INFLUENCE OF ICT ON KNOWLEDGE TRANSFER IN PUBLIC SERVICE IN KENYA: A CASE OF MINISTRY OF ICT HEADQUATERS NAIROBI

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ABSTRACT
Kenya lags far behind as far as the application of ICT’s are concerned, and this has impacted on the practice of knowledge management and the benefits such practices may have on governance efficacy and service delivery. Despite this recognition no empirical studies has been done on ICT application on knowledge transfer in public service in Kenya and especially in the Ministry of ICT. The study overall objective of this study is to establish the influence of ICT in knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi. The study specifically aimed to; determine the influence of availability of ICT hardware on knowledge transfer at the Ministry of ICT at the headquarters in Nairobi; establish the influence of ICT software on knowledge transfer at the Ministry of ICT; find out the influence of human resources on knowledge transfer at the Ministry of ICT; assess the influence of ICT procedures on knowledge transfer at the Ministry of ICT and to establish the influence of information on knowledge transfer at the Ministry of ICT. The study adopted a descriptive research design and the target population was a total of 820 staff working at the Ministry of ICT headquarters in Nairobi. The study applied a stratified random sampling technique to select 82 staff as the study respondents. Questionnaires used as the main data collection instruments and a pilot study was conducted to pretest questionnaires for reliability. Descriptive statistics and multiple regression analysis was used to analyze the gathered data and the results were presented on tables, figures and graphs. Findings from the study showed that availability of ICT hardware; ICT software; human resources; ICT procedures and information to a large extent influenced knowledge transfer in Kenya public service, specifically in the Ministry of ICT. The study also concluded that human resources with a coefficient of 0.554 followed by ICT hardware with a coefficient of 0.171, then ICT procedures with a coefficient of 143, then ICT software with a coefficient of 0.117 and lastly information with a coefficient 0.116 affected knowledge transfer in the ministry. The study recommended that the ministry should procure new ICT hardware or upgrade the available ICT hardware. The ministry should improve on data processing devises; data storage devices; memory devises; telecommunication devices and networking devices. The ministry should install up to date ICT software in all the ICT systems .The ministry should train all the staff on ICT knowledge and
skills; recruit ICT professionals; continuously train the employees on ICT to improve their competence and implement effective ICT training programs. The ministry should improve on data management process; ICT systems development process; ICT systems applications process; information retrieval process and job tasks description. The ministry should improve on the type of information stored on ICT systems; ensure improvement on the information quality; implement better information storage methods; ensure easier information sharing and improve on the information accessibility.

Key words: ICT Hardware, ICT Software, Human resource, Information, ICT Procedures

Background to the Study
In recent years the concept of the information society has evolved into that of the knowledge society and the evolution of information management towards knowledge management has led to major social and economic changes globally (Dewah, 2014). A knowledge society is a society that operates within the paradigm of the economics of information. A knowledge society is well connected via modern ICTs to the dematerialized economy, and has access to relevant and usable information. But it values human capital as the prime input to production and innovation (Britz, Lor, Coetzee & Bester, 2006). Many organizations are therefore embracing various ICT based systems in order to facilitate execution of knowledge management processes.

Information communication technology (ICT) plays an important role in knowledge management systems, since it facilitates many of the technology and people-based activities that are important to knowledge management success (Hester, 2012). For knowledge transfer and retention, ICT based systems can improve the efficiency of knowledge transfer by increasing the speed of transfer and decreasing costs due to time and distance. Advances in ICT enable the organization to codify the knowledge base which can then be stored, communicated and retrieved in more convenient ways (McCall, 2008).

Statement of the Problem
In the knowledge age, wealth is based upon the ownership of knowledge and the ability to create and use it to improve goods and services (Wamitu, 2015). With the use of technologies (for example, electronic mail or teleconferencing and so forth), the overall amount of communication in the organizations is increased. Hence, it provides the convenient link among employees within and between divisions (Dewett and Jones, 2001). Advances in ICT enable the organization to codify the knowledge base. The codified knowledge can then be stored, communicated and retrieved in more convenient ways (McCall 2008).

