Factors Influencing Adoption of Mobile Technologies in Public Service Delivery: A Survey of Kajiado North Sub-County

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***Abstract*-** This study examined the factors contributing to adoption of mobile technologies in public service delivery in Kajiado North sub-county. The independent variables were performance expectation, effort expectancy, social influence and facilitating conditions in line the Unified Theory of Acceptance and use of technology. Simple random sampling based on sample frame of all heads and deputy heads of government departments based in the sub-county was used. The main instrument for the study were self-constructed questionnaire. Data was organized, edited, analyzed and interpreted using descriptive and inferential statistics with the help of Statistical Package for Social Science (SPSS) version 2.0. The data was categorized, themes established, coded, entered into the computer and analyzed. The results were presented in graphs, tables and charts to present frequencies and percentages. The study findings showed that the four independent variables that were studied, explained only 60.1% of the adoption of mobile technologies as shown by the R2 thus the other variables that were not covered in this study scope accounts for 39.9% of the variation in adoption of mobile technologies. The study findings also showed that the all the variables had a positively significant impact on the adoption of mobile technologies in Kajiado North Sub-County. The study recommended that the county government should empower their employees through trainings on how to use mobile technologies in delivering services to the public. The study also recommended that further studies should be conducted to establish other challenges (38.9%) influencing the adoption of mobile technologies in public service delivery especially in other counties.

***Index Terms*-** performance expectation, effort expectancy, social influence, Public Service Delivery

I. INTRODUCTION

Information technology in todays office place has expanded dramatically. Some estimates indicate that since the 1980's about 50% of all new capital investments in organisations have been in information technology (Venkatesh, Morris, Davis, & Davis, 2003). With growing computerization and increasing internet connectivity, the world has presently reached a stage where more and more users are motivated to modifying their ways of doing things in order to leverage the advantages provided by information communications technologies. In the case of citizens, it holds the promise of enhanced access to information and government agencies, improved service delivery and transparency in dealings and interactions with government (Danida, 2012).

According to Mofleh (2008), it has been well established in theory and practice that an effective and efficient government contributes to good governance and, by extension, development. Efficiency, effectiveness and public service delivery in government mean that processes, people, structures, institutions and actors produce results that meet specific targets while making the best use of existing resources. Today, these targets include, among other things, the adoption of an enterprise approach, scaling operations, establishing monitoring and performance evaluation systems, engaging citizens, providing timely results, research and development, competition, change management systems, divestment, sharing services across agencies and organizations, reducing costs, clear reporting systems, establishing smaller teams, improving the quality of public service and less bureaucracy (Grindle, 2007).

Recent discussions on government efficiency, effectiveness and public service delivery recognize the advantages of using ICTs in public entities (Kumar & Best, 2006). This is referred to as electronic government or e-Government. Today, many nations round the world are working to increase openness and transparency. Information technology is widely viewed as a cost-effective and convinient way to achieve efficient service delivery and reduce corruption (Kumar & Best, 2006).

Kenya has not been spared this agony, and many policy documents have been developed to find ways to address the problems of low levels of service delivery to the majority of citizens. According to Kumar and Best (2006), electronic government is an idea first raised by former U.S. vice president-Al Gore, within his vision of linking the citizen to the various agencies of government for getting all kinds of government services in an automated and automatic way, in addition to the completion of the government working itself depending on information and communication networks to reduce costs, improve performance, speed of delivery and effectiveness of implementation.

The researchers analyze the factors influencing adoption of mobile technologies in public service delivery with special emphasis on Kajiado North sub-county. With the recent devolution in Kenya which has also been termed as the most ambitious form of devolution in the world in the words of President Barrack Obama, the overall state of governance will be determined by the efforts put

in place by individual counties. The research will study factors influencing adoption of mobile based IT among individual government officials working in Kajiado sub-county. It will be worthwhile to note that different individuals react differently to information technology. The success of information technology as a driver of efficiency in public service delivery will depend on how well the officials embrace it.

Wamoto (2015) posited that there is significant pressure from citizens in the Kenya environment for quicker services from government hence pressuring the government to improve service delivery by adopting and implementing e-government services. Kajiado North sub-county is quite vast and the road network is not properly developed. Because of this limitation, physical access to government service may prove slow and expensive and hence defeating the very purpose of devolution. For this reason it is important for government to implement mobile-based technology solutions so as to be able to reach the greatest number of people and avail an efficient mechanism for accessing services.

The problem of access to service due to poor infrastructure in Kajiado north sub-county has not been fully resolved by the decentralization programme christened huduma centers simply because there is only one such center in the entire Kajiado county. Business people and other citizens are adversely affected by the long distances they have to travel to receive even the simplest form of government services. According to GOK (2014), the ICT sector in Kenya grew at an average of nearly 20 per cent annually from 1999 to 2013. Internet usage rates for 2013 were around five for every ten adults. Person-to-person mobile money transactions at the end of 2010 were equivalent to around 20 per cent of the GDP with two of every three Kenyan adults being users. ICT has been one of the main drivers of Kenya's economic growth over the last decade.

It is therefore evident that ICTs use among the citizen will increase in the future ther is no doubt that mobile based technologies will be the fastest and most efficient channel for public and private service delivery. This fact has not been truly reflected in Kajiado north sub-county. The 2013 statistics show that the ICTs forward and backward linkages have continued to improve at a national scale, with employment opportunities hitting over 150,000. For instance, there were 103,165 mobile money agents by June 2013. The rise in the number of agents indicates increased access of mobile money transfer services as well as creation of employment opportunities in ICT. It would be desirable to provide more services through mobile phone-based Technologies so that more people can access such services. The study sought to identify the factors influencing the adoption of mobile phone-based ICTs in delivery of public service to the residents of Kajiado north sub-county. The results of this study were important for policy makers so that they can understand how well public services can be delivered through the mobile phone in the days to come.

The general objective of this study was to determine the factors influencing adoption of mobile technologies in public service delivery in Kajiado north sub-county. The specific objectives of this study were to determine the contribution of performance expectancy in adoption of mobile-based technologies in Kajiado North sub-county, to examine the role of effort expectancy in adoption of mobile-based technologies in Kajiado North sub-county, to establish the role of social influence in adoption of mobile-based technologies Kajiado North sub-county and to determine the contribution of facilitating conditions in adoption of mobile-based technologies Kajiado North sub-county

II. LITERATURE REVIEW

2.1 Theoretical framework

This section reviews the past studies on the field governance and mobile technologies and measures that have been found important in evaluating ICTs. The aspects of efficiency in public service delivery through mobile technologies discussed in this section include Performance expectancy, effort expectancy, social influence, and facilitating conditions in adoption mobile –based technologies (MBTs) in provision of public services.

This study found some relevant theories and models which best explain the relationship that exists between the independent variables and the dependent variable. These theories and models are the Diffusion of innovation theory and the unified Theory of and acceptance and use of technology (UTAUT).

2.1.1 Diffusion of Innovations Theory

One theory which attempts to understand the reasons why some people adopt new ideas more rapidly than others is the theory of diffusion of innovations. An innovation is an idea, behavior or object that is perceived as new by its audience (Rogers, 2003). According to Rogers (2003), the reasons why certain innovations spread more quickly than others is because of relative advantage, compatibility to existing values, simplicity and ease of use, trial ability and finally observable results. These are the qualities of an innovation which determine the rate at which such an innovation or idea will be accepted by users. Rogers postulates that these qualities account for 47-87% of the variation in adoption of new ideas. In this theory, re-invention is a key principle. This means that developers are always expecting users to provide new feedback and insights on how to develop the idea and make it better.

