AN INTEGRATED MODEL OF INFORMATION SYSTEM ADOPTION IN ORGANISATIONS

BY

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DECLARATION

I declare that this dissertation is my own original and has not been, to the best of my knowledge, presented to any other institution of higher learning.

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ABSTRACT

Most organizations are classified as either small, medium or large. Based on the level of classification, there are determinant variables which influence the adoption of Information Systems information systems (IS) within their operations. The study conducted a survey with a sample size of 50 organizations within Kajiado County. The data was collected using structured questionnaires. The administering was on a "drop and pick later" basis. The questionnaires return represented an approximately 70% of the sample population. The data analysis was conducted with the help of SPSS and the results presented in the form of descriptive statistics and hierarchical regression model. Some of the key variables included decision-makers' characteristics, IS characteristics, organization characteristics, and environmental characteristics. Determining the appropriate variables is therefore critical for the success of any organization. The results of this study can be used to identify the key variables that are the drivers for the adoption of IS in the three level organizations. The study therefore provides parties involved with adoption process a practical synopsis of the IT adoption process which is believed to assist them with successful adoption.

Key words: Information systems, business classification, technology adoption

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Naparon; without you, maybe I would be telling a different story. You were ever present and willing to help in every possible way pushing me to the limits.

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DEDICATION

I dedicate this research in loving memory of my mother Doreen Rumbe, for the love, encouragement and the fighting spirit that she bestowed in me.

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CHAPTER ONE

1.0 Introduction

Information and communication technology (ICT) is an interdisciplinary area of research shaped by the fast development of computing, communication, and internet-related technologies. It has a great impact on the society by enabling organizational changes in the way products and services are offered.

The rapid advances in technology and the changing communication channels have transformed the way people work and where they work from. According to Pilat and Lee (2001), to capture the benefits of ICT, it is not necessary to dispose of an ICT producing sector but the timely diffusion of new technology or, from the firm's point of view, its adoption is a key element to securing economic growth.

Technological advancement does not guarantee that it will necessarily translate into successful consumer adoption. Consumers' acceptance and intentions to adopt new technology are crucial aspects of new product development and marketing. Successful diffusion of new technology is partially determined by whether potential users adopt the innovation (Wang and Fang, 2008). IS adoption and use of research mainly to employ positivist approach, theories and models have been used at the beginning stage of research in order to guide the research and interpret its results (Punch, 2005).

Utilization and commercialization of IT becomes more widespread throughout the world and adoption of novel IT can generate new organizations opportunities and various benefits. Both large organizations and small and medium-sized enterprises (SMEs) are seeking ways to

reinforce their competitive position and improve their productivity (Premkumar, 2003). IT tools have significantly assisted SMEs by supporting the required infrastructure in providing timely and appropriate information. It has been found that in spite of the exponential growth of IT within SMEs, the rate of IT adoption has been relatively low (MacGregor and Vrazalic, 2005) , hence large organizations have noticeably profited more than SMEs in both IT-enabled improved sale and costs savings (Riquelme, 2002).

The adoption of information systems has been instrumental in the growth of large organizations providing them with a leverage to increase their market share and spur growth. In spite of the advancement in information systems its adoption has been noted as being relatively low. The lack of its adoption or minimal adoption may hinder organizations growth, and loss of transactions traceability and adverse quality impact on customer products and service offerings.

Studies have been done on IS adoption in various sectors show that socio-cultural factors such as appreciation and perception of IS; attitude of the scientific research community; demographic issues such as age, level of qualification, gender, poverty and literacy levels; communication networks and traditional cultural values , communalism and education culture as factors affecting the adoption of IS.

On IS adoption, utilization and integration of electronic technologies is affected by limited availability of the technologies; unreliability of the available technologies due to secondary factors i.e. power outages and poor reception; lack of training; lack of technical, pedagogical and administrative support; and lack of faculty involvement in decision making relating to electronic technologies (Nyirongo, 2009).

