goal of descriptive study is to offer the researcher a profile or to describe relevant aspects of the phenomena of interest from an individual, organizational, industry-oriented, or other perspective (Sekeran, 2003). In addition, the data collected was used to prove or disapprove hypotheses held before the study. However, qualitative approach and quantitative approaches are complimentary and were combined in such a way as to maximize their strengths and minimize their limitations (Orodho, 2005). Therefore, quantitative approach was also used especially in generalizing findings across the population under study, since some of the questions solicited numerical answers. The two approaches were successfully used a study on “Factors affecting Retention of knowledge workers (Sutherland, 2004)”.

### **3.3 Target Population**

Target population is also referred to as the universe. Target population includes all the members real or hypothetical set of people, events or objects to which researchers wish to generalize the results of their research (Singleton & Strait, 2010). The target population of the study was the secretariat staff of the TSC in Kenya; the headquarters, and regional offices spread across the country, which was 3000 in number. It included all top level and middle level management staff. For the purpose of this study the top management comprised of directors heading the seven directorates namely: teacher management, human resource management, finance, audit, accounts, administration and ICT, TSC county directors in the field offices, and senior deputy directors in charge of divisions. The middle level management included all deputy directors and assistant deputy directors. This target population was also most likely to be well informed about human resource information systems (see Table 3.1)

**Table 3.1 Target Population**

Directorate	Top mgt	Middle mgt	Total
Teacher mgt	6	53	59
HR Mgt	6	25	31
Administration	12	24	36
ICT	2	10	12
Accounts	3	10	13
Audit	2	10	12
Finance	3	5	8
Regional offices	7	25	32
<b>TOTAL</b>	<b>41</b>	<b>162</b>	<b>204</b>

### **3.4 Sampling Design.**

Bareker *et al.*, (2002) reckon that a sampling refers to the process of obtaining the participants for the study. It involves specifying the target population, choosing the sampling procedure, and determining the sample size. A sample design is a definite plan determined before any datum is actually collected for obtaining a sample from a given population (Orodho, 2005).

#### **3.4.1 Sampling Method and Justification.**

Secretariat staff at the TSC offices across the country and the headquarters formed the scope of the study. Stratified sampling was then used to select the different sub groups that existed within the population. Cooper and Schindler (2008), state that stratified sampling method as a technique is used where the population is not homogeneous. This ensured that all strata were reproduced in the sample. Sekaran (2003) agrees with the above. He posits that while sampling helps to estimate

population parameters, there may be identifiable sub groups of elements within the population that may be expected to have different parameters in a variable of interest to the researcher. In this study the eight strata were: directorates of teacher management, human resource, ICT, accounts, internal audit, finance, administration and TSC county offices in the former provincial headquarters. This increased the accuracy of the study, other than grouping all together (Nachmias & Nachmias, 2003). Purposive sampling was then employed to select the respondents who comprised of all top management and middle level management officers at the TSC headquarters and county offices totaling 204.

### **3.4.2 Sample Size**

Gall *et al.*, (1999) reckon that researchers attempt to discover something about large group of individuals by studying a smaller group. The larger group that they wish to learn about is called a population while the smaller group is the sample. Wisker (2001) defines a sample as a selected and chosen group upon which you carry out your research. A sample is a subset of the population. It comprises of some members selected from it. By studying the sample, the researcher should be able to draw conclusions that would be generalized to the population of interest (Sekaran, 2003). He further explains that sampling is the process of selecting a sufficient number of elements from the population, so that a study of the sample and an understanding of its properties or characteristics would make it possible for us to generalize such properties or characteristics to the population elements.

A sample size 204 respondents was used in the study. Out of these, 42 were drawn from top management and 162 from middle level management. All made the

population of study since they comprised the group that is faced with decision making at the commission.

This was arrived at by using the formula below as espoused by Mugenda & Mugenda (2003).

$$n = z^2 pq / d^2 = (1.96)^2 (0.5) (0.5) / (0.01)^2 = 384.$$

However this is only applicable when the population size is at least 10,000. When the population is less than 10,000 as was the case with this study, then the sample size was subjected to the formula:  $n_f = n / 1 + (n-1)/N$

$$= 384 / 1 + 383 / 417 = 384 / 1.91846$$

$$= 200$$

$$\text{Which } 200 / 203 \times 100 = 99$$

Therefore the sample for top management was  $99\% \times 40 = 3$ .

$$\text{Middle management was } 100\% \times 160 = 158$$

Where:  $n$  = the desired sample size

$z$  = the standard normal deviate at the required confidence level

$p$  = the proportion in the target population estimated to have characteristics of adoption being measured assumed to be  $50\% = 0.5$

$$q = 1 - p = 0.5$$

$d$  = the level of statistical significance set. (0.05).

The number of staff and sample size for each stratum is shown in Table 3.2

**Table 3.2 Sample Size**

	<b>Top mgt</b>	<b>Middle mgt</b>	<b>Sample Total</b>
<b>Teacher mgt</b>	6	52	58
<b>HR mgt</b>	6	25	37
<b>Administration</b>	12	24	42
<b>ICT</b>	2	10	22
<b>Accounts</b>	3	10	13
<b>Audit</b>	2	10	12
<b>Finance</b>	3	6	9
<b>Regional offices</b>	7	25	21
<b>Total</b>	41	180	204

### **3.5 Data Collection Techniques**

The study used both primary and secondary data. Since different data collection methods have different strengths and weaknesses complimentary tools and methods were used. The selection of the tools and methods was guided by the research method, nature of data to be collected, and the research objectives. The research instruments used in the study was a questionnaire.

#### **3.5.1 Questionnaire**

Questionnaire has been defined as a document that asks the same questions of all individuals in the same sample. The researcher chose the questionnaire because it is relatively economical, easier and quicker to administer than interviews or focus group discussions for a large group of respondents. (Kathuri, 1993), (Orodho, 2004) and (Mugenda & Mugenda, 2003). The questionnaire also enables qualitative and quantitative analysis of data. The questionnaire employed both structured and unstructured questions and was self-administered. It also adopted open ended and close ended questions. Likert Scale of (1-5) was used. Saunders *et al.*, (2007)

observe that personal contact with the respondents raises response rate by 19% and anonymity by 20%. Consequently, with the help of a research assistant the researcher distributed the questionnaire to the respondents and collected them thereafter on an agreed date. The respondents were not required to indicate their names on the questionnaire.

### **3.6 Reliability of Instruments.**

Reliability indicates consistency, or the extent to which a measure does not contain random error. *Sunders et al.*, (2007) explains that the extent to which data collection techniques or analysis procedures will yield consistent findings it can be assessed by posing the following three questions.

- i. Will the measure yield similar observations on other occasions?
- ii. Will similar observations be observed by other observers?
- iii. Is there transparency on how sense was made from the raw data?

Similarly, *Sekaran* (2003) observes that reliability is established by testing for both consistency and stability. Consistency indicates how well the items measuring a concept hang together in a set.

All the above underscore the importance of reliability of the data as part of the study and should be addressed early in the research process and also reported in the final document. *Borg & Gall* (1983) assert that reliability is an extremely important characteristic of tests, and it must be considered carefully in selecting measures for research purposes. They further add, the level of reliability a research worker should expect from a test is determined largely by the nature of research in which he plans to use the measure. To test the reliability of the instruments a test- retest method was

used. Test re-test estimates of reliability were obtained by correlating data collected with those from the same questionnaire collected under as near equivalent conditions as possible (Saunders *et al.*, 2003).The questionnaire was therefore administered twice to respondents. The instruments were also piloted using a small representative sample identical to, but not including the group going to be surveyed (Orodho, 2003).The results obtained, were coded and entered into a computer program after which a reliability index was calculated using the Cronchbach's alpha.

$$KR_{20} = \frac{(K)(S^2 - \sum S^2)}{(S^2)(K - 1)}$$

Where  $KR_{20}$  is reliability coefficient of internal consistency

K number of items used to measure the concept

$S^2$  Variance of all scores

$s^2$  variance of individual items

A cronchbach alpha coefficient of 0.7 and above was considered high enough to judge the instrument as reliable. A high cronchbach alpha coefficient implied that the items correlated highly among themselves i.e. there was consistency among the items in measuring the concept of interest (Mugenda & Mugenda, 2003).

### **3.7 Validity of Instruments**

Robinson (2003) argues that validity means what is measured is the same as what was purported to be measured.

In other words validity is the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. Content validity is non-statistical method used to validate content employed in the instrument (questionnaires).

Sekaran (2003) describes two types of validities: internal validity and external validity. Internal validity he says refers to the confidence we place in cause- and-effect relationships. 'To what extent does the research design permits us to say that the independent variable A causes a change in the variable B? External validity he goes on to say refers to the extent of generalizability of the results of a causal study to other settings, people, and events. In this study the following measures were taken to ensure the items in the questionnaire produced valid data.

Expert opinion: The comments of supervisors were incorporated in the instruments as a way of improving their validity.

A pilot study: a pre test study was carried out in Nairobi county TSC offices after which the results of the pilot data analysis were used to improve validity of the instruments.

Factor analysis: Validity test was also done on the research instrument using a method of Principal Component Analysis (PCA) to extract the factors. The criteria, as suggested by Hair *et al.*, (2010), was that factor loadings greater than 0.40 were considered statistically significant for studies with sample size less 200. Consequently in this study, 0.40 was used as the cut- off for loadings since the sample size of the study was 140. The higher the factor loadings were, the greater they were related to the variable.

### **3.8 Data Processing, Analysis and Presentation.**

Sekaran (2003) describes three objectives of data analysis. The first is getting a feel for the data, testing the goodness of data, and testing the hypotheses developed for the research. Sample adequacy was tested using the Kaiser- Meyer- Olkins (KMO) test. The sample was considered acceptable since the KMO values were mainly between 0.707 and 0.810. The least value was 0.644 which was also good enough since it was above the minimum of 0.5. A factor analysis is inappropriate when the sample size is below 50 (Field, 2005). In this study the sample size was 204 with a response rate of 140.

Factor analysis was conducted to ascertain the suitability of all the factors observed within the five variables. First, correlation matrix was obtained for all the factors and scrutinized for chances of Multicollinearity. Multicollinearity is said to occur when two or more variables under investigation in the regression model are highly correlated hence making it difficult to isolate their individual effects on the dependent variable. Consequently items that did not meet the criterion of a minimum factor loading of 0.4 were discarded (Fiedel, 2005).

The data obtained in the study was both qualitative and quantitative. For items in the questionnaire that were quantitative, numbers were assigned to responses. Qualitative data was converted to quantifiable forms by coding using SPSS text editor (Mugenda & Mugenda, 2003). All data was then analyzed and presented in the form of tables, percentages, graphs and frequency tables. The results were analyzed using both descriptive and inferential statistics. Multiple regression analysis model was used in data analysis. This was because the study was dealing with multiple independent

variables i.e. management participation, infrastructure and internal structure of an organization. The dependent variable is usage of HRIS with a moderating variable; effect of external environment.

The model was as follows:  $y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + e$

$B_0$  = constant

$B_i$  = coefficient of independent variable.

$i = 1, \dots, 4$

$X_i$  = independent variables

$i = 1, \dots, 3$

$e$  = error

The hypotheses were tested using a two tailed t- test whereby the null hypothesis was rejected if the p value was greater than the level of significance which was fixed at 5%.

The test was to reveal whether there existed any relationship between the independent variables: management participation, infrastructure and internal structure of the organization. The null and alternative hypotheses were formulated as follows:

- i.  $H_{01}: \beta_1 = 0$  vs  $H_{11}: \beta_1 \neq 0$
- ii.  $H_{02}: \beta_2 = 0$  vs  $H_{12}: \beta_2 \neq 0$
- iii.  $H_{03}: \beta_3 = 0$  vs  $H_{13}: \beta_3 \neq 0$

Analysis of variance (ANOVA) was also used to investigate whether  $X_1$ ,  $X_2$  and  $X_3$  (dependent variables) have combined effect on  $Y$  (dependent variable).

$H_0: \beta_1 = \beta_2 = \beta_3 = 0$  vs  $H_1$ : at least one  $\beta_i$ ,  $j=1,2,3$ , is not equal to zero.

As espoused by Mugenda and Mugenda (2003) correlation technique is used to analyze the degree of relationship between two variables.

The models with a moderating variable were as follows:

Management participation ( $X_1$ ) and external environment ( $X_4$ )

$$Y_1 = \beta_{01} + \beta_{11}X_1 + \beta_{21}X_1X_4 + e$$

Infrastructure ( $X_2$ ) and external environment ( $X_4$ )

$$Y_2 = \beta_{02} + \beta_{12}X_2 + \beta_{22}X_2X_4 + e$$

Internal structure ( $X_3$ ) and external environment ( $X_4$ )

$$Y_3 = \beta_{03} + \beta_{13}X_3 + \beta_{23}X_3X_4 + e$$

The computation of a correlating coefficient yields a statistic that ranges from -1 to +1. This statistic is called a coefficient ( $r$ ) which indicates the relationship between two variables. The bigger the correlation the stronger the relationship, between the two variables under comparison. The direction of the relationship is also important in that if it is positive (+) it means that there is a positive relationship between the two Variables and this means that when one variable increases the other increases and when one decreases the other also decreases. A negative (-) relationship means that when one variable decreases the other increases and vice versa therefore an inverse relationship. If there is no relationship the coefficient is equal to zero. Pearson's

product moment correlation coefficient is used to determine the strength and direction of the relationship between the dependent variable and independent variables. This was carried out for the three variables: management participation, infrastructure and internal structure of an organization. The hypotheses were as follows.

$$H_0: r = 0$$

$$V_s$$

$$H_1: r \neq 0$$

## **CHAPTER FOUR**

### **DATA ANALYSIS, RESEARCH FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

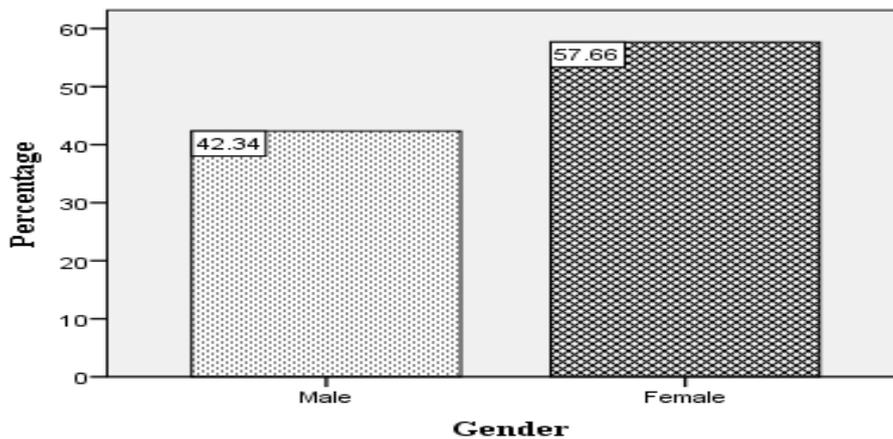
The focus of the study was to investigate determinants of usage of HRIS in the operations of TSC in Kenya. Towards that end data analysis was carried out using descriptive analysis, formulation of regression model and interpretation of the results. This chapter presents data analysis, findings and discussions and chapter summary.