Relative advantage is described as the degree to which an innovation is perceived as better than the idea it supersedes by a particular group of users, measured in terms that matter to those users, like economic advantage, social prestige, convenience, or satisfaction. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is likely to be (Rogers, 2003). There are no absolute rules for what constitutes "relative advantage". It depends on the particular perceptions and needs of the user group. This quality is equivalent to what other theories term as performance expectancy (PE).

Compatibility with existing values and practices is the degree to which an innovation is perceived as being consistent with the values held as important by a group of people.. An idea that is incompatible with their values, norms or practices will not be adopted as rapidly as an innovation that is compatible. Another quality which is shared by the diffusion theory and other theories is Simplicity

and ease of use which is the degree to which an innovation is perceived as difficult to understand and use. According to Rogers (2003), new ideas that are simpler to understand are adopted more rapidly than innovations that require the adopter to develop new skills and understandings. This quality is also commonly referred to as Ease of Use in the other theories. Another quality of an idea as postulated by the Diffusion theory is trialability which is the degree to which an innovation can be experimented with on a limited basis. An innovation that is trialable represents less risk to the individual who is considering it for example in our case we might want to term Facebook and Twitter as trialable technologies because these applications come in-built with a majority of standard cell phones.

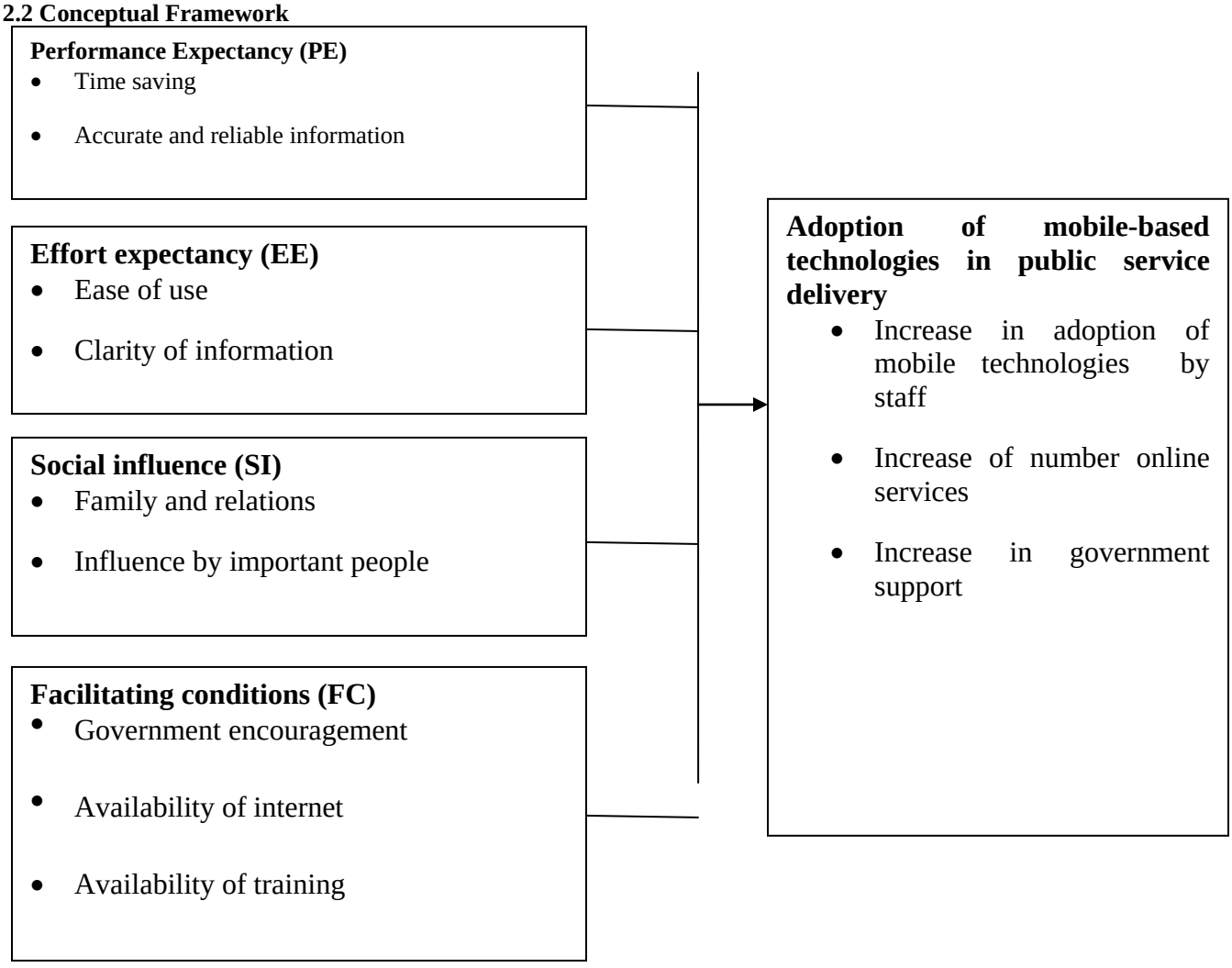
2.1.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

This research project used the Unified Theory of Acceptance and Use of Technology (UTAUT) as a theoretical basis to conduct empirical research testing the factors that influence use of mobile technologies in the process of delivering public service in Kajiado North sub-county. Venkatesh et al. (2003) combined eight user acceptance and motivation models to propose the Unified Theory of Acceptance and Use of Technology. The eight theories are the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model (MM), the Theory of Planned Behaviour (TPB), a combined theory of Planned Behaviour/Technology Acceptance Model (C-TPB-TAM), the Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT).

According to Venkatesh et al. (2003), UTAUT is comprised of a range of factors which are taken into consideration when evaluating the Behavioral intention to use and the level of acceptance of a particular technology or system. Derived from this, UTAUT suggests that four core factors are direct determinants of technology acceptance (behavioral intention) and use (behavior): These factors are made up of four different constructs used in measuring user acceptance and user behaviour and these include

The theory also introduces several intervening variables which we will not focus on in this study. UTAUT will be used with modifications in consideration of the unique requirements of the Kajiado-North case. The validation of UTAUT in the originating paper (Venkatesh et al., 2003) showed that UTAUT explains 70% of the variation in usage intention (acceptance) of technology which is greater than each of the eight previous models and their extensions.

2.2 Conceptual Framework



Independent variables **Dependent variable**

Figure 2.1: Conceptual Framework

2.3 Empirical Review relevant to the study

Unlike many developed countries, a majority of the developing countries have very low levels of access to internet connection especially among the rural poor. Enough research has been done in the area of ICTs by researchers and analysts from all parts of the world. One area where a majority of them concur is that adoption of ICT approaches in governance comes with a multiplicity of benefits to governments, businesses and the citizens. Some of the benefits which accrue from the adoption of mobile based technologies (MBTs) in government improved efficiency of administrative processes, increased transparency by way of easy access to information by all, improved services delivery by eliminating queue and unnecessary waiting, decreased corruption, contribution to revenue growth and cost reductions especially in tax payments and collections.

Several studies have been conducted by various scholars to try and understand factors influencing adoption of technologies. Researchers who adopted the UTAUT model either use the same constructs proposed by Venkatesh et al. (2003) to make changes to the constructs to suit their respective context Suhonen (2015). In their study conducted in Uganda, Engotoit, Moya, Kituyi and Abima (2016) established a significant positive relationship between the independent variables of Performance Expectancy, Effort Expectancy, Social Influence and the dependent variable Behavioral Intentions to use as well as Behavioral intentions to use and adoption of MBTs which is also a dependent variable. The study further found a confirmatory significant positive relationship between Performance expectancy and Behavioral intentions to use, Effort Expectancy and Behavioral Intentions to use, Social Influence and Behavioral intentions to use and finally behavioral intentions to use and the adoption of MBTs.