Kenya Public Service has been characterized by ineffective communication (Reson & Lydia, 2012), low productivity resulting in high employee turnover and low employee morale (Wanjau, Muiruri, & Ayodo, 2012). The low productivity could be attributed to low levels of knowledge sharing. Surveys consistently show that 80% of organizations, including public-sector entities, lack a formal knowledge retention strategy (Rodman, Romulus, & Milone, 2013). Public institutes are aware of the potential of tacit knowledge and its management, little or no effort has gone into managing this type of knowledge (Mungai, 2014). Kenya lags far behind as far as the application of ICT’s are concerned, and this has
impacted on the practice of knowledge management and the benefits such practices may have on governance efficacy and service delivery (Ondari-Okemwa & Smith, 2009). Despite this recognition no empirical studies has been done on its application in public service in Kenya and especially in the Ministry of ICT which is highly endowed with ICT infrastructure. There lacks a specific study that have managed to establish the influence of ICT on knowledge transfer in Kenya public service. In an effort to fill the missing knowledge gap in literature. It is in this regard that this study sought to establish the influence of ICT on knowledge transfer in Kenya public service, a case of Ministry of ICT. With a view of suggesting solutions for loss of knowledge.

**General Objective**
The study overall objective was to establish the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi, Kenya

**Specific Objectives**
The study was guided by the following specific objectives:

i) To determine the influence of availability of ICT hardware on knowledge transfer at the Ministry of ICT at the headquarters in Nairobi, Kenya.

ii) To establish the influence of ICT software on knowledge transfer at the Ministry of ICT at the headquarters in Nairobi, Kenya.

iii) To find out the influence of human resources on knowledge transfer at the Ministry of ICT at the headquarters in Nairobi, Kenya.

iv) To assess the influence of ICT procedures on knowledge transfer at the Ministry of ICT at the headquarters in Nairobi, Kenya.

v) To establish the influence of information on knowledge transfer at the Ministry of ICT at the headquarters in Nairobi, Kenya.

**Justification of the Study**
Policy Maker; The research will benefit the public sector and the ministry of ICT in particular in developing knowledge transfer programs towards sustaining their sustaining their knowledge assets thereby preventing knowledge loss.

Government; The study will be of great significance to the ministry of ICT. The study will help the ministry management with key findings on the influence of ICT in knowledge transfer retention in Kenya public service. The better knowledge transfer practices would most probably enable the ministry of ICT and public service in general to acquire and sustain a competitive edge if they adopt the recommendations of the study based on research findings.

The study is of great importance to the government. The research will add value and support government transformation initiatives in enhancing efficiency and productivity within public sector. It will stimulate the regular usage of knowledge of best practices retained in knowledge repositories within public sector.

The findings of this study are expected to be of great significance to various researchers and scholars involved in knowledge management studies. The documented report of this study will be easily acquired from the library and it will equip the learners with more knowledge and skills on the influence of ICT on knowledge transfer in Kenya public service.
Researchers; The study will further make a myriad of contributions to the literature on knowledge transfer which will be part of articles useful by researchers who want to further this study and to other wider stakeholders in the academic circles.

Scope of the Study
The scope of the research study focused on the workforce in the public service in Kenya and in particular in the ministry of ICT headquarters Nairobi. Public service has a variety of knowledge workers in various disciplines who work in various departments and various ministries. Geographically, the study was undertaken at the Ministry of ICT offices situated in Nairobi. The study specifically targeted the employees working in the ministry of ICT head offices three departments notably; department of information and public communications; the information and broadcasting sub-sector department and the communications sub-sector department. The ministry of ICT provided the best platform to this research on knowledge transfer on the precincts of ICT since it is the most considered for endowed with ICT facilities. The study was undertaken within a duration of two months, within the month of August and September.

Limitations of the Study
The study is expected to have limitations that may affect the accuracy and the process of the study findings. However, there was an open the window for further research in this field. Some major limitation that were experienced includes some of the respondents not filling or completing the questionnaires or some issues being misunderstood, inadequate responses to questionnaires and unexpected occurrences like people going on leave before completing the questionnaire. This was mitigated through constant reminder to the respondents during the period they will be having the questionnaire. Descriptive research is flexible in that it requires the tools and administration of tools during the study to remain unchanged throughout data collection. (Mugenda & Mugenda, 2008). The study employed a uniform and consistent data collection procedure and the contents in the questionnaires will not be changed during data collection process.

The organizations confidentiality policy restricted some of the respondents from answering some of the questionnaires since they thought it was against the organization confidentiality policy to expose the organization confidential matters. The researcher presented an introduction letter obtained from the university to the organization management and this helped to avoid suspicion and enable the organization management to disclose much of the information sought by the study.