#### **4.2. Response rate**

A survey was conducted during March- July 2014 covering TSC offices country wide. A structured questionnaire was administered to employees of sampled TSC offices totaling to 206 respondents. The response rate was 140 employees which is 67.96%. This response rate is acceptable according to Mugenda and Mugenda (2008). He proposes that a response rate of 50% is considered adequate, 60% is good and rates above 70% are very good. Babbie (2002) also agrees that a response rate of 50% is acceptable. Therefore a response rate of 67.96% was adequate for the study. The survey targeted the top and middle level employees of TSC since they are involved in decision making, and implement and supervise implementation of TSC policies.

### Response by gender

The results of the study showed that out of the 140 respondents, 137 responded positively while three did not indicate their gender. The male respondents were 58 (42.3%) while 79 (57.7%) were female from the sampled TSC offices countrywide as provided in Figure 4.1. however the respondents gender did not affect the answers they gave.



**Figure 4.1 Response by gender**

### Response by age

The responses indicated that most of the employees who were drawn from middle and top management level were in the age bracket of 40- 50 years at 59.3% and 25.7% for the age bracket 30- 40 years. These age brackets mainly comprise the operation managers and implementers of policies at the TSC. The organizational structure narrows towards the top comprising of employees in job group ‘Q’ and above. Most of the top management are the top decision makers who commit an organizations resources which is paramount in maintenance of HRIS infrastructure.

They are also thoroughly informed about the operations of TSC most of them having risen to their current positions over the years. Therefore their responses were crucial to this study.

The least were in the age bracket of 30 years and below at 5.0%. These are employees who are yet to rise to management level, followed by above 50 years at only 7.1% (See Table 4.1).

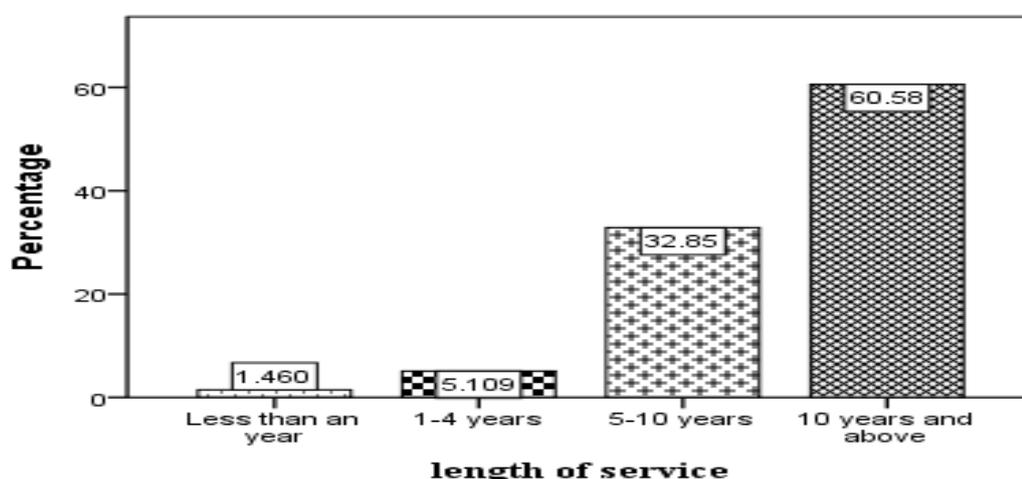
**Table 4.1 Age of respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
Below 30 years	8	5.7	5.7	5.7
30-40 years	39	27.9	27.9	33.6
40-50 years	83	59.3	59.3	92.9
50 and above	10	7.1	7.1	100.0
Total	140	100.0	100.0	

**Response by length of service**

Most of the respondents had worked at the TSC for over ten years that is 83 (60.6%). This is understandable since the schemes of service to a large extent control how long it takes to move to the management levels at job group ‘M ‘and above. This was followed by 5-10 years who were 45 (32.8%). Only two, 1.5 % respondents had worked with the organization for less than a year. Three respondents did not indicate how long they had served at the TSC. The findings are as shown in Figure 4.2. The respondents were required to indicate the period they had served at the TSC with the aim of testing work experience and appropriateness of answering the questions on Determinants of HRIS usage in the TSC operations in Kenya. The longer the period

they had served the more likely it was to obtain reliable information on HRIS and operations of Teachers Service Commission.



**Figure 4.2: Length of service at TSC**

**Response according to directorates**

There was a hundred percent response to the question. The majority of the respondents were in the teacher management directorate 46 which is 32.9 %. This is because the directorate has more departments represented throughout TSC offices in the country unlike some which have their operations only at the head quarters. The administration and human resource directorates followed with 20.7% and 19.3% respectively. These are the three directorates that carry out the core functions of the TSC mainly recruit, register, promote, and deploy teachers and were therefore most acquainted with the operations of TSC. They were also the consumers of HRIS at the commission. The other directorates mainly supplement the core functions carried out by the three directorates. The audit, finance and accounts had the least numbers in response 2.1%, 2.9% and 3.6% respectively. They also had the least target populations of 12, 8 and 13 in similar order. Despite the ICT directorate being fundamental in implementation of HRIS it had a low representation of only 6.4%

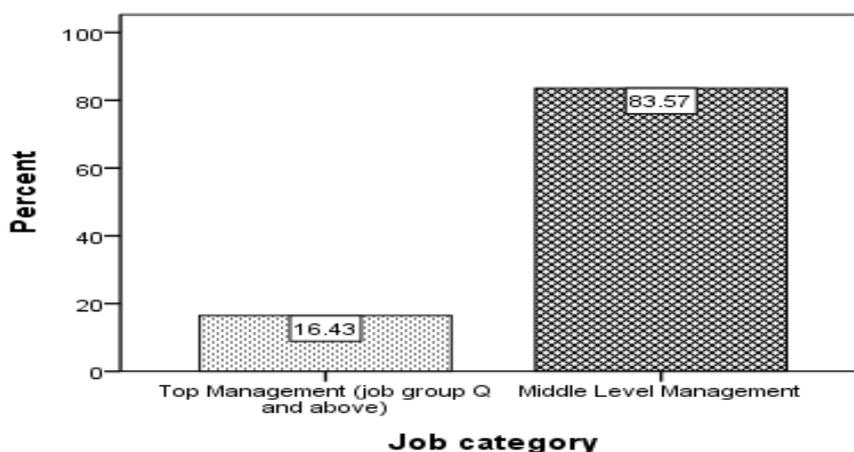
(see Table4.2) the responses from all the directorates was paramount since this would make the study representative of the whole commission.

**Table 4.2 Representation of Directorates**

	<b>Frequency</b>	<b>Valid percentage</b>
Finance	4	2.9
ICT	9	6.4
HRM	27	19.3
Administration	29	20.7
Audit	3	2.1
Accounts	5	3.6
Teacher Management	46	32.9
Teacher Management	17	12.2
<b>Total</b>	<b>140</b>	<b>100</b>

**Response according to job categories**

Most of the respondents at 80% were in the middle level management while 20% were in top management. This is understandable in that the top management mainly comprises of the heads of directorates who are few in number. The results are shown in Figure 4.3.



**Figure 4.3 Job category**

### **4.3. Pilot study results.**

A pilot study was conducted to establish whether the research instrument was valid and reliable for data collection. The testing was done using a sample of 35 questionnaires where reliability, validity and factor analysis was performed and findings are discussed.

#### **4.3.1 Reliability and Validity of Research Instrument.**

Reliability of a measure indicates the extent to which it is without bias (error free) thus ensuring consistent measurement across time and the various items in the instrument. Reliability of the instrument was carried out using Cronbach's alpha constant which is a measure of internal consistency and average correlation. It ranges between 0 and 1 (Kipkebut, 2010). As a rule of thumb acceptable alpha should be at least 0.70, (Mugenda & Mugenda, 2003). Higher alpha coefficient values mean there is consistency among items in measuring the concept of interest. Cronbach constant test was carried out for every variable.

The variable management participation had eleven factors. Reliability test was carried out on the instrument and Cronbach constant was 0.572 which is far much below 0.7. After removing factor three the reliability increased to 0.710 which was above the threshold. Items on variable infrastructure did not require any adjustment since the alpha constant was 0.808. For internal structure of the organization alpha constant was 0.685. However, after removing factor one the reliability increased to 0.724. External environment had an alpha constant of 0.697 which rose to 0.815 after removing factor nine. Lastly the dependent variable had alpha constant 0.774 so no factor was removed. Table 4.4 shows the summary of the finding based on the

reliability of the research instrument and the overall Cronbach's constant was 0.766 hence the instrument was reliable.

**Table 4.3: Reliability of instruments**

Variables	Cronbach's Alpha before removing some items	Cronbach's Alpha after removing Some items	No of Items before removing some factors	No of Items after removing some factors
Management participation	0.572	.710	11	10
Infrastructure	0.808	.808	11	11
Internal structure of the organization	0.685	.724	9	8
Effect of External environment	0.607	0.815	9	9
Adoption of HRIS	0.774	0.774	12	12
<b>AVERAGE</b>	<b>0.678</b>	<b>0.766</b>		

Validity test was also done on the research instrument using Principal Component Analysis (PCA) to extract the factors. The findings are summarized in Table 4.4 (a, b, c, d and e). The criteria, as suggested by Hair *et al.*, (2010), was that factor loadings greater than 0.40 were considered statistically significant for studies with sample size less than 200. Consequently in this study, 0.40 was used as the cut-off for loadings since the sample size of the study was 140. The higher the factor loadings were, the greater they were related to the variable.

The variable management participation had 11 items as originally compiled. However one item with loadings less than 0.40 was discarded (see Table 4.4a). Therefore 10 factors for management participation with factor loadings between 0.474 and 0.673 were considered valid for the constructs represented.

**Table 4.4 (a) Factor loadings for management participation**

	<b>Management participation</b>	<b>Factor</b>	<b>Loadings</b>
1	HRIS assists managers to make timely decisions		.673
2	There is management of HRIS soft ware in the post implementation stage.		.668
3	HRIS is more of a clerical than top management issue		.629
4	Top management at the TSC is actively involved in implementation of HRIS.		.606
5	Top management is trained on the use of HRIS		.598
6	Top management assigns enough funds to support HRIS infrastructure.		.590
7	The TSC has official policies and procedures for managing email records.		.574
8	The head of HRIS sits at the top management meetings		.563
9	HRIS should be confined to ICT department		.545
10	Information specialists at the commission are well acquainted with the needs of management to produce relevant report		.474
11	Top management believes HRIS Would increase efficiency and effectiveness in management of HR		.399**

The study intended to measure the effect of infrastructure by using 11 items. All the 11 had factor loadings above 0.40 that is between 0.599 and 0.771, Table 4.4(b). Therefore all were found to be valid for the constructs they represented and could therefore be used in the study. Moreover the cronbach alpha constant for the construct infrastructure was 0.808 (see table 4.3) which exceeded the reliability cut-off value of 0.70 and thus indicated a high internal consistency for the study.

**Table 4.4 (b) Factor loadings for infrastructure**

	<b>Infrastructure</b>	<b>Factor Loadings</b>
1	The TSC does not experience system failures that interfere with HRIS performance	.773
2	All staff in the TSC are aware of HRIS at the Commission	.771
3	The commission has network file servers and web servers	.742
4	The commission has a mainframe facility for the usage of HRIS	.736
5	The TSC has a trusted, statewide, centralized repository for email	.711
6	There is a system that integrates all employees' information with payroll and financial software.	.696
7	There is trained technical staff to support maintenance of HRIS at the TSC	.686
8	There is imaging/document management system	.653
9	IT facilities in the commission are enough	.640
10	Human resource and teacher management functions and processes are conducted electronically.	.606
11	There is adequate networked infrastructure at the TSC to serve ICT needs of the organization.	.599

In order to test the validity of internal structure of the organization, an instrument comprising eight items was considered as originally compiled from the literature. Subsequently one item, the ninth item, with low factor loadings of 0.376 was discarded leaving seven items with factor loadings between 0.500 and 0.860 as shown in Table 4.4(c). These were considered valid to measure effect of internal structure of the organization on usage of human resource information systems on the operations of Teachers Service Commission in Kenya.