According to Prensky (2001) in his study posits that young people today are all ‘native speakers’ of the digital language of computers. The youth frequently adopt new instructional technologies in learning and constructing knowledge. The transmission of general information through use of mobile technologies is more and more frequent today among young people who constitute the largest portion of our population. The young people spend considerable amounts of time and money staying connected with their friends through their mobile phones. It is hence more likely than not that they would prefer to be able to access government service and many other available services through the convenience of their phones.

Currently, approximately 90% of handset sales worldwide are for devices powered by Googles's Android and apple's iOS mobile operating systems (Charles, 2013). These devices are what are commonly referred to as Smart phones and they come with a host of amazing capabilities. For this reason, majority of phone users are expected to be able to access internet and other mobile based technologies. The United Nations through the Department of Economic and Social Affairs (UNDESA) has been in the frontline in advocating for integration of ICTs into government service delivery and as a result, UNDESA has been publishing E-government surveys every two years since 2003. The UN body has been ranking the nations using an index known as EGDI (E-government development index) which is computed based on a nations achievement or score in relation to three components namely: human capital, Telecommunication Infrastructure Index (TII) and Online Service Index (OSI).

This means that a nation’s score is measured on three important dimensions namely: the availability of online services, telecommunication infrastructure and human capacity. The EGDI scores are categorized into Low - (below 0.25), Middle -between (0.25-0.5), High (0.5-0.75) and Very high (above 0.75). According to the EGDI survey of 2014, Kenya, Ethiopia, Sudan, Uganda and a majority of Sub-Saharan nations were ranked as Middle EGDI nations. The very high EGDI category was occupied largely by developed OECD nations like USA, Japan, South Korea and Singapore among others. In the Low EGDI category lies nations like Mozambique, South Sudan, Congo, and Afghanistan.

It is on this premise that devolution and a commitment to make service delivery available to the largest number of people is founded. According to the (KNBS, 2015) the Government of Kenya has identified Information and Communication Technology (ICT) as a key enabler to the attainment of the goals and aspirations of the Vision 2030. The thrust of the vision with regard to the ICT sector is to transform Kenya into a knowledgeable and information based economy by enabling access to quality, affordable and reliable ICT services in the country. The benefits associated with the use of modern technology in service delivery have given ICT prominence in the eyes of the public and decision makers. With the use of modern technology, communication has become more reliable, faster and affordable. The Government has also undertaken various measures aimed at developing the ICT sector. Some of the efforts put in place include the national broadband strategy as well as the facilitation of the migration from analogue to digital platform.

2.4 Critique of existing Literature

According to Suhonen et.al (2015), findings of studies that have employed UTAUT vary according to diverse context of study and the Information Technology system under study. For example one study on Educational Technology, adopted UTAUT model to estimate the driving factors that influence user acceptance of web base question-answer system (WBQAS) in China. The study revealed that Performance Expectancy, Facilitating Conditions and Effort Expectancy were significant predictors of the Behaviour intention (BI) to use the system. On the contrary, Social Influence had no significant impact on the BI to use WBQAS. In a related study, Marchewka, Liu,and Kostiwa (2007) found EE and SI to be significant in predicting use behaviour in a study conducted in US towards describing students’ perceptions of using course management software application. Also, Cheng et al. (2007) while investigating whether the differences in gender, age and occupation for m-learning influences the use of mobile device found out that SI has positive effect on BI to use m-learning with females having the higher influencing index.

Rogers (2003) in his book Diffusion of innovations postulates that the five qualities of innovation namely; relative advantage, compatibility with values, simplicity and ease of use, trial ability and observable results are the only determinants of the speed at which innovations can diffuse in a population. He goes further to mention that these qualities account for 48-87% of the variation in the adoption of new ideas and technologies. This argument fails to address critical contributing factors such as social influence and facilitating conditions.

In addition, most of the studies conducted with an attempt to study technology acceptance have largely been done on students in academic settings. For these reasons, the researcher finds it more appropriate to make use of the UTUAT model to better study the relationship which exists between the independent and dependent variables.

Kenya is in the infancy of devolution and a new constitutional dispensation. Technology is seen as the key to success in service delivery efficiency. As counties rush towards embracing top-notch technologies, Kajiado North sub-county will have no much choice but to follow suit. Mombasa and Nairobi counties have led the way in developing mobile based solutions for service delivery.

This research sought to identify the factors that influence adoption of mobile-based technologies (MBTs) in Kajiado-North sub-county with the view of availing the requisite information to the policy makers and other interested parties. No similar study has been carried out in this administrative area on a cross-departmental scope and hence this study will provide a basis upon which further research can be carried out.

III. RESEARCH METHODOLGY

This study used a descriptive design. The major purpose of a descriptive research study is to describe a state of affairs as it exists at present. According to Copper and Schindler (2006), the main feature of descriptive research is that the researcher has no control over the variables; he/she can only report what has happened or what is happening. In this case, we attempted to examine the concerned people's opinion and feelings towards adoption of mobile technologies in public service delivery in Kajiado North sub-county.

In this study the researcher described 'what exists' with respect to the stated variables. The researcher will have no control over these variables. In descriptive design, the problem is structured and well understood (Ghauri & Gronhaug, 2010). Descriptive research portrays an accurate profile of persons, events or situations (Robson, 2002). This method is preferred because it will give a report of things as they are. Additionally, high reliability is easy to obtain by presenting all subjects with a standardized stimulus which ensures that observer subjectivity is greatly eliminated (Mugenda & Mugenda, 2008).

According to Cooper and Schindler (2006), a population is the total collection of elements about which we wish to make some inferences. In this study, the population was all 65 senior government officials comprising of county executives, heads of departments and their deputies working for both county and national government in Kajiado north sub-county. These people are considered appropriate for this study because they are the ones that are in-charge of the various departments in the sub-county and are expected to be at the fore front in ensuring improved service delivery in-line with the government commitment to Vision 2030 goals.

According to Mugenda (2008) sampling is the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected. She also recommended that a 10% to 30% sampling from every group of the population will give a more representation of the whole population. The researcher used a simple random sampling technique to select a sample from the population. For a design to be called random sampling or probability sampling, it is imperative that each element in the population has an equal and independent chance of selection in the sample (Kumar, 2011).

Table: 3.1: Population of study

Level	Population
Head of departments	25
Deputy head of departments	25
Administrators	15
Total	65

According to Mugenda (2008) sampling is the process of selecting a number of individuals for a study in such a way that the individuals selected represent the large group from which they were selected. She also recommended that a 10% to 30% sampling from every group of the population will give a more representation of the whole population.

The study employed simple random sampling to select the sample for the research. This involved sampling from the list of all county executives, heads and deputy heads of government departments in Kajiado North sub-county. This is as per the sampling frame provided by the county human resource department. The sample was selected with a significance level of 5% using the following formula.

$n = N / 1 + N (c)^2$

Where:

n = sample size

N =population size

C = confidence interval, expressed as decimal (.1)

$$n = \frac{65}{1+65\,(.1)^2} = 40$$

The researcher used questionnaires in collecting the primary data. A questionnaire consists of a set of well formulated questions to probe and obtain response from respondents and collect all the data items which are required for testing hypothesis and other tests relating to various research issues. Self-administered questionnaires were used because they encourage consistency in asking questions and it is easy to analyze the yielded data (Bhattacherjee, 2012). Questionnaires were structured with background questions and study variable questions adopted from the UTAUT model with modification which was used to collect data on the factors influencing the adoption of Mobile-based technologies (MBTs) in public service delivery in Kajiado North sub-county. Adequate time was given for the respondent to answer questions adequately. The questionnaires were hand delivered to the 40 respondents and collected after they are filled.