1.2 Problem statement

Although research shows that adoption of IS increases competitive advantages of businesses, such as by making business transactions easier and faster, and communication more efficient (Alam & Noor 2009; Olusola & Oluwaseun, 2013), there has been some reluctance and delay of adopting such systems in developing nations. It is hypothesized that factors such as lack of skilled IS resources and management support among others can contribute to the lack of adoption (Gould, Boies & Lewis, 1991; McCarroll, 1991), but local studies are not in place to investigate the level of influence. Most studies have centered on evaluating factors such as "behavioral intention" and "use behavior" (Davis, Bagozzi, & Warshaw, 1989). There is a gap in the comprehensive modeling that wholly covers the drivers and factors that influence IS adoption from inside and outside the organization.

Any comprehensive assessment of IS adoption must consider both the high-level factors that influence macro-environment of the organization as a whole, and the low-level factors that affect adoption within the micro-environment, i.e. involving characteristics of employees within the business sectors. An assessment model should take both consideration into the analysis at the same time.

Finally, many existing studies have assessed IS adoption strictly within specific sectors, such as the banking sector (Martins et al. 2014), or the retail sector (Munusamy et al. 2013). The gaps addressed in these studies only inform those specific sectors. However, it is important to identify factors that spread out across multiple diverse businesses of both small and medium sizes, to enable results to be applied in diverse business backgrounds.

1.3 Aim and objectives

1.3.1   Aim

The aim of this study is to establish the factors which determine IS adoption in business

organizations.

1.3.2   Specific objectives

The specific objectives of the study are:

1. To identify the characteristics and determinants of the adoption of IS among small and

    medium businesses.

2. To identify the best practice recommendations for designing effective adoption strategies.

3. To design and implement appropriate models for the IS adoption data of Kajiado business

    sectors.

4. To evaluate the developed model.

1.4 Research questions

1. What are the determinant variables for adoption of IS in organizations?

2. What are the best practices employed IS adoption in Parastatals, Public service or civil

    service and Private organizations?

3. What are the appropriate models for IS adoption data of Kajiado businesses sectors?

4. How well does the data of Kajiado business sectors fit to the modeling framework?

1.5 Significance of the study

The results of this study is expected to

1. Leverage the adoption of IS in organizations. Improve the efficiency and effectiveness of their business processes

2. Influence organizations decisions making. An IS is a system that collects, records, stores, and process data to produce information for decision makers

3. Improve the quality of products and services offered to customers. This brings about electronic business, which increases organizations' revenue and operational efficiency.

1.6 Chapter Summary

The rest of the thesis is presented as follows: Chapter 2 focuses on review literature related to technology adoption and technology adoption models and frameworks. Chapter 3 covers research methodology: research design, population size and sample, data collection instrument and data analysis approach. Chapter 4, presents the results; general characteristics of the respondent, Pearson correlation statistics moderating factors and a detailed discussion of these results while Chapter 5, covers the conclusion of the study, research contributions and recommendations

CHAPTER TWO

2.0 Literature Review

2.1 Introduction

Global advancement in technology specifically in the field of computing and information has spurred research interests in predicting and enabling the adoption and use technology in organizations (Venkatesh, 2003). The developed countries are spearheading these researches in the past decade and there is gradually acceptance by developing nations (Wang and Shih, 2009).

There are several factors that have been determined to influence the adoption of IS systems in organization. Change of organizational strategies such as performance, profitability, efficiency, productivity, quality have led to the adoption of IS as an enabler to meet these requirements. It is therefore critical for organizations to determine the potential voids that can be filled by adopting IS. Key areas of concerns include IS performance, integration, penetration and payback (Landt & Damstrup, 2013).

- Performance: IS platform adopted should possess a high level of accuracy, must meet the existing processes and be scalable, possess high reliability and be compatible with the existing organizational equipment.

- Integration: The adopted IS systems should be seamless and provide smooth transition during the use in current environment and conditions at the same time be cost effective.

- Penetration: There must be a buy in by the users, and special training offered with focus on the benefits, capability and flexibility that IS system offers in meeting the current and future workforce loads.

- Payback: The IS system selected should be cost effective and its returns should exceed the cost of equipment support acquisition and other relevant costs such as training.

Business enterprises should be strategic and conscious to ensure timely selection and adoption of IS systems. Enterprises that are late entrants in the adoption of IS may lead to loss of market share, while reducing the potential and ability to compete in the changing business environment. Some of the business leaders in the adoption of IS have been cited as being tenacious and have strong domination in market shares (Landt & Damstrup, 2013).