Literature Review
Technology Acceptance Model (TAM)
This study will be guided by the Technology Acceptance Model (TAM) developed by Davis in 1989. TAM explains and predicts systems use in terms of its two constructs: Perceived Usefulness and Perceived Ease of Use which in turn influence intended use of a technology and the intention then consequently impacts behavior of actual system usage (Dulcic, Pavlic, & Silic, 2012). Perceived usefulness is the degree to which a user thinks a technology would enhance performance or productivity in the workplace. Perceived ease of use is the degree of lack of effort required by the user in adopting a given technology. Perceived ease of use also affects perceived usefulness.
According to Coakes, (2003), the workers who are to use the system, have to perceive the knowledge management system as relevant since it is possible for workers to work without using the system and therefore the system must imply adding value to the work result. If the system is to be accepted, accessibility has to be satisfactory for example who is to be the user, what action the system support, where users get access to the system, when the system is ready to use and how the system’s interface fulfils the goal of the system. According to Omona, Weide, & Lubega, (2010), KM involves implementing changes that may not easily gain acceptance in organizations unless the leadership mobilizes the support of all knowledge users to provide a conducive environment for widespread sharing of knowledge. This is because it nourishes the culture and climate for KM through building of executive support and championing of KM.

**Resource Based Theory**

According to Resource Based Theory resources are inputs into a firm’s production process; can be classified into three categories as; physical capital, human capital and organizational capital (Crook, 2008). A capability is a capacity for a set of resources to perform a stretch task of an activity. Each organization is a collection of unique resources and capabilities that provides the basis for its strategy and the primary source of its returns. In the 21st-century hyper-competitive landscape, a firm is a collection of evolving capabilities that is managed dynamically in pursuit of above-average returns. Thus, differences in firm’s performances across time are driven primarily by their unique resources and capabilities rather than by an industry's structural characteristics (Crook, 2008). Organization resources such as competent and trained staff with knowledge on ICT application makes it easy for an organization to effectively develop and use ICT systems that helps in knowledge retention and transfer. On the other hand organization resources such as enough funds help organization to acquire better ICT facilities such as ICT hardware and software that helps in knowledge transfer.
Independent Variables

**ICT hardware**
- Data processing devices
- Data storage devices
- Memory devices
- Telecommunication devices
- Networking devices

**ICT Software**
- Application software
- Platform software
- Computer programs
- Networking software
- Databases

**Human resources**
- ICT knowledge and skills
- ICT professionals
- Employees’ competence
- Employees training
- Experience

**ICT Procedures**
- Data management process
- ICT systems development process
- ICT systems applications process
- Information retrieval process
- Job tasks description

**Information**
- Type of information
- Information quality
- Information storage
- Information sharing
- Information accessibility

**Knowledge Transfer**
- Knowledge creation
- Knowledge sharing
- Knowledge application

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Conceptual Framework
Methodology

Research Design
The study adopted a descriptive research design. According to Kombo and Tromp (2006), descriptive studies are non experimental in that they deal with the relationships between non manipulated variables in a natural rather than laboratory setting. Since the events or conditions have already occurred, the researcher selects the relevant variables for an analysis of their relationships. Descriptive studies use the logical methods of inductive-deductive reasoning to arrive at generalizations, descriptive studies employ methods of randomization so that error may be estimated when inferring population characteristics from observations of samples and in descriptive research, the variables and procedures are described Cooper and Schindler, (2003). The study considered this design appropriate since it facilitated application of a stratified random sampling technique to obtain information from few respondents in order to establish the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi.

Target Population
Target population defines those units for which the findings of the survey are meant to generalize (Mugenda & Mugenda, 2008). The target population comprised a total of 820 staff working at the Ministry of ICT headquarters in Nairobi. The staffs that were targeted in the ministry three key departments were 250 staff from department of information and public communications; 330 staff from the Information and Broadcasting Sub-sector department and 240 staff from the Communications sub-sector department. The list of the staff was sourced from the Ministry of ICT headquarters in Nairobi human resource management department. The Ministry of Information Communications and Technology is mandated to regulate the Information Communication sector with the mission is to develop Kenya as a globally competitive and prosperous nation by creating an enabling environment that encourages and enhances the development, expansion and use of Information Communications Technologies (ICTs) (Government Gazette 23377, Notice 538, 3 May 2007). The ministry of ICT like many other public civil organizations has embraced ICT as a strategy to achieve its mission but it has not yet been established the extent to which the ICT has influenced knowledge transfer in the organization. The study therefore considered the ministry of ICT since data gathered from the ministry can be generalized to reflect the influence of ICT on knowledge transfer in other organizations in Kenya public service.