Before the actual research, the researcher conducted a pilot testing on randomly selected heads of departments from the sub-county. The results of the pilot test were used to test for face validity, content validity and construct validity of the instruments. This also determined the reliability of the research instrument. It was used to determine the ease of use of the instruments, to detect any weakness like ambiguous statements, to determine whether the respondents can understand the questions, language, any errors or flaws. This helped the researcher to take corrective measures in order to make improvements where required. The purpose of the pilot study was to test the validity of research instruments as well as to check the presence of ambiguity and researcher's bias (Ghauri & Gronhaug, 2010). The pilot study also assessed the feasibility of the study, based on the locale and the nature of the sample. It also helped to identify the ambiguity of items in the instruments. The feedback helped to improve the research instruments.

Validity is the degree to which a test measures what it purports to measure (Copper & Schindler, 2006). They define validity as the accuracy and meaningfulness of the inferences which are based on the research results. It is the degree to which results obtained from the analysis of the data actually represents the phenomena under study. The scholars contend that the validity of the questionnaire data depends on the crucial way the ability and willingness of the respondents to provide the required information. The scholars also state that the usual procedure in establishing the validity of a measure is for example, to use professionals and experts in the particular field. The researcher established the validity of the research instrument from the pilot study and opinions of experts from Kajiado North sub-county.

Mugenda (2008), defines reliability as the consistently and dependability of data collected through repeated use of a scientific instrument or data collection procedure under the same conditions. The researcher used the Cronbach's Alpha in measuring the reliability of the instrument of the study.

$$R = k/k - 1\left(1 - \sum \sigma_1^{\,2} / \sigma y^2\right)$$

Where;

K = Total number of items in the list,

σ_1 = Variance of individual items

σy^2 = Variance of total test scores

The researcher first obtained an introduction letter addressed to the Kajiado North Sub-county administrator from the University Department of Human Resource Development once the research proposal is approved. Primary data was collected through the questionnaire to assist in answering the research questions. A questionnaire was used to collect data from the respondents and it will have both close-ended and open- ended. The close-ended questions assisted in limiting responses in some cases while the open-ended questions allowed the subjects some degree of freedom to provide information in their own words. Likert scale was also used with an aim of weighing factors according to their importance as perceived by the respondents in relation to the variables. The choice of the questionnaire is based on the view that it is easy to administer and the data is easy to analyze (Mugenda & Mugenda, 2003)

Data was gathered by use of structured open and closed ended questionnaire. The respondents were briefly introduced to the purpose of the study before administering the questionnaires. The researcher explained to the respondents the nature and importance of the study during pilot and actual study. Confidentiality was assured to the respondents whereby this was stated in a letter that accompanied each questionnaire. Secondary data was obtained from books and journals.

To ascertain the correlation coefficient between the independent variables and dependent variable, data was analyzed qualitatively and quantitatively to address research objectives. This was done using statistical results package for social science (SPSS) as a tool. Descriptive statistics were used to present the results, which will be tabulated in frequency distributions, percentages and graphs. For inferential statistics, the study employed multiple regression analysis to establish the existing relationships between the independent variables (performance expectation, effort expectation, social influence and facilitating conditions) and the independent variable -adoption of mobile technologies. Regression analysis was used to determine the type or relationship between the variables. This assisted in determining the level of influence the independent variables on the dependent variable. The following model was employed.

$$Y = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+ \beta_4X_4+\varepsilon$$

Where:

Y = Adoption of mobile technologies

β_0 = Constant Term

$\beta_1, \beta_2, \beta_3$ = Beta coefficients

X_1 = Performance expectation

X_2 = Effort expectation

X_3 = Social influence

X_4 = facilitating conditions

ε = Error

IV. FINDINGS, SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND AREAS OF RESEARCH

4.1 Findings on Background Information

4.1.1 Response Rate

The study targeted 40 respondents in the collection of data about the factors influencing adoption of mobile technologies in public service deliver in Kajiado North sub-county. In the study all the respondents involved participated in filling out the study thus the response rate was 100%.

4.1.2 Reliability and Validity

Reliability is the extent to which a measuring instrument contains variable errors that appear inconsistently from observation during any one measurement attempt or that vary each time a given unit is measured by the same instrument. Construct validity can be ascertained by relating measuring instruments to a general theoretical framework so as to determine if the instrument is related to the concepts and theoretical assumptions they are using (Nachmias & Nacmias, 2008). SPSS version 22 was used to analyze the relationship that exists between the dependent variable and the four independent variables shown in the diagram below. A Cronbach's alpha test was done. Most of the values had a high Crownbach alpha value (above 0.7) which indicated that the instrument was sufficiently suitable for use in the measurement. Thus the construct validity of the data collection instrument was reasonable (Brown, 2000).

Table 4.1: Alpha Coefficients

Variable/Construct Description	Item mean values	Item standard deviations	Coefficient Alpha Reliability
Performance Expectancy	3.75	.500	0.836
Effort Expectancy	3.75	.500	0.839
Social Influence	3.25	.957	0.765
Facilitating Conditions	1.50	.577	0.944
Performance Expectancy	3.75	.500	0.836

4.1.3 Gender of the respondents

Most of the respondents (52%, n=21) were male whereas 48% (n=19) were female.

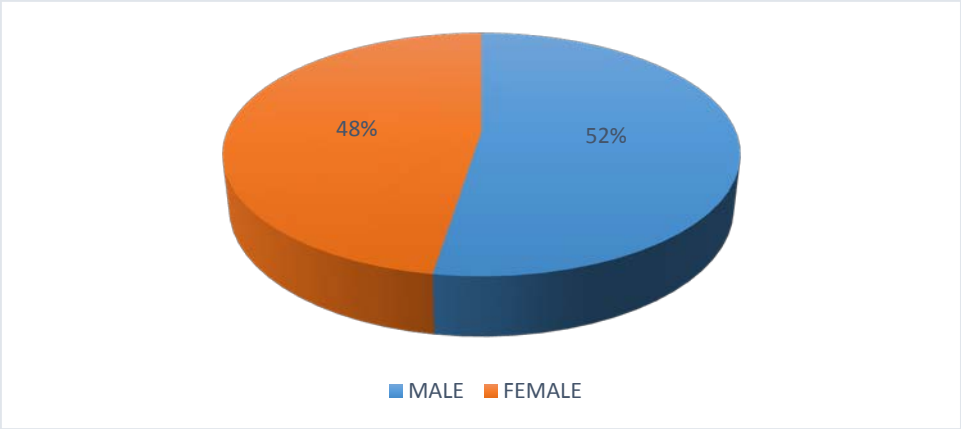


Figure 4.1: Gender of the respondents

4.1.4 Age of the respondents

Most of the respondents (42%) were in the age category of 26-35 years, 30% were in the age category of 36-50 years, 18% were in the age category of 18-25 years whereas 10% were above 50 years of age.

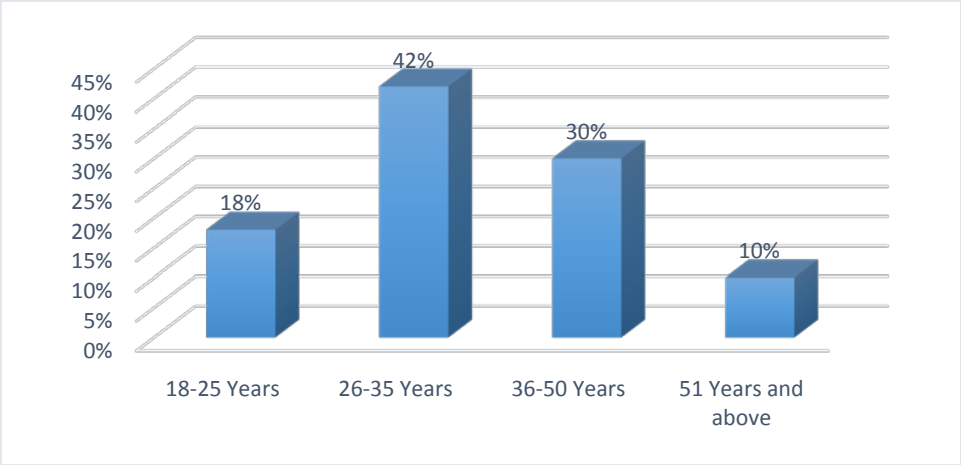


Figure 4.1: Age of the respondents

4.1.5 Highest education level

The study wanted to assess the highest level of education that the respondents had attained. The study findings revealed that 50% of the respondents had a diploma, 37.5% of the respondents had a degree, 7.5% of the respondents had a certificate whereas 5% of the respondents had a master's degree.