**Table 4.4 (c) Factor loadings for internal structure of the organization**

<b>Internal structure of the organization</b>		<b>Factor Loadings</b>
1	Staff choose their own representatives in the welfare	.860
2	There is a functional staff welfare at the TSC	.766
3	The TSC responds to changes in its environment effectively	.673
4	Creativity is emphasized and encouraged at TSC	.667
5	TSC strictly operates routinely through formalized structures and processes	.564
6	There is inter departmental networking at TSC	.551
7	TSC is more devoted to improving efficiency of existing operations than exploring new ideas	.501
8	Directors of various departments hold regular meeting	.500
9	Decision making is centralized at the TSC	.376**

From the original list of nine items put forward to measure the moderating effect of external environment the PCA method discarded one item, which solicited responses on the type of decision making that was employed at the Teachers Service Commission. It had factor loadings of 0.117. This was considered statistically unviable since it was way below the threshold of 0.40. Consequently it was expedient to discard it leaving eight items with factor loadings of between 0.457 and 0.680 as shown in Table 4.4 (d).

**Table 4.4 (d) Factor loadings for external environment**

	<b>External environment</b>	<b>Factor Loadings</b>
1	Global trends have an influence on usage of HRIS in TSC's operations.	.680
2	The TSC bench marks usage of HRIS with other institutions within and outside the country.	.674
3	The government has installed infrastructure for usage of HRIS at TSC	.653
4	Adoption of HRIS will enhance service delivery at the TSC	.631
5	The relationship of the TSC and its customers and other organizations has led to the demand for HRIS.	.616
6	HRM and IT staff get to attend national or regional conferences on HRIS	.612
7	Information technology staff has been sensitized about the maintenance of HRIS infrastructure.	.578
8	Government support is key to adoption of HRIS in TSC	.457
9	Usage of HRIS in its operations gives the TSC a better image in the global market	.117**

To measure usage of human resource information system at the Teachers Service Commission's operations in Kenya, 12 items were presented as compiled from literature. All the 12 were found to have acceptable factor loadings of between 0.539 and 0.758 and subsequently considered valid for inclusion in the data collection instrument and further analysis (See Table 4 e). Moreover the observations on Table 4.3 showed the Cronchba alpha for the dependent variable usage of human resource system in the operations of Teachers Service Commission in Kenya was statistically acceptable at 0.774. This was above the acceptable threshold of 0.700.

**Table 4.4 (e) Factor loadings for usage of HRIS**

<b>Adoption of HRIS</b>	<b>Factor Loadings</b>
1. There is a system that holds staff grade, pay benefits and job description	.758
2. There is a computerized system that holds employee career history, skills and qualifications.	.745
3. TSC advertises posts and receives applications on-line	.711
4. The TSC has an updated website accessible to staff and clients.	.709
5. ICT services have reduced the number of written correspondences by teachers to the TSC offices.	.682
6. Employees' data on leaves records and absenteeism are monitored electronically and reports generated.	.634
7. There are enough computers for use by all staff in carrying out the operations of the TSC.	.627
8. Managers have access to electronic staff records.	.624
9. HRIS is used in preparing the payroll for staff.	.606
10 Since the adoption of ICT services the no of teachers visiting the TSC has reduced	.603
11 TSC managers and employees have direct access to HR and other work place services through intranet.	.586
12 Changes in personnel policies and procedures are communicated to employees on- line	.539

#### **4.4 Descriptive Analysis.**

##### **4.4.1 Involvement of Top Management in usage of HRIS**

From the results, most respondents, 62% agreed that the top management at TSC was involved in implementation of HRIS which also includes having official policies and procedures for managing email records. Most respondents, 84.1% were positive that HRIS helped managers to make timely decisions. However 80.9% disagreed that HRIS should be confined to ICT department. The middle level and to managers from the field offices particularly Garissa in North Eastern Kenya and Kwale county observed that HRIS should be expanded to interact with operations in the field offices thus enhancing decision making.

On average the respondents were of the opinion that top management played a major role in adoption of HRIS at TSC. Deryl (2006) collaborates this opinion. He asserts that to obtain organizational buy-in regarding the strategic contribution of HRIS has been in some cases hindered by skepticism and lack of management support (See Table 4.5).

**Table 4.5: Management Participation**

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>
Top Management at the TSC is actively involved in implementation of HRIS	10.7	22.9	9.3	43.6	13.6	3
The TSC has official policies and procedures for managing email records	8.6	25.0	10.0	46.4	10.0	3
HRIS is more of a clerical than top management issue	26.4	27.1	8.6	20.7	17.1	3
HRIS should be confined to ICT department	47.1	33.8	8.8	2.9	7.4	3
Top Management assigns enough funds to support HRIS infrastructure	15.0	37.1	32.9	11.4	3.6	3
HRIS assist managers to make timely decisions	2.9	7.2	5.8	56.8	27.3	3
There is management of HRIS software in the post implementation stage	9.4	20.1	23.7	38.1	8.6	3
Top management is trained on the use of HRIS	14.5	31.9%	21.0	23.2	9.4	3
The head of HRIS sits at the top management meetings	5.0%	12.2%	14.4	37.4	30.9	4
Information specialists at the commission are well acquainted with the needs of management to produce relevant reports	9.45 %	26.6 %	10.1 %	41.7 %	12.2 %	3

#### **4.4.2 Infrastructure**

Most of the respondents, 79.3%, were of the opinion that IT facilities at the TSC were not enough while 50.7% indicated that they did not agree there was adequate networked facilities to serve the ICT needs of the organization. Computers were not adequate to serve all officers in most directorates especially the quality assurance section under teacher management that deals with registration of teachers as well as staffing section. A significant number, 78.9% indicated there is a system that integrates all employees' information with payroll and financial software. This statement is true of all public organizations where integrated personal payroll data (IPPD) is used. System failure was a major setback at the TSC as was indicated by 80% of respondents.

The county offices had minimal infrastructure such as a computer that was mainly used by the secretary and one other for the county director. For instance in Nyeri, Nakuru, Kericho and Machakos had only one or two computers that were mainly used for data capture and typing. The human resource department was most affected by information system failure that led to backlog of HR issues that took long to resolve like unpaid arrears for teachers after promotion. This led to an increase of letters of complaints from affected teachers not to mention unnecessary visits to both the county offices and the headquarters. Vries (2006) observed that scarcity or unavailability of equipment and financial resources for maintaining HRIS are a barrier to sustainability of HRIS (see Table 4.6)

**Table 4.6: Infrastructure**

<b>Statements</b>	<b>S D</b>	<b>D</b>	<b>U</b>	<b>A</b>	<b>S A</b>	<b>Mean</b>
IT facilities in the commission are enough	48.6 %	30.7%	7.1%	11.4 %	2.1%	2
The commission has a mainframe facility for the usage of HRIS	5.0 %	26.4%	19.3%	44.3 %	5.0%	3
The commission has network file servers and web servers	6.4 %	13.6%	17.1%	48.6 %	14.3%	4
There is imaging/document management system	4.3 %	17.9%	15.7%	54.3 %	7.9%	3
The TSC has a trusted, statewide, centralized repository for email	8.6 %	17.9%	27.9%	40.7 %	5.0%	3
There is adequate networked infrastructure at the TSC to serve ICT needs of the organization	16.4 %	34.3%	12.9%	26.4 %	10.0%	3
There is a system that integrates all employees' information with payroll and financial software	2.9 %	9.3%	9.3%	50.7 %	27.9%	4
Human resource and teacher management functions and processes are conducted electronically	20.0 %	32.9%	10.0%	27.1 %	10.0%	3
There is trained technical staff to support maintenance of HRIS at the TSC	8.6 %	19.3%	11.4%	45.7 %	15.0%	3
The TSC does not experience system failures that interfere with HRIS performance	57.1 %	22.9%	8.6%	8.6 %	2.9%	2

#### **4.4.3 Internal Structure of the Organization**

A significant number of respondents, (45%) disagreed with the statement that creativity was encouraged at TSC which is understandable since an equally significant number (64.7) was of the opinion that TSC was more committed to improving existing operations than exploring new ideas. The official information systems for relaying data to the headquarters often took long. Consequently most counties in collaboration with officers managing the regions at the headquarters had

devised an on-line system that assisted in collecting data and information directly from schools. Most respondents indicated that directors hold regular meetings (71.7%). This was however found not to be true of the county directors: Garissa, Nakuru, Kericho and Embu indicated since they only attended meetings with other directors during recruitment briefings and appointment boards which was not often. Further findings 61.8% indicated that TSC as an organization does not respond well to changes in its environment. The organization had not upgraded its servers to match with the requirements of an efficient HRIS. A majority 87.1% agreed that there was a functional welfare and they also chose their own leaders. However Nyeri and Nakuru indicated that they felt left out during the elections of the leaders. The headquarter staff had a bigger stake in the elections that were often conducted in Nairobi. Results are displayed in Table 4.7.

**Table 4.7: Internal Structure of the Organization**

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>	<b>Mean</b>	
Creativity is emphasized and encouraged at TSC	32.1%	12.9	14.3%	%	10.0%	30.7%	2
TSC strictly operates routinely through formalized structures and processes	8.6%	12.1 %	48.6%	20.7%	10.0%	4	
The TSC responds to changes in its environment effectively	48.6%	9.3 %	24.3%	5.0%	12.9%	3	
TSC is more devoted to improving efficiency of existing operations than exploring new ideas	11.4%	14.3 %	46.4%	18.6%	9.3%	4	
There is inter departmental networking at TSC	31.4%	6.4 %	34.3%	10.7%	17.1%	3	
Directors of various departments hold regular meeting	13.6%	7.9 %	52.1%	20.0%	6.4%	4	
There is a functional staff welfare at the TSC	4.3%	7.9 %	47.9%	33.6%	6.4%	4	
Staff choose their own representatives in the welfare	4.3%	2.9 %	41.4%	45.7	5.7%	4	

**4.4.4: Effect of External Environment**

Majority of respondents 76.4% were of the opinion that government support was key to implementation of HRIS. The TSC relied on the government for funding since it does not generate any funds. The government encouraged digitalizing of files. However the TSC lacked adequate equipment. This opinion is supported by Miles and Snow (2003). They state, that every organization is embedded in a network of external influences and relationships which can be labeled as its environment. The environment is not a homogeneous entity but rather is composed of complex combination of factors such as product and labour market conditions, industry

customs and practices, government regulations, and relations with financial and raw material suppliers. A significant portion, 80.7% were positive that adoption of HRIS would enhance service delivery. The county offices of Embu, Kwale and Garissa indicated that they would travel less if there was an effective HRIS that would link their offices with the headquarters. Often their opinions on HR issues took long to reach the commission. Discipline issues that required to be addressed within a month took longer since most communication required the officers to travel to Nairobi.

Lawler *et al.*, (2004) is of the same opinion that HRIS provide HR professionals with the opportunities to enhance their contribution to the strategic direction of the firm. From the study, 77.1% indicated that the relationship of the TSC and its clients as well as other organizations led to demand of HRIS while 77.8% were of the opinion that global trends had an influence on adoption of HRIS at the TSC. Organizations that TCS had bench marked with were using HRIS (See Table 4.8).

**Table 4.8: Effect of External Environment**

<b>Statement</b>	<b>SD</b>	<b>D</b>	<b>U</b>	<b>A</b>	<b>S A</b>	<b>Mean</b>
Government support is key to adoption of HRIS in TSC	7.1%	7.9 %	8.6%	34.3 %	42.1 %	4
Adoption of HRIS will enhance service delivery at the TSC	2.1%	2.9 %	4.3%	31.4 %	59.3 %	4
The government has installed infrastructure for adoption of HRIS at TSC	6.4%	18.6 %	25.7%	40.7 %	8.6 %	3
HRM and IT staff get to attend national or regional conferences on HRIS	21.4%	28.6 %	22.9%	20.0 %	7.1 %	3
Information technology staff has been sensitized about the maintenance of HRIS infrastructure	5.7%	12.1 %	26.4%	47.9%	7.9%	3
The relationship of the TSC and its customers and other organizations has led to the demand for HRIS	2.9%	11.4 %	8.6%	50.0 %	27.1 %	4
Global trends have an influence on adoption of HRIS the TSC's operations	5.0%	7.9 %	9.3%	45.7 %	32.1 %	4
The TSC benchmark adoption of HRIS with other institutions within and outside the country	8.6%	21.4 %	16.4%	37.1 %	16.4 %	3

#### **4.4.5: Usage of HRIS**

Most of the respondents (86.2%) agreed that TSC advertises posts and receives application on-line. This was in terms of applications for promotions to job groups M, N, P, Q and R. vacancies for recruitment of teachers was also advertised on-line. This reduced greatly enquiries by applicants to the county offices since instructions would be posted on the TSC website. However only, 35.0% indicated that employees have direct access to HR and other work place services. A minority of respondents 19.8% were of the opinion that changes in personnel policies were communicated on- line. Circulars and internal memos were still being distributed in

hard copies. These took long to reach counties and schools. A significant percentage indicated that where the usage of ICT was applied in HR issues the no of teachers visiting the TSC had reduced. ICT services had reduced the number of written correspondences by teachers to the TSC offices, 49.2 and 51.5 % respectively. This was especially in checking the status of applications for transfers and promotions since the lists would be posted on the website. (See Table 4.9)

**Table 4.9: Usage of HRIS**

Statement	SD	D	N	A	SA
TSC managers and employees have direct access to HR and other work place services through intranet	19.0%	38.0%	8.0%	25.5%	9.5%
TSC advertises posts and receives application online	3.6%	4.4%	5.8%	52.6%	33.6%
The TSC has an updated website accessible to staff and clients	4.4%	5.9%	5.9%	52.9%	28.7%
HRIS is used in preparing the payroll for staff	4.4%	3.7%	6.7%	42.2%	43.0%
There is a computerized system that holds employee career history, skills and qualifications	5.1%	28.7%	18.4%	33.8%	14.0%
There is a system that holds staff grade, pay benefits and job description	5.1%	21.3%	12.5%	34.6%	26.5%
Changes in personnel policies and procedures are communicated to employees online	33.1%	33.1%	14.0%	14.7%	5.1%
Managers have access to electronic staff records	24.6%	39.6%	14.2%	15.7%	6.0%
Employees Data on leaves records and absenteeism are monitored electronically and reports generated	22.8%	32.4%	8.8%	25.7%	10.3%
There are enough computers for use by all staff in carrying out the operations of the TSC	52.9%	33.8%	5.9%	3.7%	3.7%
Since the adoption of ICT services the no of teachers visiting the TSC has reduced	14.0%	16.9%	19.9%	36.0%	13.2%
ICT services have reduced the number of written correspondences by teachers to the TSC offices	16.7%	20.3%	11.6%	42.8%	8.7%

## **4.5 Requisite Tests**

### **4.5.1 Multicollinearity Test**

Factor analysis was conducted to ascertain the suitability of all the factors observed within the five variables. First correlation matrix was obtained for all the factors and scrutinized for chances of Multicollinearity. Correlation matrix gives the correlation coefficients between a single factor and every other factor in the investigation. The correlation coefficient between a factor and itself is always 1; hence the principal diagonal of the correlation matrix contains 1s. This therefore means it is an identity matrix (Kothari, 2009). According to Tables of correlation Matrices in appendix III (a, b, c, d and e) there was no Multicollinearity amongst the observed factors for the variable under investigation and the matrices were also identity matrices. Further analysis using the determinants of the correlation matrices shown at the foot of each table indicates that the matrices obtained were all identity matrices since the determinants were all greater than 0.00001, so there was no problem of Multicollinearity for all the variables.