Population

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Target population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of information and public communications</td>
<td>250</td>
</tr>
<tr>
<td>The Information and Broadcasting Sub-sector</td>
<td>330</td>
</tr>
<tr>
<td>The Communications sub-sector</td>
<td>240</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>820</strong></td>
</tr>
</tbody>
</table>

Sample and Sampling technique
This study applied a stratified random sampling technique. Stratified random sampling is whereby the population is divided into segments and thereafter subjects are drawn in proportion to their original numbers in the population (Bougie & Sekaran, 2010). According to Orodho (2009) stratified random sampling is considered
appropriate since it gives all respondents an equal chance of being selected and thus it has no bias and eases generalization of the findings. The target population was divided into three sub-groups/strata based on the three ministry departments notably; department of information and public communications; the Information and Broadcasting Sub-sector department and the Communications sub-sector department. The criteria for stratification will be the number of employees in the three ministry departments. Simple random sampling will then be applied to select 10% of the respondents from each population subgroup/strata leading to a total of 82 respondents as the sample size for the study. According to Orodho (2009) a sample size of between 10% per cent of the target population supports gathering of unbiased data from the target population and assists in generalization of the research findings. The sample size of the study was thus being 82 respondents as shown in table below.

### Sample Size

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Target population</th>
<th>Sample Ratio</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of information and public communications</td>
<td>250</td>
<td>10%</td>
<td>25</td>
</tr>
<tr>
<td>The Information and Broadcasting Sub-sector</td>
<td>330</td>
<td>10%</td>
<td>33</td>
</tr>
<tr>
<td>The Communications sub-sector</td>
<td>240</td>
<td>10%</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>820</td>
<td>10%</td>
<td>82</td>
</tr>
</tbody>
</table>

### Data Collection Method

Data collection is the process of gathering respondents’ opinions on the study problem (Kothari, 2003). Primary data was gathered through the use of a semi structured questionnaire (open and close ended questions) (Cooper & Schindler, 2003). Questionnaires were the main data collection instruments. Open ended and close-ended questionnaires were used. Questionnaires were preferred since according to Dempsey (2003) they are effective data collection instruments that allow respondents to give much of their opinions pertaining the researched problem. According to Sekeran (2003) the information obtained from questionnaires is free from bias and researchers influence and thus accurate and valid data was gathered. Secondary data was obtained through desk research and e-resources from past published scholarly articles on small scale suppliers’ performance. The questionnaires were self-administered to a total of 90 respondents and later picked for data analysis and tabulated through the use graphs, charts and reports.

### Pilot Study

The aim of pilot study is to test the validity and reliability of the questionnaires. According to Sekeran (2003), a pilot test is necessary for testing the reliability of data collection instruments. Joppe (2000) explains reliability of research as determining whether the research instruments truly measures what it was intended to measure or how truthful the research results are. Pilot study is thus conducted to detect weakness in design and instrumentation and to provide proxy data for selection of a sample (Cooper & Schindler, 2003). The pilot test involved selecting 5% of the target population. The data obtained was subjected to Cronbach’s alpha tool for measuring
data reliability.

Validity of Data Collection Instruments
Data validity refers to the degree to which the results represent the phenomenon under study and therefore the results are accurate, meaningful and free from interference (Mugenda, 2008). To establish the validity of the data collection instruments, the research instruments were given to various staff, i.e. 5% of the population. The staff was expected to tick the relevance of questionnaires in gathering data on the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT. The content of the responses given by the staff was checked against the study objectives and rated using a scale of 1 (very relevant) to 4 (not very relevant). The Content Validity Index was used to determine the validity by adding up all the items rated using a scale of 3 and 4 by the staff and dividing the total sum by the total number of items in the questionnaires. The coefficient of the data gathered from the pilot study was computed with assistance of Statistical Package for Social Sciences (SPSS). A context of validity coefficient index of above 0.75 implied that the questionnaires are valid research instrument for the study (Joppe, 2000).