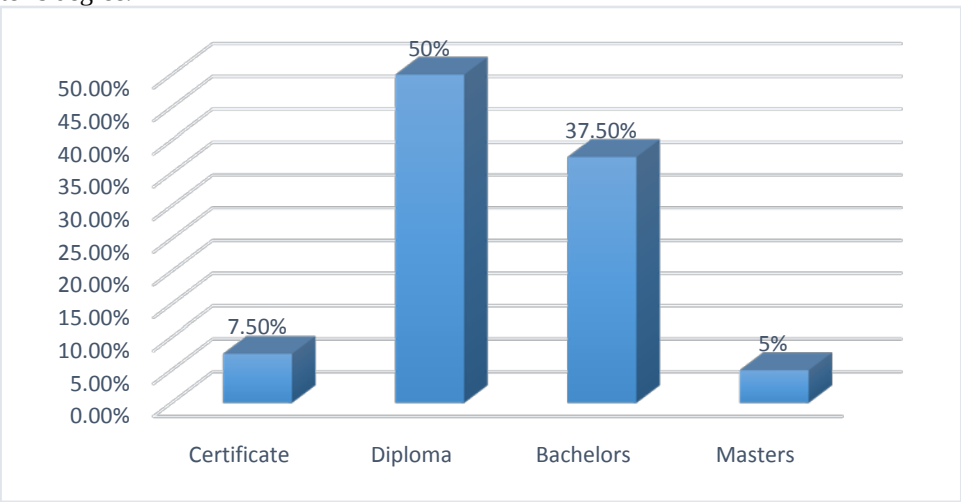


Figure 4.2: Highest education level

4.1.6 Length of working experience

The study sought to find out the length of working experience among the respondents. The study findings indicated that 37.5% of the respondents had worked for 5-10 years, 27.5% of the respondents had worked for 3-5 years, 17.5% of the respondents had worked for over ten years, 12.5% of the respondents had worked for 5-10 years whereas 5% of the respondents had worked for less than a year.

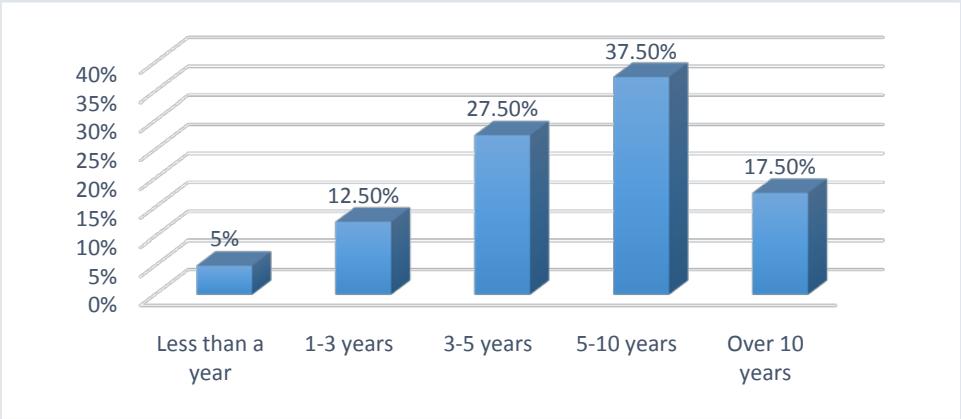


Figure 4. 3: Length of working experience

4.2 Findings on Specific Objectives

4.2.1 Application of mobile-technologies in the organization

4.2.1.1 Familiarity with mobile technologies

The study sought to find out which mobile technologies the respondents were familiar with. The study findings revealed that all the respondents were familiar with Short Messaging Services (SMS), 97.5% of the respondents were familiar with Whatsapp, 82.5% of the respondents were familiar with Facebook, 72.5% of the respondents were familiar with Instagram, 47.5% of the respondents were familiar with Twitter whereas 7.5% of the respondents were familiar with other mobile technologies like Snapchat, Messenger and Uber.

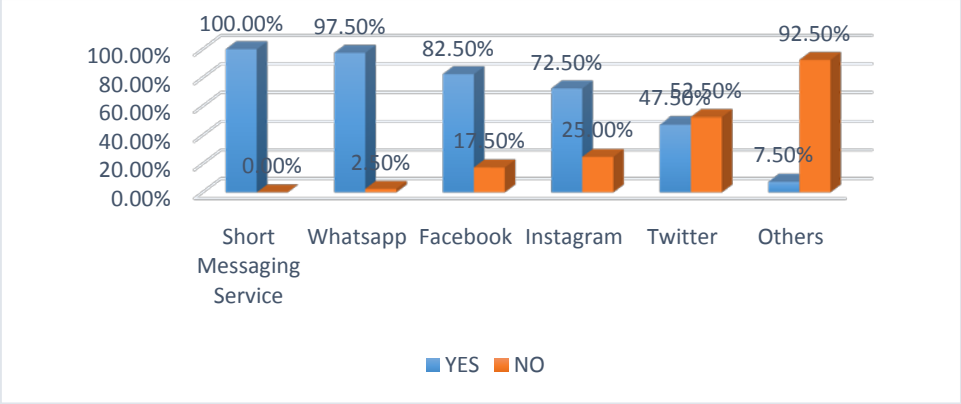


Figure 4.4: Mobile Technologies Familiar with

4.2.1.2 Have official mobile phone to execute duties

The study showed that most of the respondents (80%) had an official phone to execute their daily duties.

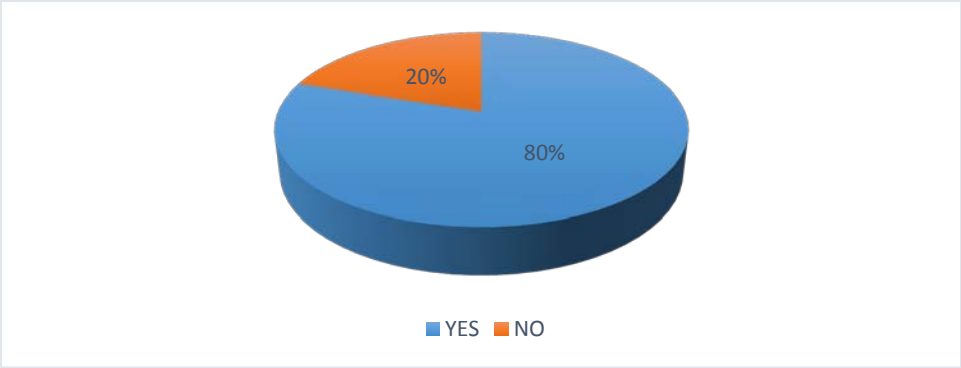


Figure 4.5: Possession of official phone to execute duties

The study also sought out to find out if the official mobile phone was a smart phone. 97% of the respondents stated that the official phone they had was a smart phone.