Advantage of IS

One of the advantage of IS system is the ability to store/access and share information using the cloud services enabling quick decision making which impact SMEs production. (Development, 2007).

Disadvantages

Some of IS application are complex, high cost, and security concerns (Djatikusumo, 2014).

2.2 Factors to consider for IS adoption in organizations

Some of the critical success factors that influence the adoption of IS systems in organization includes the following: Cost effectiveness, availability and development of users' skills, and management support etc.

2.2.1 Cost Effective ICT Services

The use of IS systems as a communication and information sharing tool is essential in promoting and creating enabling environment for small enterprises (SMEs) to achieve competitive advantage against their competitors (Development, 2007). Most SMEs are reluctant to conduct their business using the IS systems due to the high cost of systems adoption. These cost increase

significantly due to their inaction to adapt to the dynamic competitive environment (Makau, Wawire, & Ofafa, 2013)

There are extra costs such as maintenance, equipment, training, upgrading cost that has led to slow or non-adoption of IS by organizations utilizing minimal IS applications and those using manual approaches. This has led to partial acceptance to the use of IS by SMEs (Apulu*et al*, 2013; Harrigan, Schroeder, Qureshi, Fang, Ibbotson, Ramsey, & Mesiter, 2010). The lack of financial funding and the high cost of IS implementation is also a major obstacle for SMEs decision in adopting IS (Djatikusumo, 2014; Kabanda 2011).

2.2.2 Availability and Development of IS Skills

There has been a radical shift from development of manual technical skills to technology/knowledge skills Olusola & Oluwaseun (2013). The lack of skilled associates by adopters and non-adopters has been identified as the leading factor in hindering IS adoption among SMEs (Apulu*etal,* 2011); (Apulu, Lathama, & Moreton, 2013); Manuere, Gwangwava, &Gutu (2012). Furthermore, lack of both internal and external support expertise has been a major contributor for non-adoption acceptance (Harrigan*et al*, 2010) and Alam& Noor (2009). This has resulted to the manual operational process which tend to be costly (Olusola & Oluwaseun, 2013).

2.2.3 Management Support

Management support and commitment is critical to the success and implementation of IS in an organization (Gono*et al,* 2013); (Duan, Deng & Corbitt*,* 2012; Jeyaraj,Rottman and Lacity*,* 2006). Elbeltagi, Sharji, Hardaker, & Elsetouhi (2013) identified that IS adoption is dependent on the managerial features such as innovativeness, active participation, experience and

knowledge of IS. Therefore, a prerequisite for successful adoption requires managers to possess a working knowledge of the new technology.

Organization executive leadership and top manager knowledge of IS and a favorable attitude towards IT, increases the chances for IS investment (Harrigan*et al,* 2010). It's important that training be provided on IS and its perceived benefits which contributes to the overall business success (Manuere, Gwangwava, &Gutu, 2012). Alam & Noor (2009) identified that the reliance on IS by SMEs CEOs or owners in making decision varies based on the size of an organization. Therefore, it is essential for SMEs to evaluate employee's skills and or knowledge on IS as to effectively influence the performance of SMEs.

According to Warue & Wanjira (2013) most managers among the SMEs are reluctant to train their staff on IS applications due to the fear of their job takeover by their subordinates.

2.3 Evaluation of IS

Adoption of IS systems has an impact organization process, strategies, and users that will be involved in executing the various plans. Its therefore important to examine to determine the interactions between IS and organizational processes, equipment and users and not as a standalone entity Haider (2011:1).

Evaluation has been identified as an integral part of adoption of IS. It has been described by Technopolis Group and Mioir (2012), as "a systematic way of collection, coordination and analyzing information based on the functions, characteristics and output of a process which is intended to form the grounds for judgment, inform decisions made on current and future events, and while also looking at the level of effectiveness and efficiency of its outcomes". Lack of evaluation on the feasible potential of a new technology provides a challenge for organizations to understand the dynamics and magnitude of the potential obtainable from the adoption of the new

technology. Nguyen *et al.* (2013:2). The evaluation process of new technology starts with the familiarisation of the advantages, implications, constraints, information and potential of the new technology. When knowledge of a new technology has been obtained, the adaptability, applicability, compatibility and capability of the technology determine the decision to possibly accept, adopt and implement the new technology (Dyerson *et al*., 2009). Thus, non-adoption of technology is often based on the lack of evaluation of the potential and constraints relating to the adoption and utilization of the new technology (Cowan & Daim, 2011; Cragg *et al*., 2010).