### **4.5.2 Identity Correlation Matrix Test (Bartlett's test of Sphericity)**

Bartlett's test indicates the strength of the relationship among variables. It tests the null hypothesis that the correlation matrices in appendix B were identity matrices. An identity matrix is one in which all of the diagonal elements are 1 and all off diagonal elements are 0 (Kothari 2009). From the same table, we can see that the Bartlett's test of Sphericity is significant since all the p-values were less than 0.05 as shown on Table 4.10. This means that correlation matrices in appendix B (a, b, c, d, and e)

were all identity matrices. The correlation matrices for all the variables have the diagonal elements as one and off diagonal have the significance of 0.

#### **4.5.3 Sample Adequacy Test (Kaiser-Meyer- Olkin (KMO))**

The sample adequacy was measured using the Kaiser-Meyer- Olkin (KMO) test. The sampling adequacy should be greater than 0.5 for a satisfactory factor analysis to proceed. A common rule is that a researcher should have 10 – 15 participants per variable. A factor analysis is inappropriate when the sample size is below 50 (Fiedel, 2005). Kaiser (1974) recommends 0.5 as minimum (barely accepted), values between 0.7- 0.8 acceptable, and values above 0.9 are superb. From Table 4.10, the sample was acceptable since the KMO values were mainly between 0.707 and 0.810. The least value was 0.644 which was also good enough since it was above the minimum of 0.5.

**Table 4.10: KMO and Bartlett's test**

Variables	Measure	
Management participation	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.707
	Approx. Chi-Square	300.162
	Bartlett's Test of Sphericity	df 45 Sig. .000
Infrastructure	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.764
	Approx. Chi-Square	426.463
	Bartlett's Test of Sphericity	df 55 Sig. .000
Internal structure of the organization	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.644
	Approx. Chi-Square	304.174
	Bartlett's Test of Sphericity	df 28 Sig. .000
Effect of external environment	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.810
	Approx. Chi-Square	350.593
	Bartlett's Test of Sphericity	df 28 Sig. .000
Usage of HRIS	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.736
	Approx. Chi-Square	442.465
	Bartlett's Test of Sphericity	df 66 Sig. .000

#### 4.5.4 Normality test

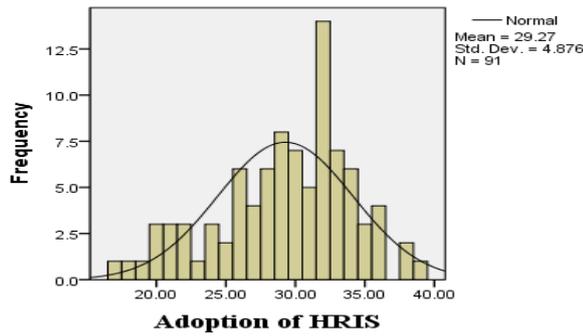
##### Skewness and Kurtosis test for normality

The study sought to find out how well the distribution could be approximated using the normal distribution. Consequently Skewness and Kurtosis was employed as shown in Table 4.11. Skewness measures the deviation of distribution from symmetry and Kurtosis measures 'peakness' of the distribution (Ming'ala, 2002). The values of Skewness and Kurtosis should be zero in normal distribution (Field, 2009).

**Table 4.11 Skewness and Kurtosis**

Variables	Descriptive	Statistic	Std. Error	Z score
Management participation	Std. Deviation	5.83031		
	Skewness	-.087	.231	-0.396
	Kurtosis	-.324	.459	-0.736
infrastructure	Std. Deviation	7.11785		
	Skewness	.176	.231	0.800
	Kurtosis	.385	.459	0.875
Internal structure of the organization	Std. Deviation	5.17376		
	Skewness	-.546	.231	-1.241
	Kurtosis	1.156	.459	1.627
Effect of external environment	Std. Deviation	5.57903		
	Skewness	-.875	.231	-1.978
	Kurtosis	1.163	.459	1.644
Usage of human resource information system	Std. Deviation	7.29604		
	Skewness	-.192	.231	-0.873
	Kurtosis	.486	.459	1.105

Although it is assumed in multiple linear regressions that the residuals are distributed normally it is a good idea before drawing final conclusions, to review the distributions of major variables of interest (Ming'ala, 2002). Histograms are a good way of getting an instant picture of the distribution of data (Field, 2009). Therefore a histogram was also employed in the study to test the normality of the dependent variable as shown in Figure 4.4 since t- test, regression and ANOVA are based on the assumption that the data were sampled from a Gaussian distribution (Indiana, 2011).



**Figure 4.4 Histograms for normality test**

**Kolmogorov- Smirnov and Shapiro Wilk test for Normality**

Kolmogorov- Smirnov and Shapiro Wilk test was also used to test the normality of all the variables. They compare the scores in the samples and check whether they have the same mean or standard deviation. The findings for Kolmogorov- Smirnov show that, the p- values were greater than 0.05 indicating that the distributions were normally distributed. It was the same case with Shapiro-Wilk. The details of the findings are shown in Table 4.12.

**Table 4.12 Kolmogorov-Smirnov and Shapiro-Wilk**

Variables	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Mgt participation	.075	91	.200*	.985	91	.377
Infrastructure	.088	91	.082	.982	91	.261
Internal structure of organization	.090	91	.064	.982	91	.234
Adoption of HRIS	.118	91	.051	.964	91	.051
Effect of external environment	.101	91	.056	.962	91	.062

\*. This is a lower bound of the true significance.

### Normality using Q-Q plot

The normal Q-Q plot for the dependent variable, adoption of HRIS, shown in Figure 4.5, indicates that the observed value was falling along a straight line. This therefore means the variable was normally distributed which was consistent with the earlier findings based on skewness and Kurtosis test, Kolmogorov- smirnov and Shapiro wilk test.

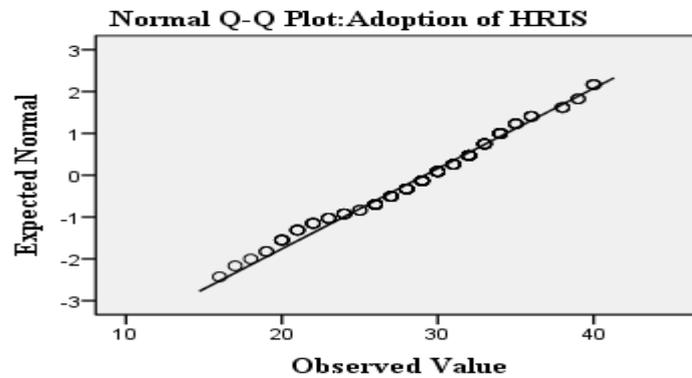


Figure 4.5 Q-Q plot

### 4.5.5 Outliers

An outlier may be described as any observation far from the rest of other observation. The presence of outlier in any given data may make the data not to assume Gaussian condition that is normality condition. It is therefore important to test the presence of outliers in any given data and even remove them for normality condition to be satisfied. In this study the outliers present are shown in Table 4.13.

**Table 4.13 Outliers Detected**

<b>Variables</b>	<b>Position of observed outliers</b>	<b>Total number of outliers</b>
Management participation infrastructure	- 20, 24, 94,31,65,78	0 6
Internal structure of organization	23, 28, 41, 91, 117,81,84,13	8
Usage of HRIS	24, 117	2
Effect of external environment	50, 66, 68, 70	4

#### **4.5.6 Collinearity diagnostic test**

When an eigen value is larger than the others then the uncentered cross products matrix can be highly affected by small changes in the independent variables or outcome. If the eigenvalues are fairly similar then the model obtained is likely to be unchanged by small changes in measured variables (Midi, 2010). According to the study findings both models had eigenvalues fairly larger than the rest indicating that the models obtained were likely to be changed by small changes in measured variable. The condition index is another way of expressing eigenvalues and they represent square root ratio of the largest eigenvalue to the eigenvalue of interest. The condition index will always be 1 for the dimension with the largest eigenvalue, however, the condition index value can be larger than 1. Large values may indicate that collinearity exists but it is also worth noting that there is no specific value or rule about how large the condition index value should be to indicate collinearity problems. According to the findings in Table 4.14 model 1 and model 2 had final condition index values 15.884 and 16.114 respectively. The values for dimensions in each model were fairly close to each other and therefore there was no collinearity.

Alternatively collinearity may be detected looking for Predictors that have high variance proportions on the same small eigenvalues. High variance proportions will indicate that the variances of their regression coefficients are dependent. In this study 57% of the variance in regression coefficient of management participation was associated with eigenvalue in dimension number 4, 52% of the variance in the regression coefficient of infrastructure was associated with eigenvalue in dimension 2 and 71% of the variance in the regression coefficient of internal structure of the organization was associated with eigenvalue in dimension 3 .This clearly indicated that there was no dependency between the three predictor variables for model 1.

In the presence of moderator collinearity exist since variance in the regression coefficient of infrastructure and internal structure of the organization were associated with eigenvalue in dimension 4 that 81% and 69% respectively.

#### 4.14 colinearity test

Model	Dimension	Eigen value	Condition Index	Variance Proportions			
				Constant	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>
Model1	1	3.940	1.000	.00	.00	.00	.00
	2	.024	12.858	.52	.04	.52	.05
	3	.021	13.800	.10	.39	.02	.71
	4	.016	15.884	.37	.57	.46	.24
Model 2	1	3.893	1.000	.01	.00	.00	.00
	2	.074	7.267	.84	.02	.06	.01
	3	.018	14.740	.00	.93	.13	.30
	4	.015	16.114	.15	.04	.81	.69

- a. Dependent Variable: usage of HRIS
- b. Predictors (constant): X1=Management participation, X=3Internal structure of the organization, Z=Effect of external environment,X2= Infrastructure

#### 4.5.7 Correlation Analysis of Independent Variables

Correlation analysis gives the relationship between variables. In this study, Pearson product moment correlation coefficient (*r*'s) was used to establish the relationship between the independent variables. The correlation coefficients are summarized in Table 4.15. The findings also reveal that there was significant relationship between the independent variables since all the p-values were less than 0.01 that is p- values 0.000 <0.01. Even though there was a significant relationship between the independent variables, there was no problem of multi-collinearity among the variables since all the r values were less than 0.8 as suggested by Tabachnick and Fidel (2001).

**Table 4.15 Correlation Analysis of Independent Variable without Moderator Effect of External Environment**

		Management Participation	Infrastructure	Internal Structure of the Organization
Management Participation	Pearson Correlation	1	.629**	.430**
	Sig. (2-tailed)		.000	.000
	N	131	122	124
Infrastructure	Pearson Correlation	.629**	1	.526**
	Sig. (2-tailed)	.000		.000
	N	122	130	123
Internal Structure of the Organization	Pearson Correlation	.430**	.526**	1
	Sig. (2-tailed)	.000	.000	
	N	124	123	132

\*\* . Correlation is significant at the 0.01 level (2-tailed).

In the presence of moderator, correlation coefficient r values were above 0.8 and the relationship among the independent variable was significant. Since the r values were above 0.8, Tabachnick and Fidel (2001) rule of thumb was contradicted hence

probably there was a problem of multicollinearity this therefore suggests that the model was good enough in the absence of moderator (see Table 4.16).

**Table 4.16: Correlation Analysis of Independent Variable with Moderator Effect of External Environment.**

		Management Participation	Infrastructure	Internal Structure of Organization
Management Participation	Pearson Correlation	1	.848**	.829**
	Sig. (2-tailed)		.000	.000
	N	127	121	121
Infrastructure	Pearson Correlation	.848**	1	.848**
	Sig. (2-tailed)	.000		.000
	N	121	127	121
Internal Structure of Organization	Pearson Correlation	.829**	.848**	1
	Sig. (2-tailed)	.000	.000	
	N	121	121	127

\*\* . Correlation is significant at the 0.01 level (2-tailed).

On the other hand Variance Inflation Factor (VIF) and Tolerance values may also be used to test the multicollinearity. VIF values greater than 1 suggest that multicollinearity may be biasing the regression model, Bowerman and Connell (1990) but tolerance value below 0.2 are worthy of concern. Tolerance value may be described as the reciprocal of VIF. According to the findings in Table 4.29 the tolerance values were very far above 0.2 for the case of model 1 (where there is no moderator) while slightly above 0.2 for the case of model 2 where there is moderator. This therefore suggests that there was no multicollinearity problem for the two regression models but model 1 was more superior compared to model 2.

#### **4.5.8 Test for Autocorrelation (independent of errors)**

The assumption is that for any observations the residual terms should be uncorrelated (independent). This assumption was tested using the Durbin- Watson test which tests

for serial correlations between errors. It tests whether the adjacent residuals are correlated.