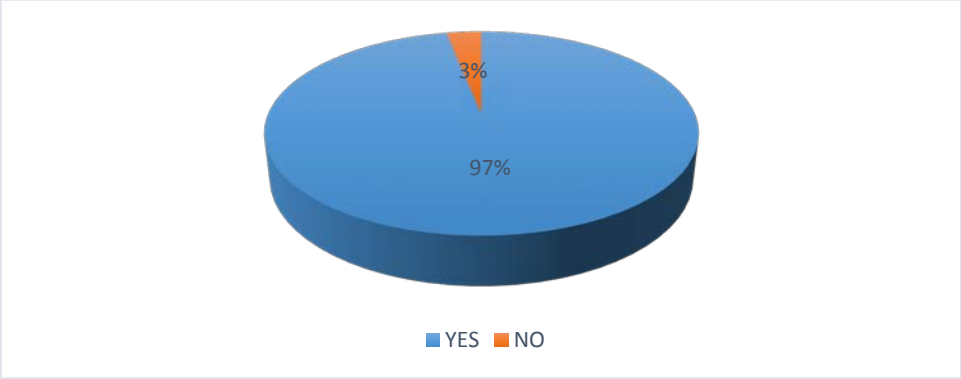


Figure 4.6: Official phone is smart phone

4.2.1.3 Official uses for phone

The study sought to find out the official uses of the phones that the employees had. The study found out that 72.5% of the respondents used their mobile phones to communicate to colleagues on SMS to pass information, 62.5% of the respondents used their mobile phones to send and receiving instant messages on Whatsapp, 60% of the respondents used their mobile phones to send and receiving important photos on Whatsapp, 50% used their mobile phones to send and receive emails, 47.5% of the respondents used their mobile phones to receive and pass information to the public whereas 45% of the respondents used their phones to received queries and complains from the public.

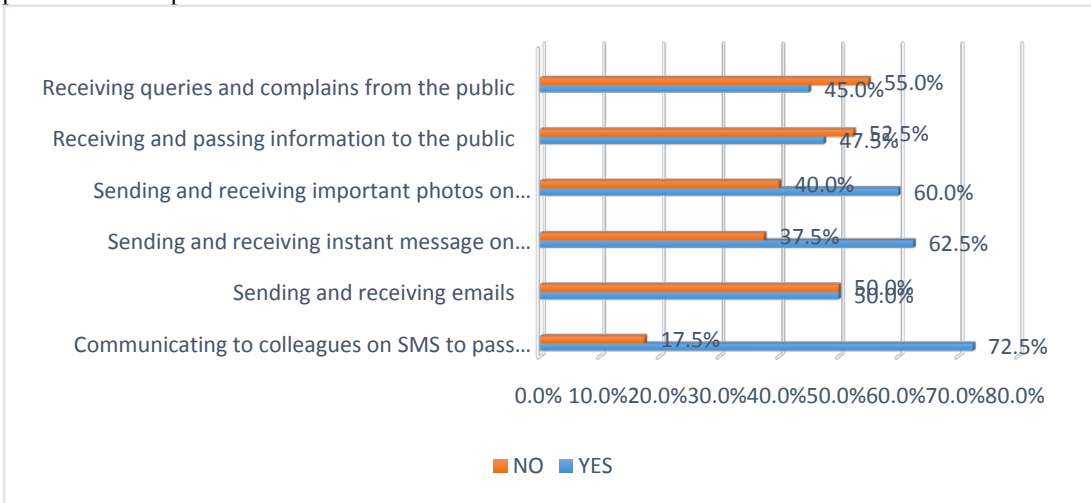


Figure 4. 7: Official uses for phone

4.2.2 Performance Expectancy

4.2.2.1 Impact on speed, accuracy and reliability of services by use of mobile technologies

97% of the respondents agreed that the services in the department would be faster, more accurate and reliable if the public could access the service through mobile technologies like SMS.

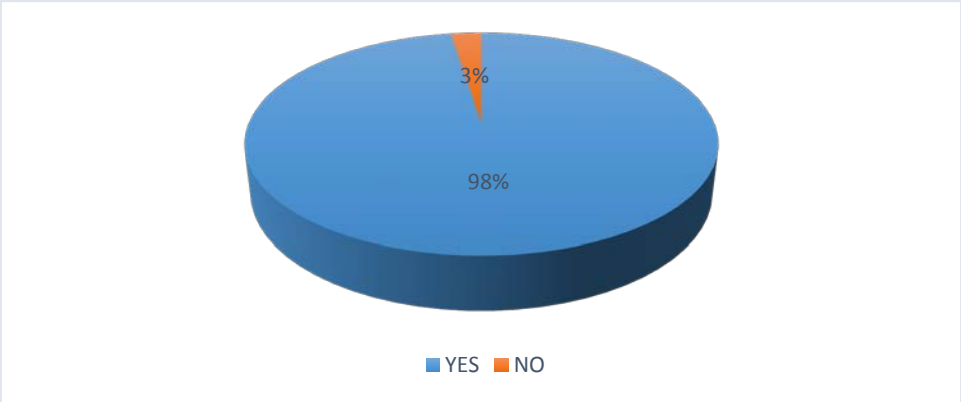


Figure 4.8: speed, accuracy and reliability of services by use of mobile technologies

4.2.2.2 Indicators of performance expectancy

The first objective of the study was to determine the contribution of performance expectancy in adoption of mobile-based technologies in Kajiado North sub-county. The respondents were served with questions and statements that were targeted to answering this research question. The mean values in the tables were interpreted using the following range, 0-1.0 – Strongly disagree, 1.1-2.0 – Disagree, 2.1-3.0 – Moderately disagree, 3.1-4.0 – Agree and 4.1-5.0 – Strongly agree. The standard deviation was used to determine the closenes of the data to the mean nad thus the accuracy of the mean. A standard deviation that was less than 1.5 was considered to be an indication that the values were closer to the mean. The findings of the study are discussed in the sections below as they were presented in the questionnaire.

The study results revealed that the respondents strongly agreed that; mobile phone technologies like Whatsapp and SMS are expected to ease service delivery if put to good use by government officials as shown by a mean of 4.68 and a standard deviation of 0.526 which is a small deviation, indicating that most of the values were near the mean. The study findings also revealed that a majority of the respondents strongly agreed that services offered via mobile technologies are normally accurate and reliable, as shown by a mean of 4.1 and a standard deviation of 1.08 which is small meaning that data had values was close to the mean.

The study findings also showed that most of the respondents strongly agreed that a majority members of the public have mobile phones and passing information to & from is easy through mobile technologies like SMS and Whatsapp, as shown by a mean of 4.18 and a standard deviation of 0.90 which is small meaning that data had values was close to the mean.

According to the study findings, most of the respondents agreed that services offered online come with clear user instructions to enable ease of use and this is shown with a mean of 3.55 and a standard deviation of 1.19 which is a small value meaning that it was close to the mean.

Table 4. 2: Indicators of performance expectancy

Statement	Strongly disagree	Disagree	Moderately agree	Agree	Strongly Agree	Mean	Std Dev.
Mobile phone technologies are expected to ease service delivery if put to good use by government officials	0	0	2.5	27.5	70	4.68	0.526
Services offered via mobile technologies are normally accurate and reliable	2.5	5.0	22.5	20	50	4.1	1.08
Most members of the public have mobile phones and passing information to & from is easy through mobile technologies	0	5.0	17.5	32.5	45	4.18	0.90
Services offered online come with clear user instructions to enable	2.5	20	27.5	20	30	3.55	1.19

ease of use							

4.2.3 Effort Expectancy

4.2.3.1 Ease and helpfulness of mobile technologies in accessing services

Regarding whether most citizens would find it easier to use mobile technologies most of the respondents (92%) stated that they would find it easier.