Evaluation can be grouped in two stages i.e., Formative and Summative evaluation. Formative evaluation examines the initial steps and processes considered prior to the adoption of IS Technopolis Group and Mioir (2012). These steps have been covered by (Schumpeter 1947) in his theory of Diffusion of Innovation. The IS adopters must first identify the need and supportive requirements to enable them to make an informed decision. In addition, they must be selective in the IS platform to be acquired and be aware of the functionality of IS to enable the current and new processes (Schumpeter 1947; Technopolis Group and Mioir 2012).

Summative evaluation examines the impact on a process based on the outputs and involves ascertaining the actual contribution of the adopted IS systems. Furthermore, focus is also on capturing financial trends in regard to time and resources. Other intangible benefits e.g., customer satisfaction can be subjectively measured (Palvalin *et al*., 2013; Technopolis Group and Mioir (2012)).

According to Baehr (2004) some of the key parameters of value that need to be considered for a successful IS evaluation includes:

- Deciding at what point in time to start evaluation procedures

- Deciding what exactly needs to be evaluated

- Deciding the purpose of evaluation

- Deciding on the skills of the evaluator

- Deciding what particular scope and type of questions the evaluation intends to address

- Making adequate plans to facilitate the evaluation study and the time of expected Outcome

- Deciding how to present the findings in the report of the evaluation study

- Making provision to accommodate potential interpersonal, political and ethical considerations in the evaluation study

2.3.1 New Technology Potential for Business

Evaluation of new technology by SMEs is of high priority due to the high capital investment and the considerable degree of uncertainty and unknown associated risks applicable to the technology (Love *et al.*, 2004). According to Fitzgerald (1998), evaluation of ICT investment is a difficult process, especially to determine the return on investment. The failure to evaluate and the lack of proper understanding of the implications of adopting IS on the business in its entirety, may lead to the adoption of inappropriate IS or the non-adoption of a potential new IS with advantages for business growth (Palvalin *et al*., 2013; Abulrub *et al.*, 2012). The more effort placed in a detailed analysis of a new technology, the more advanced knowledge is gained of the potential impact of

the technology. For a business to fully realize the accruable beneficial impact of new technology, the technology must be suitably in synchronization with the business process and utilized in the best manner to function appropriately (Palvalin *et al*., 2013).

One of the motives for businesses adopting new technology is to gain more from their initial investment outlay according Chan *et al*. (2012), Lee *et al*. (2010) and Love *et al*. (2005) is by focusing on improving the profitability of the business through an increase in work efficiency, quality of service, productivity ratio and cost reduction in the long run. Chan *et al*. (2012), Cowan and Daim (2011), Rodríguez and Pozzebon (2011), Dyerson *et al*. (2009) and Nguyen (2009) posit that for new technology to be fully adopted and utilized appropriately, an evaluation of the applicability, adaptability, compatibility and capability features and characteristics of the new technology must be highlighted. The evaluation must be done in view of the potential benefit of integrating new procedures into the business system.

The projected life span and continuing relevance, estimated cost implications over a period, and the expected returns on investment projected for the same period, are important considerations. Abulrub *et al.* (2012) and Cowan and Daim (2011) state that these evaluation procedures of technology forecast, need to evaluate each particular technology and SMME according to individual context or collective characteristics. The evaluation thus incorporates surrounding factors such as environmental, political, cultural, ideological, religious, economic, geographical, organizational and regulatory policies and behavioral tendencies of the business (Landt & Damstrup 2013). The relating relevant factors present must all be taken into account in the evaluation process. The evaluation should be properly investigated, documented and show the advantages and disadvantages of the potential technology. The result of the projected impact

of the new technology on the business over a set period and range of time should be clearly stated. Another key factor to take note of is the risk involved in the uncertainty of the future of the technology, although it is generally expected that return on technology should outweigh the risks associated with the adoption (Abulrub *et al*., 2012; Chan *et al*., 2012)

Also of note, according to Abulrub *et al.* (2012), is the potential need for training and support of employees if the adopted technology requires up-skilling and operational knowledge of the new system. This requires delicate and successful change management handling to integrate the new technology into the business process. SMMEs usually do not possess the required skills and knowledge to handle new technology (Chan *et al*., 2012). (Abulrub *et al*., 2012; Love *et al*., 2005).