A value of 2 means the residuals are uncorrelated, a value greater than 2 indicates a negative correlation between adjacent residuals, whereas a value below two indicates a positive correlation (Field, 2009). However Durbin-Watson statistical values less than 1 or greater than 3 are definitely cause for concern. In this study the Durbin-Watson statistical values were 1.57 and 1.476 without moderator (model 1) and with moderator (model 2) respectively Table 4.17. The findings suggest that the residual terms were independent.

**Table 4.17: Overall Model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.720 <sup>a</sup>	.518	.505	3.98943	1.570
2	.635 <sup>a</sup>	.404	.387	4.36965	1.476

a. Predictors: (Constant), X<sub>3</sub>, X<sub>1</sub>, X<sub>2</sub> model 1 and model 2

b. Dependent Variable: Usage of HRIS ( Y)

#### 4.6 Inferential Tests

Correlation, linear regression and analysis of variance (ANOVA) were conducted to establish the nature of relationship between independent variables and dependent variable.

4.6.1 Objective one: To analyze the effects of management participation on the usage of human resource information systems in TSC operations in Kenya.

The objective was tested using the hypotheses one which stated that; *H<sub>0</sub>: There is no significant association between management participation and usage of human resource information systems in TSC operations in Kenya.*

### Analysis and discussion

The test was conducted using the linear regression model. First is the model summary showing the correlation (R) and the coefficient of determination R square. The degree to which two or more predictors (X) are related to the dependent (Y) variable is expressed in the correlation coefficient R, and in multiple regressions the R square value can assume values between 0 and 1.0. The R-square is an indicator of how well the model fits the data. An R- square value which is close to 1.0 indicates that the dependant variable entirely depends on the independent variables while a value close to 0 indicates no correlation between the explanatory variables and the dependent variable (Ming'ala, 2002). Table 4.18 shows the regression analysis findings between usage of HRIS and management participation.

**Table 4.18 Regression analysis for management participation and usage of HRIS**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.625 <sup>a</sup>	.390	.385	4.42136
2	.609 <sup>a</sup>	.371	.366	4.44154

a. . Model 1 and 2 Predictors: (Constant), Management participation and management participation with moderator effect of external environment (EEE)\*Z

b. Dependent Variable: usage of HRIS

From the Table 4.18, the value of R- square without the moderating variable was 0.390. This implied 39.0% of usage of HRIS could be explained by Management Participation. However with the moderating variable, effect of external environment, the R- square value reduced to 0.371, (37.1%) but there was still some significant influence of management participation on usage of HRIS.

### ANOVA

This finding was further illustrated in the Analysis of Variance Table 4.19. Where, the p-value was 0.000 which was less than 0.05. This was the case without moderating variable effect of external environment. It therefore implied that there was a significant relationship between management participation and usage of HRIS in TSC operations in Kenya. This meant management participation through the attitude and willingness of top leadership to support and embrace HRIS contributed to usage of HRIS in TSC operations. However external environment moderated the effect of this predictor variable in terms of government policies and provision of funds, as well as influence of the clients the organization interacted with.

**Table 4.19 ANOVA for Management Participation (X<sub>1</sub>)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1538.746	1	1538.746	78.715	.000
	Residual	2404.454	123	19.548		
	Total	3943.200	124			
2	Regression	1350.896	1	1350.896	68.479	.000
	Residual	2288.367	116	19.727		
	Total	3639.263	117			

a. Dependent Variable: usage of HRIS (Y)

b. Model 1 and 2 Predictors: (Constant), X<sub>1</sub> and X<sub>1</sub>\* EEE

From the coefficient Table 4.20 t- test was also used to test the relationship between the predictor variable management participation and usage of HRIS and there was significance relationship between the two variables with or without moderator with p-value= 0.000 < 0.05 for model 1 and 2. The regression equations between usage of HRIS and management participation for the two models can be expressed as;  $Y=11.631+ 0.563X_1$  and  $Y=18.950+ .009X_1$ . The two models indicated that for every unit management participation values changes by 0.563 for model one and 0.009 for model two. These results were also supported by the descriptive analysis where 62% agreed that top managements involvement was crucial in encouraging usage of HRIS. These results collaborate the diffusion of innovation theory that the level of innovation and adoption is related to individual leader characteristics and attitude toward change.

**Table 4.20: Coefficients<sup>a</sup> for Management Participation (X<sub>1</sub>)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Mgt participation	11.631	1.988		5.849	.000
	.	.563	.063	.625	8.872	.000
2	Mgt participation	18.950	1.261		15.027	.000
	.	.009	.001	.609	8.275	.000

a. Dependent Variable: usage of HRIS

From the aforesaid the null **hypothesis is rejected** and we accept the alternative hypothesis and conclude that management participation has significant influence on usage of HRIS. A study by Rycroft and Kash (2009) showed that when management

skills and activities are practiced then management is able to deal with complexities, uncertainty and uniqueness of their organizations. In addition, this is supported by the diffusion of innovation theory where individual leaders attitude towards change affects obtaining organizational 'buy-in' regarding the strategic contribution of the HRIS has been in some cases been hindered by skepticism, a lack of understanding, insufficient management commitment, and fears that existing modes of work will be changed and result in for example job loss or altered leave entitlements and shift arrangement (Dery *et al.*, 2006). This underpins the role of management in usage of HRIS.

#### **4.6.2 Objective two: To establish the effects of infrastructure on the usage of human resource information systems in TSC operations in Kenya**

The objective was tested by hypotheses two which stated that; *H<sub>0</sub>: There is no association between infrastructure and usage of HRIS in TSC operations, Kenya.*

#### **Analysis and discussion**

The Pearson's product moment correlation statistic was used to test the relationship between the infrastructure and usage of HRIS. The R square value without the moderating variable showed that 0.339 (33.9%) of usage of HRIS was explained by infrastructure but went slightly up to 0.347 (33.7%) with the moderating variable as shown in Table 4.21 below. This was quite significant at. These results indicated that there was a positive significant effect between infrastructure and usage of HRIS in the operations of TSC at 0.05.

**Table 4.21: Regression analysis for infrastructure (X<sub>2</sub>) and usage of HRIS**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.582 <sup>a</sup>	.339	.334	4.71036	1.399
2	.589 <sup>a</sup>	.347	.342	4.65683	1.366

a. Model 1 and 2 Predictors: (Constant) X<sub>2</sub> and X<sub>2</sub>\*EEE

c. Dependent Variable: Usage of HRIS

This finding was further collaborated by the results of Analysis of Variance (ANOVA) as shown in Table 4.22. In both cases that is with and without the moderating variable the value was 0.000 which is less than 0.05. Statistically it meant there was a significant relationship between infrastructure and usage of HRIS. This supported the findings that affirmed scarcity or unavailability of IT equipment was an impediment to level of usage of HRIS. The findings echo the enterprise resource planning model which was indicative of the fact that technological IT resources include two sets: IT infrastructure that provides the shared foundation of IT capability and the human IT resources.

**Table: 4.22 ANOVA<sup>a</sup> for Infrastructure (X<sub>2</sub>)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1432.807	1	1432.807	64.577	.000
	Residual	2795.622	126	22.187		
	Total	4228.430	127			
2	Regression	1361.371	1	1361.371	62.776	.000
	Residual	2558.954	118	21.686		
	Total	3920.325	119			

a. Dependent Variable: usage of HRIS

b. Model 1 and 2 Predictors: (Constant), X<sub>2</sub>

### Coefficient: Infrastructure (X<sub>2</sub>)

Further the regression coefficient without moderating variable showed a p- value of 0.000 which is less than 0.05, significance level. The value was the same with the moderating variable, effect of external environment. The model generated from the coefficient table is given as  $Y=13.939+ 0.461X_2$

**Table 4.23 Coefficients<sup>a</sup> for infrastructure (X<sub>2</sub>)**

Model		Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1		13.939	1.892		7.366	.000
	Infrastructure	.461	.057	.582	8.036	.000
2		19.711	1.209		16.310	.000
	Infrastructure	.007	.001	.589	7.923	.000

The findings are in line with the descriptive analysis which indicated that there was scarcity of networked facilities to serve the commission especially in the county offices where they had only two computers at most, and frequent system failures notwithstanding. From the linear regression analysis it was conclusively decided that there was significant relationship between infrastructure and usage of HRIS, **hence the null hypothesis was rejected** and the alternative adopted that there is significant statistical effect of infrastructure on usage of HRIS.

Rycroft and Kash (2009) support this view that it is important to link technology to innovation in sustaining competitiveness. In addition, in a study of four Australian universities Vries (2006) observed that a number of respondents identified the scarcity or unavailability of equipment and financial resources for maintaining HRIS as a barrier to sustainability.

**4.6.3 Objective three: To analyze the effects of internal structure of an organization on the usage of human resource information systems in TSC operations in Kenya.**

**This objective was tested using hypothesis three, that;  $H_0$ : there is no association between internal structure of an organization and usage of HRIS in TSC operations in Kenya.**

**Analysis and discussion**

To test the hypotheses linear regression model was used as shown in Table 4.24. The coefficient determinant, R- square without the moderating variable was 0.284 and 0.364 with the moderating variable. This therefore implies internal structure of the organization explained at least 28.4 % of variability of usage of HRIS, without moderating variable and 36.4% when there was a moderating variable which was quite significant. From the findings, internal structure of the organization in TSC emphasized centralization and formalization with strict adherence to set procedures. This often became an impediment to creativity and slowed decision making. However unlike the other two predictor variables; management participation and infrastructure, the moderating variable increased the effect of internal structure of the organization on of usage of HRIS as opposed to lowering it.

**Table 4.24: Regression Analysis for ISO ( $X_3$ ) and usage of HRIS**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.533 <sup>a</sup>	.284	.278	4.80261	1.555
2	.604 <sup>a</sup>	.364	.359	4.47889	1.482

a. Model 1 and 2 Predictors: (Constant),  $X_3$  and  $X_3$   
 Dependent variable: usage of HRIS(Y)

### ANOVA: Internal Structure of the Organization

Analysis of Variance results for regression coefficients revealed that the significance of p values was 0.000 which is less than 0.05 hence the null hypothesis was rejected. The implication was that there was a significant positive relationship between internal structure of the organization and usage of HRIS in the operations of TSC. This is as shown in the Table 4.25.

#### 4.25. ANOVA for Internal Structure of the Organization (X<sub>3</sub>)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1151.525	1	1151.525	49.925	.000 <sup>b</sup>
	Residual	2906.194	126	23.065		
	Total	4057.719	127			
2	Regression	1367.951	1	1367.951	68.192	.000 <sup>b</sup>
	Residual	2387.189	119	20.060		
	Total	3755.140	120			

a. Dependent Variable: usage of HRIS (Y)

b. Model 1 and 2 Predictors: (Constant), X<sub>3</sub>

### Coefficient

The coefficient regression equation between internal structure of the organization and usage of HRIS can be expressed as;  $Y = \beta_0 + \beta_1 X_3$  which results to  $Y = 14.271 + 0.542X_3$  when there is no moderator and  $Y = 18.537 + 0.1X_3$  with moderator from the coefficient Table 4.26.

The p values with and without the moderating variable (Effect of External Environment) are 0.000 which were less than 0.05. This further implies that there was a positive significant relationship between internal structure of the organization and usage of HRIS in the operations of TSC in Kenya.

**Table 4.26 Coefficient for Internal Structure of Organization (X<sub>3</sub>)**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	14.271	2.121		6.729	.000
	Internal structure of organization	.542	.077	.533	7.066	.000
2	(Constant)	18.537	1.317		14.080	.000
	Internal structure of organization	.010	.001	.604	8.258	.000

From the analysis it was therefore, concluded that the **third null hypothesis be rejected** and the alternative be accepted; **there is a significant relationship between internal structure of the organization and usage of HRIS**. According to (Ivancevich *et al.*, 2006), an organization’s structure is considered to be the “anatomy of the organization, providing a foundation within which the organization functions. This underscores the importance of internal structure of an organization in usage of new technology; in this case HRIS.

These findings are validated by the institutional theory which pointed out the fact that organizational decisions are not driven purely by rational goals of efficiency but also concerns for legitimacy. They are also transported by structures and routines. The theory also observes that as the strategy of an organization is articulated, technology, structure and processes should be linked to it which was not the case with the TSC. The findings indicated there was minimal departmental networking and less devotion in exploring new ideas as opposed to maintaining the status quo.

#### 4.6.4 Overall model summary

Objective four: To analyze the moderating effect of external environment on the relationship between the independent variables (management participation, infrastructure, internal structure of the organization) and usage of HRIS in **operations of TSC in Kenya**. This was tested using the fourth hypotheses:  $H_0$ : *There is no association between external environment and usage of HRIS in TSC operations in, Kenya.*

#### Analysis and discussion

From Table 4.27, 51.8% usage of HRIS was explained by the three variables: management participation, infrastructure, and internal structure of the organization. However the figure dropped to 40.4% when the moderating variable was, effect of external environment, was present. The optimal model was model 1 (without moderator) since it registered a higher R square value than model 2 (with moderator).

**Table 4.27: Overall Model summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.720 <sup>a</sup>	.518	.505	3.98943	1.570
2	.635 <sup>a</sup>	.404	.387	4.36965	1.476

d. Predictors: (Constant), X<sub>3</sub>, X<sub>1</sub>, X<sub>2</sub> model 1 and model 2

b. Dependent Variable: Usage of HRIS ( Y)

#### Overall ANOVA

The purpose of ANOVA is to test differences in variables for statistical significance (Obure 2002). If significant we reject the null hypothesis and accept the alternative hypothesis. The p- value for the first model without moderating variable and the second with moderating variable are both 0.000 which is less than 0.05. This implies

there is a significant relationship between the independent variables; Management participation, infrastructure and internal structure of the organization and dependent variable usage of HRIS. Moreover the effect of external environment is also significant and cannot be ignored.