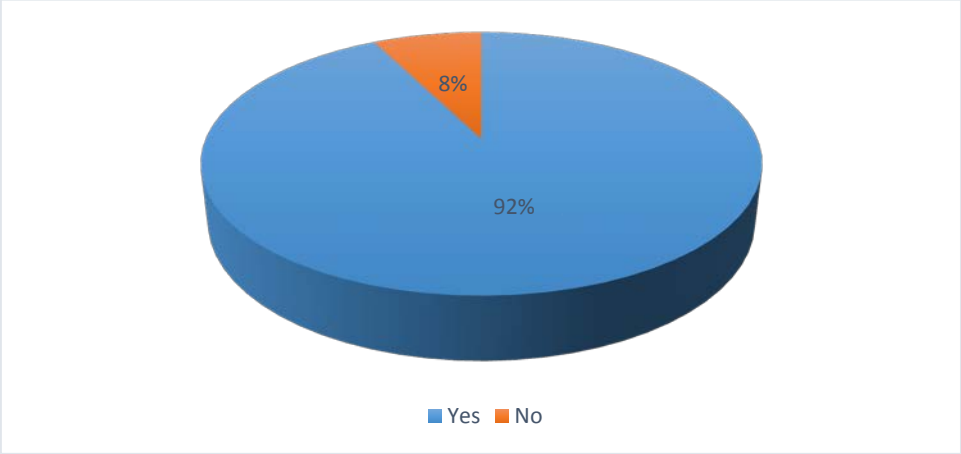


Figure 4.8: Ease and helpfulness of mobile technologies in accessing services

4.2.3.2 Effort Expectancy Indicators

The second objective of the study was to examine the role of effort expectancy in adoption of mobile-based technologies in Kajiado North sub-county. The study sought to investigate the extent to which respondents agreed with the role of effort expectancy in adoption of mobile-based technologies in Kajiado North sub-county. The mean values in the tables were interpreted using the following range, 0-1.0 – Strongly disagree, 1.1-2.0 – Disagree, 2.1-3.0 – Moderately disagree, 3.1-4.0 – Agree and 4.1-5.0 – Strongly agree. The standard deviation was used to determine the closenes of the data to the mean nad thus the accuracy of the mean. A standard deviation that was less than 1.5 was considered to be an indication that the values were closer to the mean.

The study findings showed that most of the respondents strongly agreed that the use of mobile technologies has become a very common means of providing essential services both in the public, as shown by a mean of 4.75 and a standard deviation of 0.494 which is small meaning that the data had values that were closer to the mean.

The study findings also showed that most of the respondents strongly agreed that most people can use mobile technologies like SMS and Whatsapp with ease as shown by a mean value of 4.0 with a standard deviation of 0.934 which is small thus it shows that most of the values were closer to the mean values. As per the study findings most of the respondents agreed that many citizens access the Internet via mobile networks as indicated by a mean 0f 3.33 and a standard deviation of 1.289 which is small thus indicated that most of the data values were close to the mean.

The study findings also revealed that most of the respondents strongly agreed that mobile technologies like SMS and WhatsApp are considered by many to be faster, easier and cheaper to use as shown by a mean of 4.08 and a standard deviation of 0.89 which is small thus indicating that most of the data values were close to the mean.

Table 4. 3: Effort Expectancy Indicators

Statement	Strongly disagree	Disagree	Moderately agree	Agree	Strongly Agree	Mean	Std Dev.
Use of mobile technologies has become common means of providing essential services both in the public and private sectors	0	0	2.5	20	77.5	4.75	0.494
Most people use mobile technologies like SMS and Whatsapp with ease	0	10	12.5	45	32.5	4.00	0.934
Many citizens access the Internet via mobile networks	7.5	22.5	25	20	25	3.33	1.289
Mobile technologies like	0	7.5	12.5	45	35	4.08	0.89

SMS and WhatsApp are considered by many to be faster, easier and cheaper to use							

4.2.3.3 Services that can be offered via mobile phones

In regard to the services that can be offered via mobile phones the respondents stated the following services: payments of services and bill request (25%), alerts (25%), status updates on various things (12.5%), getting reports (10%), all services (5%), cash disbursements to the elderly (2.5%), field data collection (2.5%) and advertisements (2.5%). A small number of the respondents (10%) stated that they would not recommend any services to be offered via mobile phones.

Table 4.4: Services that can be offered via mobile phones

		Frequency	Percent
Valid	ADVERTISEMENTS	1	2.5
	ALERTS ON THINGS LIKE : SEMINARS AND NEW PROGRAMS, COMMUNITY POLICING, LIVESTOCK DISEASE OUTBREAKS, HEALTH EDUCATION, BEST PRACTICES	10	25.0
	ALL SERVICES	2	5.0
	CASH DISBURSEMENT TO THE ELDERLY	1	2.5
	FIELD DATA COLLECTION	1	2.5
	GETTING REPORTS E.G. ON WATER LEAKS, HEALTH RECORDS , EMERGENCIES, BUILDING REGULATIONS	4	10.0
	NONE	6	15.0
	PAYMENT OF SERVICES AND BILL REQUESTS	10	25.0
	STATUS UPDATE ON JOBS AND TENDER PREQUALIFICATION	5	12.5
	Total	40	100.0

4.2.4 Social Influence

4.2.4.1 Awareness of a department that uses mobile technology for delivering service to the public

All the respondents (100%) knew a department that uses mobile technology to deliver services to the public.

4.2.4.2 Social influence indicators

The research sought to establish the role of social influence in adoption of mobile-based technologies Kajiado North sub-county. The respondents were asked to respond to some statements and questions regarding social influence indicators. The mean values in the tables were interpreted using the following range, 0-1.0 – Strongly disagree, 1.1-2.0 – Disagree, 2.1-3.0 – Moderately disagree, 3.1-4.0 – Agree and 4.1-5.0 – Strongly agree. The standard deviation was used to determine the closenes of the data to the mean nad thus the accuracy of the mean. A standard deviation that was less than 1.5 was considered to be an indication that the values were closer to the mean.

As per the study findings most of the respondents agreed that they had started using mobile technologies when they realized most of their colleagues were using them, as shown by a mean of 3.90 and a standard deviation of 1.47 which is small and it indicated that most of the data values were closer to the mean.

The study findings showed that most of the respondents strongly agreed that departments using mobile technologies for service delivery are more efficient than those that do not, as depicted by a mean of 4.23 and a standard deviation of 0.891 which is small and shows that most of the data values were closer to the mean.

As per the study findings most of the respondents strongy agreed that most people learn about mobile technologies from relatives and friends, as shown by a mean of 4.68 and a standard deviation of 0.944 which is small thus indicating that the a majority of the data values are close to the mean value.

According to the study findings most of the respondents disagreed that the organization offers training via workshops to educate people on how to access various services on the online platform, as shown by a mean value of 1.95 and a standard deviation of 1.36 which is small thus shows that most of the data values were closer to the mean values.

Table 4. 5: Social influence indicators

Statement	Strongly disagree	Disagree	Moderately agree	Agree	Strongly Agree	Mean	Std Dev.
Started using mobile technologies when I realized most of my	17.5	2.5	12.5	7.5	60	3.90	1.47

colleagues were using them							
Departments using mobile technologies for service delivery are more efficient than those that do not	0	5.0	15.0	32.5	47.5	4.23	0.891
Most people learn about mobile technologies from relatives and friends	5.0	0	2.5	7.5	85	4.68	0.944
Organization offers training via workshops to educate people on how to access various services on the online platform	55	22.5	5.0	7.5	10	1.95	1.36

4.2.4.3 Facilitating conditions

The research sought to determine the contribution of facilitating conditions in adoption of mobile-based technologies Kajiado North sub-county. The respondents were asked to respond to some statements and questions regarding social influence indicators. The mean values in the tables were interpreted using the following range, 0-1.0 – Strongly disagree, 1.1-2.0 – Disagree, 2.1-3.0 – Moderately disagree, 3.1-4.0 – Agree and 4.1-5.0 – Strongly agree. The standard deviation was used to determine the closenes of the data to the mean nad thus the accuracy of the mean. A standard deviation that was less than 1.5 was considered to be an indication that the values were closer to the mean.