Reliability of Data Collection Instruments
Reliability refers to the consistence, stability, or dependability of the data. Whenever a researcher measures a variable, researcher wants to be sure that the measurement provides dependable and consistent results (Cooper & Schindler, 2003). A reliable measurement is one that if repeated a second time will give the same results as it did the first time. Cronbach's alpha a coefficient of reliability that gives an unbiased estimate of data generalizability was used to test reliability of the answered questionnaires. According to Zinbarg (2005), Cronbach's alpha is a coefficient of reliability that gives an unbiased estimate of data generalizability. An alpha coefficient higher than 0.75 indicates that the gathered data has a relatively high internal consistency and could be generalized to reflect opinions of all suppliers’ respondents in the target population. After obtaining an alpha coefficient of higher than 0.75, questionnaires were issued to all respondents. Data reliability played an important role towards generalization of the gathered data on the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT.

Data Analysis and Presentation
Once administering of questionnaires is completed, the data collected was systematically organized through coding to facilitate analysis. Quantitative methods of data analysis were employed with both descriptive and inferential statistics being applied to explain the results of the study. Descriptive statistics was preferred because it aids the study to meaningfully describe the population of study; descriptive statistics was used to compute data frequency, percentage, percentage mean and STD deviation results aided by Statistical Packages for Social Science (SPSS Version 23). SPSS was considered appropriate since it is user friendly and allows the researcher to follow clear set of quantitative data analysis procedures that lead to increased data validity and reliability and demonstrates the relationship between the research variables. SPSS also assisted in cross tabulation and recording of data frequencies. Qualitative data was analyzed thematically along the study objectives. The quantitative findings of the study were presented using tables and charts whereas the qualitative findings were presented thematically in narrative forms. Further inferential statistics was applied using multiple regression model to establish the relationship between the research
variables. The findings were presented using tables and charts. The following multiple regression model was applied: \[ Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon. \]

Where:
- \( Y \) = Knowledge transfer
- \( \beta_0 \) = Constant
- \( X_1 \) = ICT hardware
- \( X_2 \) = computer software
- \( X_3 \) = human resources
- \( X_4 \) = procedures
- \( X_5 \) = information
- \( \epsilon \) = error term

**Results**

**Response Rate**

The study conducted an analysis of response rate to determine the actual number of the respondents who answered and submitted back the questionnaires for data analysis. From the results in table below, the response rate was (64) 78% of the total sample size and the non-response rate was (18) 22%. The response rate of 78% was accepted since it helped in gathering sufficient data that was generalized to reflect the opinions of respondents on the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi.

According to Kombo and Tromp (2006) a response rate that exceed 30% of the total sample size of the study is deemed acceptable in gathering of sufficient data that could be generalized to represent the opinions of all respondents in the target population when the research design is descriptive. The response rate of 78% was as result of use of self-administered questionnaires and pre-notification of the study respondents on the study intention, in addition of making follow up calls to clarify queries as well as to prompt the respondents to fill the questionnaires.

<table>
<thead>
<tr>
<th>Response Rate</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>64</td>
<td>78%</td>
</tr>
<tr>
<td>Non Response</td>
<td>18</td>
<td>22%</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Pilot Study Test Results**

The study conducted a pilot study to test the validity and reliability of the questionnaires which were the main data collection instruments. According to Sekeran (2003), a pilot study is necessary for testing the reliability of data collection instruments. Joppe (2000) explains reliability of research as determining whether the research truly measures that which it is intended to measure or how truthful the research results are. The pilot study respondents involved 13 (10%) of the target population. According to Kombo and Tromp (2006) 5% of the sample population is a good representative to test the validity from the whole population. This ensures to determine if the instruments are important in obtaining the required data from the field and make valid conclusions.

**Validity of the Instrument**

To establish the validity of the data collection instruments, the research instruments were given to 13 respondents. The respondents were expected to tick if the item in the questionnaires could be used to establish the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi. The Content Validity Index of 1 (not relevant) to 5 (very relevant) was used to determine the validity by adding up all the items rated using a scale of 1 and 5 by...
the selected project management professionals and dividing the total sum by the total number of items in the questionnaires. The coefficient of the data gathered from the pilot study was then computed with assistance of Statistical Package for Social Sciences (SPSS). An average content validity index of 5 was obtained and this implied that the questionnaires were valid research instrument for the study (Joppe, 2000).