**Table 4.28: ANOVA <sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1898.123	3	632.708	39.754	.000 <sup>b</sup>
	Residual	1766.625	111	15.916		
	Total	3664.748	114			
2	Regression	1356.705	3	452.235	23.685	.000 <sup>b</sup>
	Residual	2004.854	105	19.094		
	Total	3361.560	108			

a. Dependent Variable: usage of HRIS (Y)

b. Predictors: (Constant), X<sub>3</sub>, X<sub>1</sub>, X<sub>2</sub> model 1 and model 2

### Overall coefficient

From Table 4.29 the regression model equation fitted using unstandardized coefficients without moderating variable (model 1) is;

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$  where Y is usage of HRIS.

$$Y = 4.96 + 0.389X_1 + 0.173X_2 + 0.238X_3$$

X<sub>1</sub> is management participation

X<sub>2</sub> is infrastructure

X<sub>3</sub> is internal structure of the organization

The regression model equation with the moderating variable Z (model 2) is;

$$Y = 17.487 + 0.005X_1Z + 0.00X_2Z + 0.005X_3Z$$

X<sub>1</sub> is management participation

X<sub>2</sub> is infrastructure

X<sub>3</sub> is internal structure of the organization

Z is effect of external structure of the organization.

The results of the t-test revealed that the p- value was less than 0.05 without the moderating variable effect of external environment for all the variables. With the moderating variable, p-value for infrastructure was 0.837 an internal structure of organization was 0.076 which were above 0.05 indicating that infrastructure and internal structure of organization had no influence on usage of HRIS. Management participation had the highest significance on usage of HRIS at 0.389 without a moderator and even higher 0.837 with a moderator. Management's willingness to commit resources and formulating policies that enhance usage of HRIS is critical to the level of usage of HRIS in operations of TSC. Management is yet to embrace HRIS as important in making timely decisions. The other variables had less significance in comparison. In conclusion it was deduced from the R square values that in presence of the moderator, the model 2 was less optimal compared to model 1 (without moderator). Therefore the moderating variable external environment should be discarded.

**Table 4.29: Overall Coefficient**

Model	Unstandardized Coefficients		Beta	t	Sig.	Collinearity Statistics	
	B	Std. Error				Tolerance	VIF
<b>Model 1</b>							
(Constant)	4.946	2.257		2.191	.031		
X <sub>1</sub>	.389	.077	.417	5.051	.000	.636	1.573
X <sub>2</sub>	.173	.069	.219	2.510	.014	.570	1.754
X <sub>3</sub>	.238	.084	.227	2.849	.005	.685	1.459
<b>Model 2</b>							
(Constant)	17.487	1.435		12.185	.000		
X <sub>1</sub> Z	.005	.002	.360	2.395	.018	.251	3.979
X <sub>2</sub> Z	.000	.002	.034	.207	.837	.207	4.836
X <sub>3</sub> Z	.005	.003	.274	1.790	.076	.242	4.126

**Content analysis**

The findings as to how else management participation would enhance the usage of HRIS were as follows: Management needed to train staff on usage of HRIS and also familiarize itself on the usage of systems such as customer relation management system. The study revealed that HRIS systems failed to take off because they lacked complete support from top management. The field offices wanted a networked system that would allow them to access information quickly and easily by connecting them to other field offices as well as the headquarters. Top management needed to steer the organization positively since they had a bias in using written memos and circulars as opposed to electronic communication within the organization.

The responses on infrastructure indicated that power failures and poor installation of HRIS were seen as an impediment to usage of HRIS infrastructure. Quality of computers also affected usage of HRIS since some were said to ‘hang’ frequently

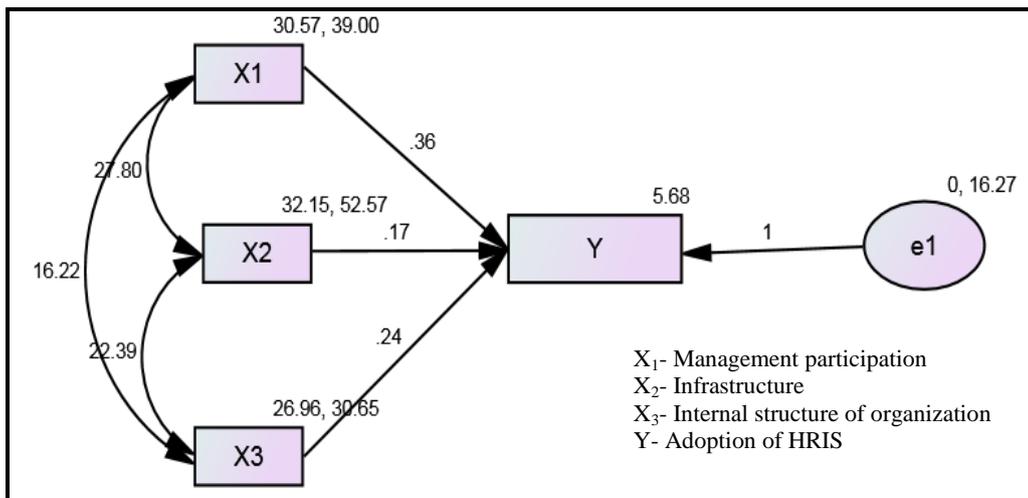
while the generator failed to power all computers in case of electricity failure. In addition it was observed that TSC should also install appropriate operating systems.

Internal structure of TSC was said to affect usage of HRIS in that it failed to involve the lower cadre when introducing new systems. In some cases they were expected to consume and implement the product yet their opinions were never sought any stage of implementation. The structure of the organization was blamed for bureaucracy. The directors should interact with the HRIS directly since it was indicated that they were detached with the systems. TSC should enable staff to generate relevant reports using HRIS. This study therefore brought out another variable that is worth considering when management intends to introduce new technology; client involvement.

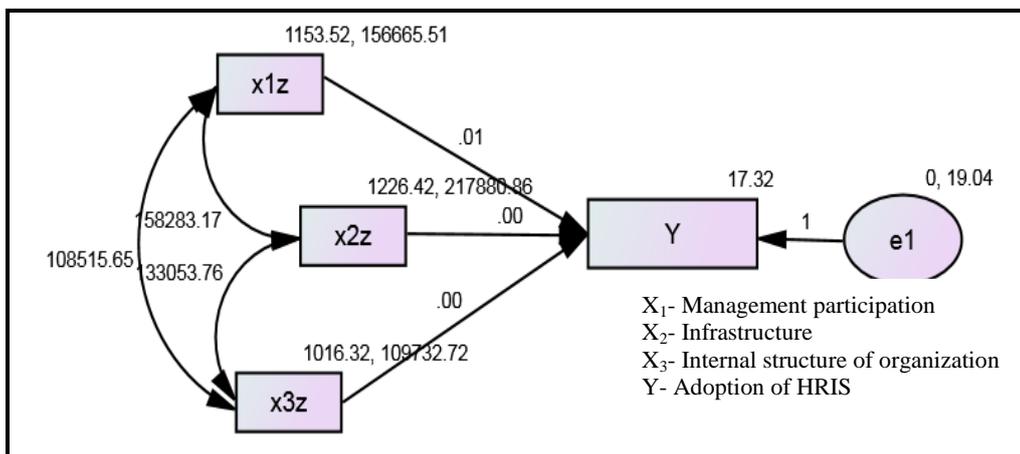
#### **4.6.5 Structural Equation Model**

Alternatively, analysis of moment structures (AMOS) was also used to perform regression analysis between dependent variables and independent variables. In this approach structural equation modeling (SEM) also known as analysis of covariance structures or casual modeling was used. SEM is a comprehensive statistical approach for testing the hypothesis and linear relations between variables. It is also used to find out whether the model fits well using fit indices (Moss, 2009). If the model is acceptable then there is need to investigate whether the specific paths are significant. The most widely used fit indices as described by Hooper, Coughian and Mullen (2008) are the Comparative Fit Index (CFI), Goodness Of Fit Index (GFI), Adjusted Goodness Of Fit Index (AGFI), and Root Mean Square Error Of Approximation (RMSEA) In this study SEM analysis was done to find out the effect of independent variables; management participation, infrastructure, internal structure of the organization on usage of human resource information systems in TSC operations in

Kenya. The Figure 4.6 shows Structural Equation Modeling (SEM) without a moderator and Figure 4.7 shows SEM with a moderator. Similarly model parameter without and with moderator are shown in Tables Table 4.30 and 4.31 respectively. The same values are displayed on the both figures as regression weights which are the same as the earlier findings on regression mode



**Figure 4.6 structural equation model (SEM) without moderator.**



**Figure 4.7 structural equation model (SEM) with moderator**

Again Table 4.30 shows summary of regression based on SEM and the results are similar to the ones shown in Table 4.27. Apart from regression weights, Table 4.30

also indicates covariance values between the variables which basically show the strength of relationship between the predictor variables.

**Table 4.30 Model parameter table (without moderator)**

<u>Regression Weights: (Group number 1 - Default model)</u>						
			Estimate	S.E.	C.R.	P
Y	<---	X <sub>3</sub>	.241	.080	3.015	.003
Y	<---	X <sub>2</sub>	.173	.069	2.529	.011
Y	<---	X <sub>1</sub>	.360	.075	4.813	***
<u>Intercepts: (Group number 1 - Default model)</u>						
Y			5.683	2.070	2.745	.006
<u>Covariances: (Group number 1 - Default model)</u>						
X <sub>1</sub>	<-->	X <sub>3</sub>	16.218	3.321	4.884	***
X <sub>3</sub>	<-->	X <sub>2</sub>	22.386	3.974	5.632	***
X <sub>1</sub>	<-->	X <sub>2</sub>	27.796	4.601	6.041	***
<u>Variances: (Group number 1 - Default model)</u>						
X <sub>1</sub>			39.001	4.799	8.216	***
X <sub>3</sub>			30.648	3.746	8.182	***
X <sub>2</sub>			52.574	6.413	8.198	***
e			16.273	2.027	8.028	***

**Table 4.31: Model parameter table (with moderator)**

<u>Regression Weights: (Group number 1 - Default model)</u>						
			Estimate	S.E.	C.R.	P
Y	<---	x3z	.02	.00	6.88	***
Y	<---	x4z	-.01	.00	-2.61	.01
Y	<---	x2z	.12	.02	7.00	***
Y	<---	x1z	.00	.00	-.89	.37
<u>Intercepts: (Group number 1 - Default model)</u>						
Y			30.22	1.43	21.16	***
<u>Covariances: (Group number 1 - Default model)</u>						
X1z	<-->	x1z	108515.65	14901.14	7.28	***
x3z	<-->	x1z	133053.76	17835.78	7.46	***
X1z	<-->	x1z	158283.16	21310.25	7.43	***
<u>Variances: (Group number 1 - Default model)</u>						
X1z			15666.513	19525.04	8.024	***
X3z			109732.720	13609.720	8.063	***
X2z			217880.862	27051.373	8.054	***
e			19.044	2.395	7.952	***

#### **4.6.6. Model Fit Summary**

Using SEM model fit summary generated it was clear that model 1 was better compared to model 2 that is model 1 was acceptable.

According to Moss (2009), most widely used fit indices are the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI) and Root Mean Square Error of Approximation (RMSEA). The above fit index show how good the model is. In this study, CFI, GFI, AGFI and MSEA were used to test whether both overall models were good enough.

#### **The Comparative Fit Index**

The Comparative Fit Index (CFI) is a fit index popularly used because it is least affected by sample size and it takes into account a sample size that performs well even if the sample size is small (Tabachnick & Fidell, 2013). The value for this statistics ranges between 0 and 1. Values closer to 1 indicate a good fit. The result of the study as displayed in Table 4.32 proved that model 1 was a good fit since the value was 1.00 while it was 0.000 for model 2.

#### **Goodness of Fit Index**

Goodness of Fit Index- GFI is used to measure the amount of variance and covariance in the observed correlation matrix. Values between 0.9 and 1 are acceptable (Arbuckle & Wothke, 1999). The GFI for model 1 was good enough since it was 0.979 and 0.383 for model 2. Therefore model one met the threshold. This therefore means Management Participation, Infrastructure and Internal Structure of the Organization had a significant influence on usage of HRIS in the operations of TSC country wide. However the scenario changes in the presence of a moderator.

The effect of external environment did not impact significantly on the independent variables since the GFI was 0.383 way below the threshold.

#### **Adjusted Goodness of Fit Index (AGFI)**

Adjusted goodness of fit index (AGFI) is another version of GFI which corrects GFI affected by the number of indicators of each latent variable. The values of AGFI range between 0 and 1 and for a good fit, value must be 0.9 and above. In the study the AGFI was 0.945 without a moderator and 0.173 with a moderator as shown in Table 4.32.

#### **Root Mean Square Error of Approximation**

Root Mean Square Error of Approximation (RMSEA) shows how inappropriate the model fits the data by considering the error in the Approximation. RMSEA Values less than 0.1 are allowed (Byrne, 2001). Table 4.32 is a befitting indication that all the model fits met the required threshold value.