2.4 Information systems adoption levels

Martin & Matlay (2001) provided a progressing framework referred to as the "Adoption Ladder". The adoption ladder consists of five steps which can be used to position organizations in regard to their current IS adoption stage. The adoption ladder measures the level of ICT adoption based on two dimensions; *business benefits* and *extent of organizational change and sophistication.* The ladder comprises of the following steps:

i.   E-mail – Basic e-mail communication involves communicating with co-workers in the company and receiving/sending e-mails outside the company.
ii. Website – Used for marketing purposes and for suppliers to lookup information.
iii. E-commerce – Customers can order and pay online at all times of the day, higher-level accessibility.
iv. E-business – Incorporates a higher level of integration with the company functions together with e-commerce, which involves technical support and other services.

v. Transformed organizations – This highest level of ICT sophistication concerns integration with the firms' business model and applies mainly to companies using Internet as a platform for their daily business activities.

Figure 1 - Adoption Ladder. (Martin & Matlay, 2001)

The adoption ladder is one the most widely used technology push-models (Zappalà & Gray, 2006). However, it receives critique for being too linear when describing processes that are non-linear and complex (Zappalà & Gray, 2006). But it still describes a sense of technological progression in a very direct and easy to understand way.

Kilangi (2012) and Mpofu et al., (2013) have used this framework to map out where firms are positioned concerning their ICT adoption levels. Mpofu et al., (2013) notes that there were "notable differences in the level of organizational readiness and stages of IS adoption" among their investigated cases. Kilangi (2012) suggests that a lot of firms in the developing world are still in the first or second stages of ICT adoption, where more advanced levels of ICT are not very desirable or possible due to barriers.

2.5 Review on IS framework

Different theories and models in literature have been trying to explain the underlying factors

of ICT adoption and diffusion behavior. Many of these theories roots down to the Theory of

Reasoned Action (TRA) (Fishbein & Ajzen, 1975), Diffusion of Innovations Theory (DOI)

(Rogers, 2003), Theory of Planned Behavior (TPB) (Ajzen, 1991) and Technology

Acceptance Model (TAM) by (Davis, 1989). These authors are all well cited within the ICT

adoption-diffusion area and this study has chosen to rest on the theories and models mentioned

above.

2.5.1 Diffusion of Innovation

Innovation Diffusion Theory (IDT) focuses on processes by which innovations in technology are

adopted by users (Rodgers, 1995). Various attributes such as new IS compatability, complexity,

trialability, observability and relative advantage have to be considered prior and post adoption of

new IS systems Rodgers (1995); Chen et al., (2000). Key features to successful IS adoption

include open leadership that embraces change and internal and external organizational structures

and vision of growth (Rodgers 1995)

IDT comprises of five process steps which involves users acquiring and being *aware* of

the technology. Awareness is gained through the media, conferences networking and exhibition.

This opens up avenues of *persuasion*, where user is presenter with insights of new technology

and benefits therein. The user then has to make strategic *decision* based on available information

including functional, cost and risk to enable informed decision to accept or reject the presented

technology. *Implementation* follows an acceptance decision. This involves ensuring current and

new process integrates with new technology. Key performance indicators have to be established to ensure the adopted system performance is realized. *Confirmation* is the final process where users make selective decision to continue or discontinue with the adopted system after operational requirements have been analyzed (Rodgers 1995). The aforementioned process are critical and needs to be considered during IS adoption. Failure or omission of any process may be costly for any organization if investment in resources and equipment has been implemented.