Reliability of the Instrument
To measure the reliability of the data collection instruments an internal consistency technique using Cronbach's alpha was applied using SPSS. Cronbach's alpha is a coefficient of reliability that gives an unbiased estimate of data generalizability (Zinbarg, 2005). As presented in table 4.2 all the study variables had an Alpha coefficient of above 0.75 and this satisfied Zinbarg (2005) that an alpha coefficient of 0.75 or higher indicates that the gathered data is reliable as it has a relatively high internal consistency and can be generalized to reflect opinions of all respondents in the target population. This thus implied that the data collection instruments were reliable in gathering sufficient data that can be generalized to establish the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi.

<table>
<thead>
<tr>
<th>Reliability Results</th>
<th>Items</th>
<th>Cronbach's Alpha Values</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Transfer</td>
<td>8</td>
<td>.9100</td>
<td>Accepted</td>
</tr>
<tr>
<td>ICT hardware</td>
<td>8</td>
<td>.8246</td>
<td>Accepted</td>
</tr>
<tr>
<td>ICT software</td>
<td>8</td>
<td>.8508</td>
<td>Accepted</td>
</tr>
<tr>
<td>Human resources</td>
<td>8</td>
<td>.8523</td>
<td>Accepted</td>
</tr>
<tr>
<td>ICT procedures</td>
<td>8</td>
<td>.8097</td>
<td>Accepted</td>
</tr>
<tr>
<td>Information</td>
<td>8</td>
<td>.8097</td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Demographic Data
This section presents the results of respondents’ personal information

Age of the Respondents
The study aimed to establish the age of the respondents in order to determine if the age corresponded with their working experience in Kenya public service. This was important since it helped in determining how respondents had experienced the influence of ICT on knowledge transfer in Kenya public service. Figure 4.1 presents that majority (53%) of the respondents were in the age category of 31-40 years, followed by 22% who were in the age category of 41-50 years, then 16% who were in the age category of 18-30 years and lastly 9% of the respondents who were in the age category of 51 years and over.
Age of the Respondents

Respondents Education Level
The study aimed to establish the highest education level held by the study respondents in order to establish if they were equipped with relevant knowledge and skills on the influence of ICT on knowledge transfer in Kenya public service. From the study findings as presented in figure below; majority (50%) of the respondents had university education level, followed by (25%) of the respondents with college education level, then 16% of the respondents had post graduate education level and only 9% of the respondents had secondary education level. This demonstrated that most of the respondents were qualified to have the required knowledge and skills in understanding the influence of ICT on knowledge transfer in Kenya public service.

Education Level

Respondents Working Experience
The study further found out it was important to establish the respondents working experience in order to determine if their experience could be relied upon to make conclusions for the study, based on their working experience in the influence of ICT
on knowledge transfer in Kenya public service. As can be observed in Figure below, majority (42%) of the respondents had a working experience of 9-12 years, 28% had a working experience of 4-8 years, 16% of the respondents had a working experience of 13-18 years, 8% of the respondents had a working experience of 19 years and above and finally 6% of the respondents had a working experience of less than 3 years. These findings were in tandem with findings by Kombo and Tromp (2006) who found out that respondent with a high working experience assist in providing reliable data on the problem in hand since they have past experience on the study problem.

![Work Experience Chart](chart.png)

**Working Experience**

**Regression Analysis**

Further inferential statistics was applied using multiple regression model to establish the relationship between the research variables. The following multiple regression model was applied: \( Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon \). Where: \( Y \) = Knowledge transfer and retention \( \beta_0 \) = Constant; \( X_1 \) = ICT hardware; \( X_2 \) = computer software; \( X_3 \) = people; \( X_4 \) = procedures; \( X_5 \) = information and \( \epsilon \) = error term. Regression analysis is a statistics process of estimating the relationship between variables. Regression analysis helps in generating equation that describes the statistics relationship between one or more predictor variables and the response variable (Green & Salkind, 2003). The regression analysis results were presented using regression model summary table, Analysis of Variance (ANOVA) table and beta coefficients table. The relationships between the dependent variable and independent variables, and the results of testing significance of the model were respectively interpreted. In interpreting the results of multiple regression analysis, the three major elements considered were: the coefficient of multiple determinations, the standard error of estimate and the regression coefficients. R squared was used to check how well the model fitted the data. R squared is the proportion of variation in the dependent
variable explained by the regression model. These elements and the results of multiple regression analysis were presented and interpreted below.