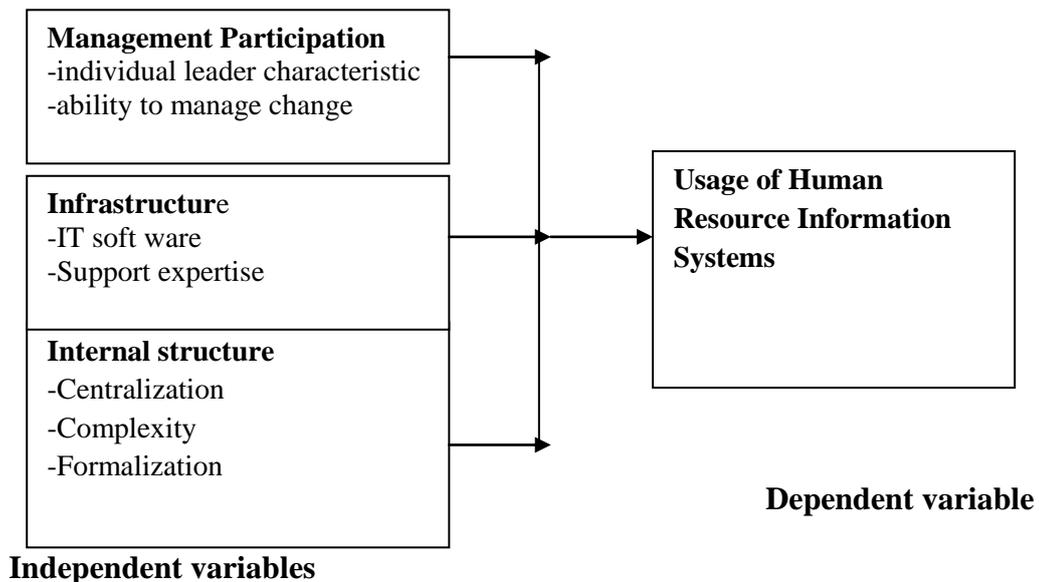
**Table 4.32 Model Fit Summary**

	<b>MODEL</b>	<b>CFI</b>	<b>GFI</b>	<b>AGFI</b>	<b>RMSEA</b>
1	Default model	1.000	0.979	0.945	0.060
Without moderator	Saturated model	1.000	1.000		
	Independence model	0.000	0.000	0.002	0.123
2	Default model	0.872	0.745	0.722	0.127
With moderator	Saturated model	1.000	1.000		
	Independence model	0.000	0.383	0.173	0.246

#### **4.6.7 Optimal Model**

Based on the tests conducted in this study it was concluded that the independent variables (Management Participation, Infrastructure, Internal Structure of the Organization,) influenced the dependent variable (Usage of HRIS). The moderating variable (Effect of External Environment) was found to have a moderating effect on

the relationship between independent variables and dependent variable since it lowered the influence of Management Participation, Infrastructure and Internal Structure of the Organization on Usage of HRIS. Moreover by comparing the overall regression model 1 (without moderator) with overall regression model 2 (with moderator) in Table 4.32 it was clear that R squared value for model 1 was greater than R squared value for model 2 that is  $R_1^2 > R_2^2 = 0.518 > 0.404$  meaning that Effect of External Environment had a moderating effect on the overall model. In addition Table 4.37 shows that CFI, GFI, AGFI and RMSEA values for model 2 were lower than for model 1. Consequently based on the research findings the proposed study model was retained as the optimal model given by the expression  $Y=4.96 + 0.389X_1 + 0.173X_2 + 0.238X_3$  The new conceptual framework is therefore as displayed on Figure 4.8.



**Figure 4.8: revised conceptual model.**

## **CHAPTER FIVE**

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

#### **5.1 Introduction**

This chapter presents the summary of the study which sought to investigate the determinants of usage of HRIS in the operations of TSC in Kenya. The study was guided by specific objectives, research questions and hypotheses. This chapter therefore presents the summary of the research work, conclusions drawn from the study, recommendations and areas of further research in relation to the data analysis.

#### **5.2 Summary of findings.**

From the theoretical information garnered HRIS is meant to convert data from internal and external sources into information and to communicate that information, in an appropriate form, to managers at all levels in all functions to enable them to make timely and effective decisions for planning, directing and controlling the activities for which they are responsible. In short HRIS should be a tool for improving the management of human resource issues. The study employed exploratory and descriptive research design. The target population was the employees of Teachers Service Commission across Kenya, 3000 in number. A sample of 206 was drawn from the middle level and the top level management. A questionnaire containing semi structured questions and a likert scale was used for collecting data. Out of 206 respondents given the questionnaire 140 employees which was 67.9% responded. This is considered adequate, as espoused by (Mugenda & mugenda 2003).

Pilot testing was done using a sample of 35 questionnaires where reliability, validity and factor analysis was performed. This helped improve the research instrument greatly. The principal component analysis method (PCA) was used to extract factors with reliability cut-off value of 0.70 while discarding the factor loadings that were less than 0.40. Responses for each predictor variable were presented in descriptive statistics. Further multiple regression which involved analysis of variance, coefficients model summary and Analysis of moment structures (AMOS) was conducted and the findings from the analysis used to test the null hypotheses for each objective. Correlation analysis to test relationship between independent variables was done using Pearson product moment correlation coefficient ( $r$ 's). In the study there was no problem of multi-collinearity among the variables since all the  $r$  values were less 0.8.

### **5.2.1 Effect of Management Participation on Usage of HRIS in Operations of TSC**

**Specific objective 1: To analyze the effects of management participation on the usage of human resource information systems in TSC operations in Kenya.**

From the findings based on descriptive analysis, most respondents agreed that management participation affected usage of HRIS in the operations of TSC throughout the country. Management participation was indicated by presence of official policies and procedures for managing email records and allocation of adequate funds. All these emanated from decisions made by top management at the TSC. Most respondents especially from North Eastern and Coast regions were positive that HRIS would help managers to make timely decisions. Decision making as well as Communication between TSC offices in the counties and the headquarters

took long due to lack of HRIS usage. The findings from Kwale ,Embu and Garissa indicated that HRIS should be expanded to interact with all directorates at TSC headquarters as well as the county offices spread across Kenya as opposed to an ICT department that exists in isolation. This would enhance operations of TSC in the field offices thus save money and time spent travelling to TSC headquarters.

Moreover the correlation, regression and analysis of variance pointed to a positive significant relationship between management participation and usage of HRIS in the operations of TSC in Kenya with or without moderator with  $p\text{-value} = 0.000 < 0.05$ . The fact that there is an ICT directorate does not necessarily mean that HRIS will fully take off. There was need to integrate ICT with other directorates as opposed to working in isolation oblivious of the overall operations of the organization across the country. Information specialists needed to be acquainted with the needs of management so that they could generate relevant reports. In addition management would need to have ICT officers at the TSC county offices to address challenges faced in usage of HRIS in the country. The findings for each variable could be summarized as follows.

### **5.2.2 Effect of Infrastructure on Usage of HRIS in Operations of TSC.**

**Objective two: To establish the effects of infrastructure on the usage of human resource information systems in TSC operations in Kenya.**

The findings of descriptive statistics showed that majority of the respondents were of the opinion that IT facilities at the TSC were not enough; the county offices in Nyeri, Embu, Nakuru, Garissa, Kisumu and Kwale lacked enough computers. At the TSC headquarters the HR directorate suffered system failures that slowed down its

operations. The servers needed upgrading to match the massive and workload. However there was a system that integrates all employees' information with payroll and financial software. This is the integrated personal pay roll data (IPPD) which is true of all public organizations in Kenya. However half of the respondents did not agree there were adequate networked facilities to serve the ICT needs of the organization.

The Pearson's product moment correlation statistic was also indicative of the fact that infrastructure had a significant effect on adoption of HRIS. This finding was further collaborated by the results of Analysis of Variance (ANOVA) and the regression coefficient. These findings indicated that scarcity or unavailability of equipment and financial resources for maintaining HRIS are a barrier to usage and sustainability of HRIS.

### **5.2.3 Effect of Internal Structure of the Organization on Usage of HRIS in operations TSC.**

**Objective three: To analyze the effects of internal structure of an organization on the usage of human resource information systems in TSC operations in Kenya.**

The internal organization structure of most organizations is based primarily on arrangement and grouping of personnel to accomplish tasks. A strongly hierarchical structure is characterized by ranks in which superiors direct actions of their subordinates toward the goals of the company. The study investigated whether internal structure had any effect on the usage of HRIS in TSC operations in Kenya.

The internal structure of the organization was found to have a significant effect on usage of HRIS in TSC operations in Kenya. According to the descriptive statistics majority disagreed that creativity was encouraged at TSC and that TSC was more committed to improving existing operations than exploring new ideas. Most of the operations in the county offices were slowed down by the reporting structures that require them to wait for response that would need consultations at the headquarters first. This therefore slowed implementation, usage and interest in HRIS. The structure of TSC was to blame for delay in decision making and suffocating creativity. The organization was decentralized as opposed to being devolved. Therefore most decisions at county offices were tethered to the headquarters. The organization operated routinely through formalized structures and processes. Most respondents agreed that directors held regular meetings and that TSC as an organization did not respond well to changes in its environment. The respondents were also positive that there was a functional welfare where they chose their own leaders. However the county directors from Nakuru, Kisumu, Embu, and Kwale felt less involved in the elections of the leaders.

Analysis of Variance results for regression coefficients revealed that the significance of p values was 0.000 which is less than 0.05 implying internal structure of TSC was a key element in influencing usage of HRIS. These findings strongly suggest that usage of a new system may require a review of the organizations internal structure to accommodate flexibility. The implication was that there was a significant relationship between internal structure of the organization and usage of HRIS. Top management decides on the organization structure and policies governing the operations of each directorate. The findings are consistent with Miles and Snow

(2003); Geek (2013) who observe that the structure of an organization supports the primary manner in which tasks that ultimately contribute to the goals of the organization are accomplished. The meetings for all directorates are meant to ensure that the whole organization functions as a system where directorates are subsystems that contribute to the whole.

#### **5.2.4 Effect of External Environment on Usage of HRIS in operations of TSC**

**Objective four: To analyze the moderating effect of external environment on the relationship between the independent variables (management participation, infrastructure, internal structure) and usage of HRIS in TSC.**

From overall model summary external environment had a moderating effect on the usage of HRIS. This is because in the overall model it was found to lower the R squared value albeit slightly. The optimal model was the one without a moderator since it registered a higher R square value than one with a moderator.

The results of ANOVA showed the p- values for the first model without moderating variable and the second with moderating variable were both 0.000 which is less than 0.05. This implied the moderating variable effect of external environment had some significance on usage of HRIS in the TSC operations in Kenya. The results were the same using the overall coefficient. In conclusion it was deduced from the R square values that in presence of the moderator, the model was less optimal compared to without moderator. From the findings of the study, global trends, relationship with customers of TSC, government support and other organizations that are using HRIS were the external influences in the TSC environment. The moderating effect on the three predictor variable was not uniform. The effect of management participation on

usage of HRIS was higher without a moderator than with a moderator the same for infrastructure. However for the variable Internal Structure of the Organization had a higher influence on usage of HRIS in the presence of a moderator but lower in its absence. The findings are consistent with Quddus and Hofmeyer (2007); Miles and Snow (2003) who pointed out that the behavior of certain environmental elements can be reliably predicted while that of others cannot. The impact of some conditions can be buffered while the impact of others cannot; and some factors are critical to the organizations operations while others are only incidental.

### **5.3 Conclusion**

#### **Effect of management participation on usage of HRIS in the operations of TSC in Kenya**

The conclusion drawn from the study is that management participation had a significant effect on usage of HRIS in the operations of TSC in Kenya. From the study it was deduced that there were no official policies and procedures put in place to guide on usage of HRIS. The attitude of top management had a negative effect on usage of HRIS. In addition, the resource committed were not enough to put up adequate infrastructure to cover all TSC offices across the country therefore deterring effective usage of HRIS. In addition, this study established that management participation had a greater influence on usage of HRIS in comparison to the other variables in this study. Management did not manage change that resulted from introduction of HRIS and it also failed to integrate ICT with other directorates as opposed to being a stand-alone directorate.

### **Effect of infrastructure on usage of HRIS in the operations of TSC in Kenya.**

The findings of this study established that infrastructure had an inverse effect on usage of HRIS in the operations of TSC in Kenya. Insufficient IT facilities as well as inadequate networked facilities affected adoption of HRIS. However the presence of a system that integrated all employees' information with payroll and financial software was a positive move in usage of HRIS. This was however the case in all public organizations where integrated personal payroll data (IPPD) is used and could not be attributed as an upgrading of usage of existing ICT by TSC. Empirical results from this study revealed that that scarcity or unavailability of equipment and financial resources for maintaining HRIS were a barrier to sustainability of HRIS. Computers were not enough coupled with frequent system failures due to weak servers that needed upgrading.

### **Effect of internal structure of the organization on usage of HRIS in the operations of TSC in Kenya**

Based on the findings, internal structure of the organization significantly affected usage of HRIS, in the TSC operations in Kenya. However this relationship was a weak one. Whereas for other variable the moderating variable lowered the R squared value in the case of internal structure of the organization the value increased. It was revealed from the study that creativity was not encouraged at the Teachers Service Commission. Instead there was more emphasis in improving existing operations than exploring new ideas. This was attributed to TSC structure which was based on strict hierarchical control. Consequently it suffocated creativity and flexibility thus explaining the lack of interconnectedness between departments in the operations of

the TSC across Kenya. The structure also delayed decision making and access to information.

### **Effect of external environment on usage of HRIS in the operations of TSC in Kenya**

Effect of external environment was the moderating variable in the study. The study concluded that the organization did not respond to the external environment effectively due to its structure which also delayed decision making. Government support was also significant in usage of HRIS. TSC benchmarked with other organizations and this strongly influenced usage of HRIS. Further, external environment as a moderator reduced the effect of the independent variables.

However, the results of the regression analysis, R square for the predictor internal structure of the organization increased in presence of moderator. In its absence the rest of predictor variables had a more significant effect on the dependent variable. consequently the moderating variable was discarded. It means external environment was not critical to the usage of HRIS in operations of TSC. Also, worth noting is that the regression coefficients, p values for all predictor variables had a positive relationship on usage of HRIS in operations of TSC. Management participation had the greatest significance, followed by infrastructure and finally the internal structure of the organization.

### **5.4 Recommendations.**

In view of the findings as well as the conclusion deduced from the study recommendations that may be useful to policy makers and stakeholders were made.