2.5.2 Theory of reasoned action (TRA)

The TRA model is a theory with the ultimate goal set on predicting and understanding an individual's behavior (Ajzen & Fishbein, 1980). The model is generic and can be applied in many different situations, therefore it is of relevance to this study, as we want to know why people, and in the end firms, engage in a certain behavior within the context of this study on ICT adoption and implementation. Ajzen & Fishbein (1980) puts forward in their book that the theory rests on certain internal as well as external determinants that will predict the actual behavior of an individual, as shown in Figure 2.

The theory of planned behavior (TPB) by (Ajzen, 1991) is developed from the theory of reasoned action (TRA) by (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) and the technology acceptance model (TAM) by Davis (1989) is an extension from the TRA whichincludes the technological acceptance measures perceived ease of use and perceived usefulness. However, regarding the TPB, Grandón et al. (2011) states "academics should select the more parsimonious model (TRA) to study e-commerce adoption issues in developing countries." And based on this conclusion and our interpretations of literature using this model, we will use the TRA when explaining adoption behavior.
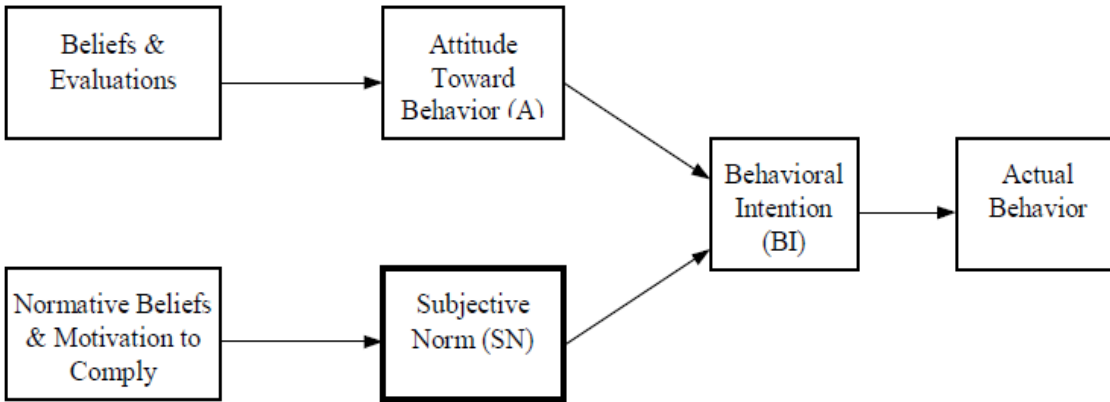
Figure 2 - Theory of Reasoned Action (TRA) (Davis, Bagozzi, & Warshaw, 1989)

TRA is developed from the social psychology domain and underpinned by three defining constructs:

i) Behavioral intentions (BI): It is a combination of both functions of attitude and subjective norm towards a particular behavior, which can be used to predict an actual behavior.

ii) Attitude (A): The combination of beliefs of a certain behavior weighted against each other.

iii) Subjective norm (SN): The amount of influence people in a social environment have on one's behavioral intentions.

The TRA proposes that the behavioral intention of a person is based on the person's attitude relative to the behavior and the subjective norms, which translates that, if a person intends to behave in a certain manner, then he will do as intended. However, Ajzen and Fishbein (1980) suggest that norms and attitudes are not of equal weight when predicting behaviour; it depends largely on the person and the situation involved, and the effect of these factors might vary depending on their behavioral intention.

2.5.3 Technology acceptance model (TAM)

Rogers (1995) provides a framework that is more focused on the diffusion of innovation on an organizational level while Davis et al., (1989) research focused in investigating the perceived individual benefits in regards to new technology. Davis et al., (1989) presented that there was lack of sufficient evidence for valid measurements to predict an individual's acceptance of systems use. Davis et al., (1989) researches focused on two constructs i.e., *perceived usefulness* (PU) and *perceived ease of use* (PEOU) of a system.