From the findings of the study, the regression model in table below, coefficient of determination (R²) was 0.751 and R was 0.867 at 0.05 significance level. This is an indication that the five independent variables notably; X₁ = ICT hardware; X₂ = computer software; X₃ = people; X₄ = procedures and X₅ = information significantly influence the dependent variables (Y) which was knowledge transfer. The coefficient of determination (R², 0.751) indicates that 75.1% of the variation on knowledge transfer is determined by, ICT hardware; computer software; = people; procedures and information. The remaining 25.9% of the variation on knowledge transfer is determined by other variables not included in the study model. This shows that the model has a good fit since the value is above 75%. This concurred with Graham (2002) that (R²) is always between 0 and 100%; 0% indicates that the model explains none of the variability of the response data around its mean and 100% indicates that the model explains all the variability of the response data around its mean. In general, the higher the (R²) the better the model fits the data.

<table>
<thead>
<tr>
<th>Regression Model Summary</th>
<th>Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>R</td>
</tr>
<tr>
<td>1</td>
<td>0.867(a)</td>
</tr>
</tbody>
</table>

The study further used one way Analysis of Variance (ANOVA) in order to test the significance of the overall regression model. Green & Salkind (2003) posits that one way Analysis of Variance helps in determining the significant relationship between the research variables. Table 4.10 indicates that the high value of F (22.973) with significant level of p-value 0.00 which is less than 5% level of significance is enough to conclude that all the independent variables significantly influenced knowledge transfer in the organization. This implies goodness of fit of the model and thus the variables can be carried on for further analysis to determine with significance the level of influence of each variable.

**Analysis of Variance (ANOVA)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>9.154</td>
<td>5</td>
<td>1.831</td>
<td>22.973</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>3.028</td>
<td>38</td>
<td>.080</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Total</td>
<td>12.182</td>
<td>43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table below further presents the results of the test of beta coefficients which shows the extent to which each independent variable influenced knowledge transfer. As presented in table 4.10, (X₁) ICT hardware coefficient of 0.281 was found to be positive at significant level of 0.001 and this indicates that ICT hardware positively influenced knowledge transfer in the organization. (X₂) computer software Coefficient of 0.098 was found to be positive at significant level of 0.005 and this indicates that computer software positively influenced knowledge transfer in the organization. (X₃) people coefficient of 0.767 was found to be positive at significant level of 0.000 and this indicates that people positively influenced knowledge transfer in the organization.
(X₄) procedures coefficient of 0.349 was found to be positive at significant level of 0.000 and this indicates that procedures positively influenced knowledge transfer in the organization. (X₄) information coefficient of 0.349 was found to be positive at significant level of 0.000 and this indicates that information res positively influenced knowledge transfer in the organization. This clearly demonstrates that all the independent variables significantly influence knowledge transfer in the organization and thus the regression equation was: \( Y = 0.025 + 0.554X₁ + 0.171X₂ + 0.143X₃ + 0.117X₄ + 0.116X₅ \)

<table>
<thead>
<tr>
<th>Coefficients</th>
<th>Unstandardized Coefficients</th>
<th>B</th>
<th>Std. Error</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td></td>
<td>.125</td>
<td>.262</td>
<td>1.096</td>
<td>.001</td>
</tr>
<tr>
<td>X₁</td>
<td></td>
<td>.171</td>
<td>.114</td>
<td>1.152</td>
<td>.005</td>
</tr>
<tr>
<td>X₂</td>
<td></td>
<td>.117</td>
<td>.179</td>
<td>.656</td>
<td>.011</td>
</tr>
<tr>
<td>X₃</td>
<td></td>
<td>.554</td>
<td>.168</td>
<td>3.290</td>
<td>.000</td>
</tr>
<tr>
<td>X₄</td>
<td></td>
<td>.143</td>
<td>.093</td>
<td>.463</td>
<td>.000</td>
</tr>
<tr>
<td>X₅</td>
<td></td>
<td>.116</td>
<td>.179</td>
<td>.636</td>
<td>.011</td>
</tr>
</tbody>
</table>

Summary of the Findings
The study overall objective will be to establish the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi. Findings from the study showed that availability of ICT hardware; ICT software; human resources; ICT procedures and information to a large extent influenced knowledge transfer in Kenya public service, specifically in the Ministry of ICT.