According to the study findings most of the respondents disagreed that the department provides mobile phones for official use, as shown by a mean of 1.53 and a standard deviation of 1.10 which is small thus indicated that most of the data values were close to the mean. The study findings revealed that most of the respondents disagreed with the statement that employees get refunds for money used for airtime to offer public services to the public, as indicated by a mean of 1.53 and a standard deviation of 0.987 which is small thus shows that most of the raw variables were close to the mean.

As per the study findings a majority of the respondents disagreed with the statement that offices have reliable wireless internet that facilitates public service delivery, as shown by a mean of 1.83 and a standard deviation of 1.28 which is small thus showing that most of the data values were close to the mean value. The study findings also showed that most of the respondents disagreed with the statement that the office supports and encourages public to seek services via mobile phones, as shown by a mean of 1.88 and a standard deviation of 1.29 which is small and shows that most of the data values are close to the mean value.

The study findings highlighted that most of the respondents disagreed with the fact that the office provides training on use of mobile technologies, as shown by a mean of 1.65 and a standard deviation of 1.21 which is small thus indicates that the data values are close to the mean values.

Table 4. 6 Facilitating conditions

Statement	**Strongly disagree**	**Disagree**	**Moderately agree**	**Agree**	**Strongly Agree**	**Mean**	**Std Dev.**
Department provides mobile phones for official use	72.5	17.5	2.5	0	7.5	1.53	1.10
Employees get refunds for money used for airtime to offer public services to the public	67.5	22.5	5	0	2.5	1.53	0.987
Offices have reliable wireless internet that facilitates public service delivery	60	20	5	7.5	7.5	1.83	1.28

Office supports and encourages public to seek services via mobile phones	52.5	32.5	0	5	10	1.88	1.285
Office provides training on use of mobile technologies	70	12.5	7.5	2.5	7.5	1.65	1.21

4.2.5 Regression Analysis

The researcher also conducted multiple linear regression to test the relationship between the dependent and independent variables. Statistical package for social sciences (SPSS) was used to code, enter and compute the values of multiple regressions for the study.

Table 4. 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.712	.601	.311	.482

The degree of variation in the dependent variable (adoption of mobile technologies) due to variation in the independent variables (performance expectation, effort expectation, social influence and facilitating conditions) can be explained by the coefficient of determination.

The four independent variables that were studied, explained only 60.1% of the adoption of mobile technologies as shown by the R^2. This means that the other variables that were not covered in this study scope accounts for 39.9% of the variation in adoption of mobile technologies.

Therefore, more research should be done to ascertain the other challenges (37.9%) that influences the adoption of mobile technologies in Kajiado North Sub-county.

Table 4. 8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.582	4	1.645	7.042	.000[b]
	Residual	11.600	50	.232		
	Total	18.182	54			

Source: Research, 2017

The model is statistically significant since it has a significant value of .000 (which is less than 0.05). The F critical at 5% level of significance was 3.23. Also, since the F calculated was greater than the F critical the overall model was significant.

Table 4. 9: Coefficients of determination

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.732	.546		3.132	.003
	Performance Expectation	.126	.131	.232	1.419	0.012
	Effort Expectation	.461	.152	.585	3.696	.005
	Social Influence	.072	.113	.084	.571	.016
	Facilitating Conditions	.149	.095	.199	1.663	.011

As per the SPSS generated table 4.8, the multiple linear regression equation $Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta X4 + \varepsilon$ becomes:
$Y= 1.732 + .126\ X_1 + .461\ X_2 + .072\ X_3 + .149\ X_4 + \varepsilon$

Where Y represents the dependent variable (Adoption of mobile technologies), X_1 is the performance expectation, X_2 is effort expectation, X_3 is social influence and X_4 is facilitating conditions.

Going by the regression equation above, taking all the variables in to account constant zero, adoption of mobile technologies will be 1.732. From the analysis, taking all the independent variables to be zero, a unit increase in performance expectation will lead to 0.126 increase in adoption of mobile technologies. A unit increase in effort expectation will lead to a 0.461 increase in adoption of

mobile technologies. A unit increase in social influence will lead to a 0.072 increase in adoption of mobile technologies. A unit increase in facilitating conditions will lead to a 0.149 increase in adoption of mobile technologies.

From the linear regression results performance expectation contribute more towards the adoption of mobile technologies followed by facilitating conditions, then performance expectation and lastly social influence.

At 5% significance level and 95% level of confidence, performance expectation had a 0.012 level of significance, effort expectation had a 0.005 level of significance and social influence had a 0.016 level of significance whereas facilitating factors had a 0.011 level of significance.

4.2 Summary of the Findings

4.2.1 Performance Expectation

The study found out that performance expectation had a positive influence on adoption of mobile technologies because p value = 0.012. The findings of the study was further in agreement with Alwahaishi and Snášel (2013) who reiterated that performance expectancy was one of the factors that had the strongest significant effect on the behavioral intentions towards the use of mobile Internet.

4.2.2 Effort Expectation

The study revealed that effort expectation had a positive influence on the adoption of mobile technologies in Kajiado North Sub-County (p-value=0.005). This in agreement with a study done by Oye et al. (2014) which showed that the expectation of effort was one of the main predictors to the acceptance and use of technology.

4.2.3 Social Influence

The study findings showed that social influence also had a positive impact on the adoption of mobile technologies in Kajiado North Sub-County (p-value=0.016). These findings are in agreement with a study done by Talukder and Quazi (2011) which noted that social network affects the attitudes toward an innovation. This in turn, impacts on how employees adopt to new innovative technologies. The study also showed that the social network was found to directly affect the innovation adoption process.

4.2.4 Facilitating factors

The study findings revealed that social influence also had a positive impact on the adoption of mobile technologies in Kajiado North Sub-County (p-value=0.011). This is in agreement with a study done by Im, Hong and Kang (2011) which noted that the facilitating condition for a technology is positively correlated with the use of technology. The study also stated that if there are more conditions that support the use of a technology, then people would be more likely to adopt the technology regardless of the country they are in.

4.3 Conclusion

From the research findings above the study concludes that there will be better adoption of mobile technologies in public service delivery if employees are empowered to use mobile technologies like SMS and Whatsapp to carry out their day to day activities. These technologies can be used to get information from the public and also disperse information to them via platforms like social-media or messaging applications like Messenger and SMS.

If the employees are empowered on how to use mobile technologies to ease their work then they are also more likely to adopt the mobile technologies to do their job since they make the job easier to do. If there is enough social influence from other departments in their use of mobile technologies to deliver services to the public then this can trigger an overall desire to implement the same in all the departments thus make public service delivery more efficient and increase adoption of mobile technologies. In the presence of various facilitating factors created by the administration then employees will readily adopt new mobile technologies for use in their work.

4.4 Recommendations

From the conclusions above the study recommends that the county government should empower their employees through trainings on how to use mobile technologies in delivering services to the public. This can also include lessons on how to use social media and messaging applications to carry out their services in a fast and effective manner.

The study also recommends that the national government runs a pilot program in one of the departments to test the impact of mobile technologies on service delivery. Once the pilot is successful then this model can be replicated across all the other departments so that the employees can benefit from the use of mobile technologies in public service delivery.

4.5 Suggestion for Further Studies

The study focused on four challenges (variables) which only influence 60.1% of the adoption of mobile technologies in public service delivery in Kajiado North Sub-County. Further studies should be conducted to establish other challenges (38.9%) influencing the adoption of mobile technologies in public service delivery especially in other counties for purposes of comparison and making recommendations for improvement

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