Davis (1989) defines perceived usefulness, as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989, p. 320). Other definition of perceived ease of use was to be considered as "the degree to which a person believes that using a particular system would be free of effort" (Davis, 1989, p. 320). Evaluation of a system limitations to a process is critical as there may be instances where the use of systems may not lead to any performance gains.
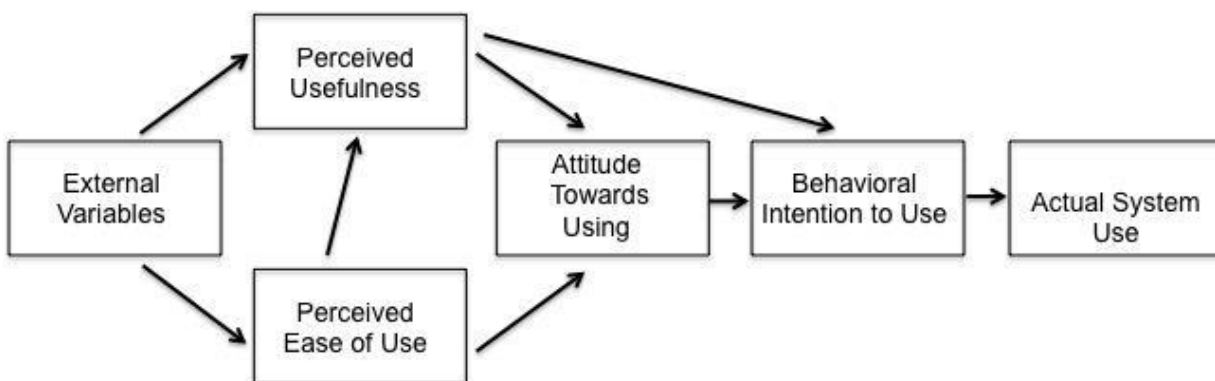

Figure 3 - Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1989)

According to Davis (1989) there are various subjective questions that require users' response to determine the benefit of any new systems. The questions varies from perceived and actual productivity, quality, ease of use, timeliness among others. Such questions can be scored using a

Likert scale and analyses conducted. The responses are to be used as determinants to support adoption of new IS.

Due to the sometimes harsh living conditions in developing countries and the scarcity of resources, we argue that individuals become more rational in their choices and thinking in developing countries. The perceived usefulness (PU) (Davis, 1989) of a new technology becomes more important as a certain "utility focus" becomes apparent when resources are scarce in developing countries, which also puts growth constrains on knowledge intense firms in these resource scarce environments (Maxwell & Reuveny, 2000). There is however critic being raised to both the TAM, TRA and TPB, Bagozzi (2007) argues that there are several gaps in the theories and proposes a paradigm shift in the information system (IS) research regarding technology information adoption/rejection/acceptance. Where the author believes that the IS research concerning these topics are on the "threshold of crisis, if not chaos, in regard to explaining technology acceptance" (Bagozzi, 2007). We believe however that the current framework proposed in this paper, which includes TAM, TPB, TRA and Rogers's, Diffusion of Innovations will adequately answer the stated research question.

CHAPTER THREE

3.0 Research Design and Methodology

This Chapter presents the research approach and strategies for fulfilling the study objectives and conducting this study. The approach for collecting and analyzing qualitative data will be discussed within the specified scope of the study. The Chapter also provides the conceptual framework and deliberates on the data collection and sampling techniques that were applied for identifying the relevant participants. The chapter further reports of the research strategy for analyzing the qualitative data through measures of central tendency (mean, standard deviation) and multi-level logistic regression.

3.1 Research Approach

There exist two key approaches in research which clearly identify the investigation path should be followed (Saunders et al., 2009). The first approach is deductive, which is concerned with building a theory with hypotheses and seeking to test the validity. The second is the inductive approach which focuses on collecting empirical evidence and building a theory from the findings (Creswell, 2009).

Deductive research is the dominant approach in natural sciences where a theory is rigorously tested in a controlled context according to the prevailing laws of the environment which makes predictions about the outcome (Saunders et al., 2009). In inductive research, the researcher observes the patterns that are derived from empirical evidence, and infers the findings to the theory. This is called "theory building research" (Bhattacherjee, 2012). The methodology of this study makes heavy use of inductive research to collect new evidence from the primary data that is collected by the researcher. It must also be noted that deductive research has been