First, management should commit the required resources for provision of infrastructure for HRIS. This is based on the findings from the study that showed that top management effected usage of HRIS in the operations of TSC. Since TSC relies on funding from the national government, management should liaise with national treasury for allocation of adequate funds to procure and maintain HRIS infrastructure.

It was clear from the studies that the commission had an ICT policy but it should be reviewed to cater for the gaps that were unraveled in the study such as providing relevant and appropriate infrastructure to all counties to increase and ease information sharing amongst them and the TSC headquarters. Management of the TSC and other public organizations should review the decision making structures that seem to forestall innovativeness and flexibility. In addition top management as well as the rest of the staff in the Teachers Service Commission should be trained and sensitized about the HRIS soft ware and its benefits to manage change and create a buy-in. consequently this would enhance usage of HRIS by stemming away apathy from the staff.

All directorates should be interconnected so that Information Communication and Technology directorate is not seen in isolation. Instead it should spearhead the implementation and maintenance of HRIS in all TSC offices in Kenya. TSC staff especially the HRM and IT staff should be provided with opportunities to attend national and regional conferences on HRIS to keep abreast with the latest trends. Moreover even though the findings indicated that TSC bench marks with other

organizations it should strive to be at par with organizations that have digitized their processes better than the public organizations.

### **5.5 Areas of further research**

The study has mainly focused on usage of HRIS in operations of Teachers Service Commission nationwide. It provides a basis for future studies on factors that affect the usage of HRIS in public organizations in Kenya. No studies had been carried out previously in relation to adoption nor usage of information systems in the commission therefore creating future ground of research. The results of the overall model showed that the three predictor variable; management participation, infrastructure and internal structure of the organization combined explained 51.8% of usage of HRIS in the operations of TSC in Kenya. Consequently future research should investigate other factors that affect the usage of HRIS in the operations of TSC in Kenya. From the study involvement of employees in the organization came up as a variable that affected usage of HRIS and this should be subject of future research. From the study whereas management participation and infrastructure were not affected by the moderator; external environment, this was different when it came to internal structure of the organization. This can be a topic of further interrogation in future.

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## **APPENDICES**

### **APPENDIX 1: SPECIMEN LETTER TO RESPONDENTS**

I am a post graduate student at Jomo Kenyatta university of Agriculture and Technology and pursuing a PhD in human resource management. I am carrying out a study on factors affecting the usage of human resource information systems at the Teachers Service Commission, Kenya, as part of my course and have considered you as one of the respondents in the study. The information you will give will not be used for any other purpose other than for academic purposes.



**PART II: EFFECT OF MANAGEMENT PARTICIPATION ON HRIS USAGE**

**1. To what extent do you agree with the following statements? Select a response that best agrees with your position using a tick (√). SA- strongly agree (5), A- Agree (4), UD-**

	<b>Management participation</b>	1	2	3	4	5
a)	Top management at the TSC is actively involved in implementation of HRIS.					
b)	The TSC has official policies and procedures for managing email records.					
c)	HRIS is more of a clerical than top management issue					
d)	HRIS should be confined to ICT department					
e)	Top management assigns enough funds to support HRIS infrastructure.					
f)	HRIS assists managers to make timely decisions					
g)	There is management of HRIS soft ware in the post implementation stage.					
h)	Top management is trained on the use of HRIS					
i)	The head of HRIS sits at the top management meetings					
j)	Information specialists at the commission are well acquainted with the needs of management to produce relevant reports					

**2) How else can top management participate in enhancing the usage of HRIS in the TSC?**

i.....

ii.....

**PART III: EFFECT OF INFRASTRUCTURE ON HRIS USAGE**

**1. To what extent do you agree with the following statements? Select a response that best agrees with your position using a tick (√). SA- strongly agree (5), A-Agree (4), UD- Undecided (3), D-Disagree (2), SA-Strongly disagree (1).**

	<b>Infrastructure</b>	1	2	3	4	5
a)	All staff in the TSC are aware of HRIS at the Commission					
b)	IT facilities in the commission are enough					
c)	The commission has a mainframe facility for the usage of HRIS					
d)	The commission has network file servers and web servers					
e)	There is imaging/document management system					
f)	The TSC has a trusted, statewide, centralized repository for email					
g)	There is adequate networked infrastructure at the TSC to serve ICT needs of the organization.					
h)	There is a system that integrates all employees' information with payroll and financial software.					
i)	Human resource and teacher management functions and processes are conducted electronically.					
j)	There is trained technical staff to support maintenance of HRIS at the TSC					
k)	The TSC does not experience system failures that interfere with HRIS performance					

2) How else in your opinion does infrastructure affect usage of HRIS at the TSC?

.....

**PART IV: EFFECT OF INTERNAL STRUCTURE OF ORGANIZATION**

**HRIS USAGE IN TSC OPERATIONS.**

**1. To what extent do you agree with the following statements? Select a response that best agrees with your position using a tick (√). SA- strongly agree (5), A-Agree (4), UD- Undecided (3), D-Disagree (2), SA-Strongly disagree (1).**

	<b>Internal structure of the organization</b>	1	2	3	4	5
a)	Creativity is emphasized and encouraged at TSC					
b)	TSC strictly operates routinely through formalized structures and processes					
c)	The TSC responds to changes in its environment effectively					
d)	TSC is more devoted to improving efficiency of existing operations than exploring new ideas					
e)	There is inter departmental networking at TSC					
f)	Directors of various departments hold regular meeting					
g)	There is a functional staff welfare at the TSC					
h)	Staff choose their own representatives in the welfare					

**2) How does the TSC organizational structure affect timeliness in decision making?**

.....

**PART V: EFFECT OF EXTERNAL ENVIRONMENT ON HRIS USAGE IN TSC OPERATIONS.**

**1. To what extent do you agree with the following statements? Select a response that best agrees with your position using a tick (√). SA- strongly agree (5), A-Agree (4), UD- Undecided (3), D-Disagree (2), SA-Strongly disagree (1).**

	<b>External environment</b>	1	2	3	4	5
a)	Government support is key to usage of HRIS in TSC					
b)	Usage of HRIS will enhance service delivery at the TSC					
c)	The government has installed infrastructure for usage of HRIS at TSC					
d)	HRM and IT staff get to attend national or regional conferences on HRIS					
e)	Information technology staff has been sensitized about the maintenance of HRIS infrastructure.					
f)	The relationship of the TSC and its customers and other organizations has led to the demand for HRIS.					
g)	Global trends have an influence on adoption of HRIS the TSC's operations.					
h)	The TSC bench marks adoption of HRIS with other institutions within and outside the country.					

2) In your opinion are there other factors outside the TSC that influence usage of HRIS? Yes/ No

If yes which ones?

i.....

ii.....

3). what else should the commission do to enhance the usage of HRIS?

PART IV: HRIS USAGE IN TSC OPERATIONS

**To what extent do you agree with the following statements? Select a response that best agrees with your position using a tick (✓). SA- strongly agree (5), A-Agree (4), UD- Undecided (3), D-Disagree (2), SA-Strongly disagree (1).**

HRIS USAGE	1	2	3	4	5
TSC managers and employees have direct access to HR and other work place services through intranet.					
TSC advertises posts and receives applications on-line					
The TSC has an updated website accessible to staff and clients.					
HRIS is used in preparing the payroll for staff.					
There is a computerized system that holds employee career history, skills and qualifications.					
There is a system that holds staff grade, pay benefits and job description					
Changes in personnel policies and procedures are communicated to employees on- line					
Managers have access to electronic staff records.					
Employees' data on leaves records and absenteeism are monitored electronically and reports generated.					
There are enough computers for use by all staff in carrying out the operations of the TSC.					
Since the adoption of ICT services the no of teachers visiting the TSC has reduced					
ICT services have reduced the number of written correspondences by teachers to the TSC offices.					

- 2) How else has the TSC moved from paper work in its management of employee issues? i.....  
 ii.....

**Appendix 3: Correlation Coefficient Matrix for Effect of Management**

**Participation on HRIS Usage.**

	M.part 1.1	M.part 1.2	M.part 1.4	M.part 1.5	M.part 1.6	M.part 1.7	M.part 1.8	M.part 1.9	M.part 1.10	M.part 1.11
M.part 1.1	1.000	.458	.054	.026	.183	.156	.368	.407	.409	.279
M.part 1.2	.458	1.000	.064	.147	.201	.070	.257	.452	.166	.288
M.part 1.4	.054	.064	1.000	.358	-.055	-.127	-.001	.083	-.204	.025
M.part 1.5	.026	.147	.358	1.000	.266	-.143	.157	.183	.009	.128
M.part 1.6	.183	.201	-.055	.266	1.000	-.112	.440	.263	.183	.303
M.part 1.7	.156	.070	-.127	-.143	-.112	1.000	.201	.038	.320	.110
M.part 1.8	.368	.257	-.001	.157	.440	.201	1.000	.553	.368	.463
M.part 1.9	.407	.452	.083	.183	.263	.038	.553	1.000	.372	.432
M.part 1.10	.409	.166	-.204	.009	.183	.320	.368	.372	1.000	.352
M.part 1.11	.279	.288	.025	.128	.303	.110	.463	.432	.352	1.000

a. Determinant = .092

**Appendix 4: Correlation Coefficient Matrix for Effect of Infrastructure on**

**HRIS Usage**

Factors	Infr1.1	Infr1.2	Infr1.3	Infr1.4	Infr1.5	Inft1.6	Infr1.7	Infr1.8	Infr1.9	Infr1.10
Infrast1.1	1.000	.418	.380	.221	.113	.325	.373	.039	.307	.350
Infrast1.2	.418	1.000	.240	.238	.127	.278	.430	-.002	.244	.256
Infrast1.3	.380	.240	1.000	.620	.382	.443	.077	.246	.377	.155
Infrast1.4	.221	.238	.620	1.000	.501	.305	.104	.241	.327	.138
Infrast1.5	.113	.127	.382	.501	1.000	.363	.136	.442	.519	.214
Infrast1.6	.325	.278	.443	.305	.363	1.000	.354	.311	.376	.164
Infrast1.7	.373	.430	.077	.104	.136	.354	1.000	.193	.350	.216
Infrast1.8	.039	-.002	.246	.241	.442	.311	.193	1.000	.369	.288
Infrast1.9	.307	.244	.377	.327	.519	.376	.350	.369	1.000	.384
Infrast1.10	.350	.256	.155	.138	.214	.164	.216	.288	.384	1.000
Infrast1.11	.285	.376	.199	.270	.248	.079	.300	.081	.332	.138

**Appendix 5: Correlation Coefficient Matrix for Effect of Internal Structure of  
the Organization on HRIS Usage.**

	ISO1.2	ISO1.3	ISO1.4	ISO1.5	ISO1.6	ISO1.7	ISO1.8
ISO1.2	1.000	-.103	.439	.001	.247	.206	.069
ISO1.3	-.103	1.000	.096	.359	.313	.209	.211
ISO1.4	.439	.096	1.000	.167	.366	.362	.171
ISO1.5	.001	.359	.167	1.000	.339	.111	.337
ISO1.6	.247	.313	.366	.339	1.000	.387	.258
ISO1.7	.206	.209	.362	.111	.387	1.000	.367
ISO1.8	.069	.211	.171	.337	.258	.367	1.000
ISO1.9	.099	.177	.072	.490	.279	.308	.765

a. Determinant = .095

**Appendix 6: Correlation Coefficient Matrix for Effect of External Environment  
on HRIS Usage.**

Factors	EEE1.1	EEE1.2	EEE1.3	EEE1.4	EEE1.5	EEE1.6	EEE1.7	EEE1.8
EEE1.1	1.000	.357	.463	.223	.266	.346	.435	.311
EEE1.2	.357	1.000	.133	.053	.113	.406	.402	.091
EEE1.3	.463	.133	1.000	.499	.481	.363	.383	.567
EEE1.4	.223	.053	.499	1.000	.448	.218	.311	.460
EEE1.5	.266	.113	.481	.448	1.000	.236	.283	.530
EEE1.6	.346	.406	.363	.218	.236	1.000	.633	.409
EEE1.7	.435	.402	.383	.311	.283	.633	1.000	.494
EEE1.8	.311	.091	.567	.460	.530	.409	.494	1.000
EEE1.8	.000	.149	.000	.000	.000	.000	.000	

a. Determinant = .067

**Appendix 7: Correlation Coefficient Matrix for HRIS Usage in TSC operations.**

Factors	AoH1 .1	AoH1 .2	AoH1 .3	AoH1 .4	AoH1 .5	AoH1 .6	AoH1 .7	AoH1 .8	AoH1 .9	AoH1.1 10	AoH1. 11	AoH1. 12
AoH1. 1	1.000	.193	.251	.124	.298	.175	.269	.400	.134	.253	.310	.268
AoH1. 2	.193	1.000	.565	.281	.254	.452	.099	.105	.131	-.213	.267	.395
AoH1. 3	.251	.565	1.000	.245	.061	.183	.117	.006	.105	-.133	.219	.354
AoH1. 4	.124	.281	.245	1.000	.138	.248	.151	.005	-.146	-.207	.041	.150
AoH1. 5	.298	.254	.061	.138	1.000	.604	.329	.395	.344	.012	.340	.422
AoH1. 6	.175	.452	.183	.248	.604	1.000	.261	.312	.180	-.104	.133	.276
AoH1. 7	.269	.099	.117	.151	.329	.261	1.000	.460	.198	.214	.262	.313
AoH1. 8	.400	.105	.006	.005	.395	.312	.460	1.000	.241	.198	.239	.306
AoH1. 9	.134	.131	.105	-.146	.344	.180	.198	.241	1.000	.197	.264	.356
AoH1. 10	.253	-.213	-.133	-.207	.012	-.104	.214	.198	.197	1.000	.191	.123
AoH1. 11	.310	.267	.219	.041	.340	.133	.262	.239	.264	.191	1.000	.600
AoH1. 12	.268	.395	.354	.150	.422	.276	.313	.306	.356	.123	.600	1.000

a. Determinant = .030