ICT Hardware
The study found out that ICT hardware influenced knowledge transfer at the Ministry of ICT at the headquarters. The study found out that majority of the respondents indicated that all the ICT hardware factors to a large extent influenced knowledge transfer at the Ministry of ICT at the headquarters in Nairobi. The ICT hardware factors included; data processing devises; data storage devices; memory devises; telecommunication devices and networking devices.

ICT Software
The study established that ICT software influenced knowledge transfer at the Ministry of ICT. The study findings showed that majority of the respondents indicated that all the ICT software factors to a large extent influenced knowledge transfer at the Ministry of ICT at the headquarters in Nairobi. The ICT software factors included; application software; platform software; ICT programs; networking software and databases systems. The means, standard deviation and variance results were used to make inferences.

Human resources
Findings from the study showed that human resources influenced knowledge transfer at the Ministry of ICT. The study found out that human resource factors notably; ICT knowledge and skills; ICT professionals; employees’ competence; employees training
and experience. The means, standard deviation and variance results were used to make inferences to a large extent influenced knowledge transfer in the ministry. On average all the people factors had an average. These findings thus indicated that majority of the respondents indicated that ICT knowledge and skills; ICT professionals; employees’ competence; employees training and experience determines how people in an organization influence how knowledge is transferred in an organization.

ICT Procedures
The study identified that ICT procedures influenced knowledge transfer at the Ministry of ICT. The study found out that majority of the respondents indicated that the ICT procedures factors notably; data management process; ICT systems development process; ICT systems applications process; information retrieval process and job tasks description to a large extent influence knowledge transfer in the organization with average.

Information
The study further established that information to large extent influenced knowledge transfer at the Ministry of ICT. The information factors included; type of information; information quality; information storage; information sharing and information accessibility. The study findings implied that majority of the respondents indicated that information factors notably; type of information; information quality; information storage; information sharing and information accessibility to a large extent influence knowledge transfer in the organization with an average.

Knowledge Transfer
The study finally determined that knowledge transfer at the Ministry of ICT was determined by Knowledge creation; Knowledge sharing and Knowledge application to a large extent influence knowledge transfer in the organization with an average.

Conclusions
Based on the study findings, the study drew conclusions that availability of ICT hard ware; computer software; human resources; ICT procedures and information to a large extent influenced knowledge transfer in Kenya public service, specifically in the Ministry of ICT. The regression model coefficient of determination indicated that the variation on knowledge transfer is determined by, ICT hardware; ICT software; human resource; ICT procedures and information.

Recommendations
The study suggested the following recommendations as a measure to improve on knowledge transfer in the ministry of ICT.

ICT Hardware
To ensure that the available ICT hardware influence knowledge transfer at the Ministry. The ministry should procure new ICT hardware or upgrade the available ICT hardware. The ministry should improve on data processing devices; data storage devices; memory devices; telecommunication devices and networking devices.
ICT Software
The ministry should install up to date ICT software in all they ICT systems and continuously train staff on how to use the software’s. The ministry should upgrade on acquire new application software; platform software; ICT programs; networking software and databases systems.

Human Resources
To ensure that people within the organization participates positively in knowledge transfer. The ministry should train all the staff on ICT knowledge and skills; recruit ICT professionals; continuously train the employees ‘on ICT to improve their competence and implement effective ICT training programs.

ICT Procedures
The ministry should improve on the procedures to ensure ICT influences knowledge transfer at the Ministry of ICT. The ministry should improve on data management process; ICT systems development process; ICT systems applications process; information retrieval process and job tasks description

Information
Finally to ensure that information to large extent influences knowledge transfer at the Ministry of ICT. The ministry should improve on the type of information stored on ICT systems; ensure improve on the information quality; implement better information storage methods; ensure easier information sharing and improve on the information accessibility.

Areas for Further Research
The study established the influence of ICT on knowledge transfer in Kenya public service, specifically in the Ministry of ICT at the headquarters, Nairobi. The study therefore suggests further studies to be carried out in other ministries and other organizations in order to establish the influence of ICT in knowledge transfer. Further studies should also be carried out to determine other factors that affect knowledge retention and knowledge transfer in other organizations.

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Foremost, I would like to express my sincere gratitude to my supervisor Dr. Wario Guyo for the continuous support of my research study, for his patience, motivation, and immense knowledge. His guidance helped me in all the time of research and writing of this thesis. I could not have gotten a better advisor and mentor for my research study. I am also thankful to JKUAT lecturers whose encouragement, guidance and support from the initial to the final level enabled me to develop an understanding of the research study.

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