applied, because the study uses advice from the literature review to establish a framework for collecting data and assessing the evidence.
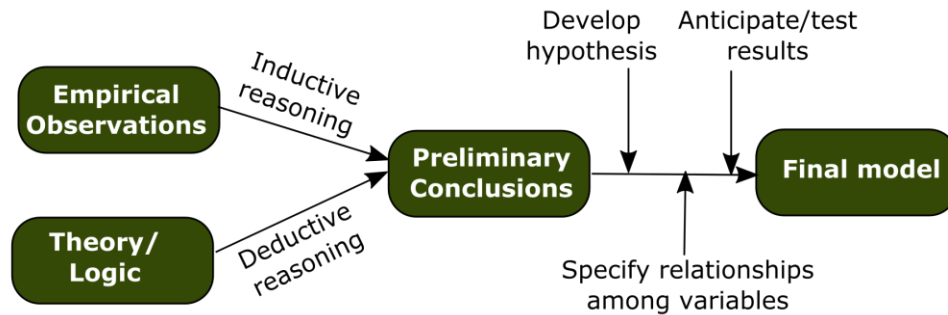

Figure 4: The applied research approach for the study

Since the research hypothesis of the study is subjective in nature, an inductive approach was followed using a qualitative method of research in order to build upon previously identified theories or create new ones by inferring from patterns formed from the observed findings using empirical data.

3.2 Conceptual Framework

This framework specifies the variables that were relevant for the study and how they interrelate. Because the modeling approach is hierarchical, variables have been specified at the personal level, at the organizational level and across the different organizations that were selected for the research.
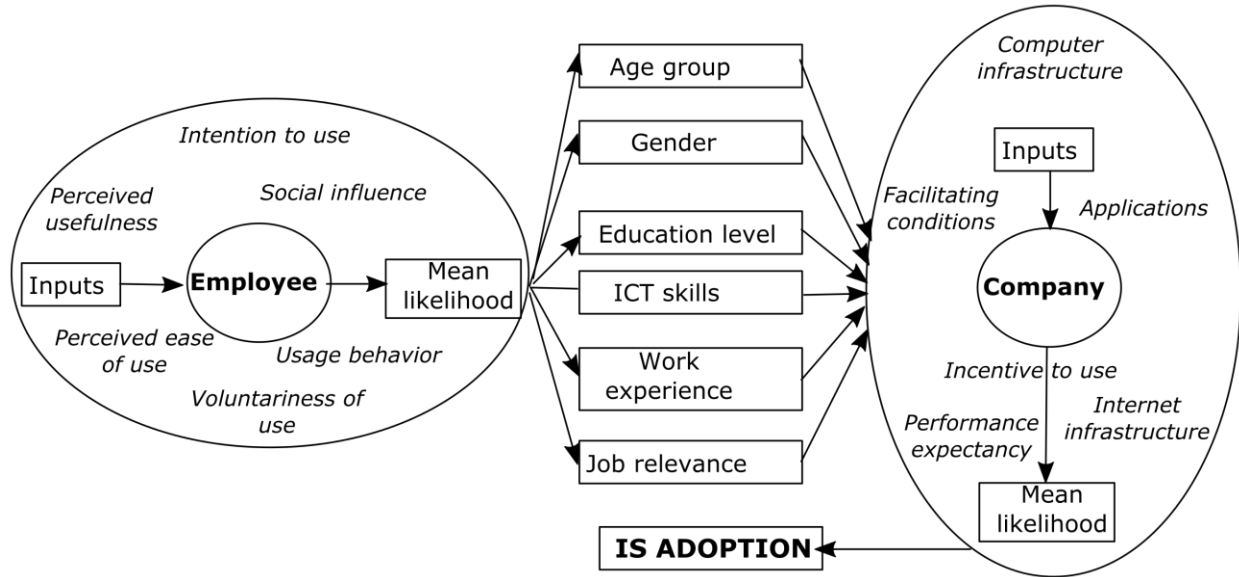
Figure 5: The conceptual framework for the study

3.3 Research Strategy

The research has been conducted using multiple sources and types of primary data to inform the triangulation of evidence, increase the reliability of results and properly corroborate the data gathered from other sources (Yin, 2009). The case study research collected data using various methods such as questionnaires, document analysis, participant observation, and collecting company statistics.

3.3.1   Addressing the Research Objectives

The main objective was *to establish a framework assessing factors which determine IS adoption in organizations*. In order to meet this objective, specific objectives were addressed in the methodology section as follows:

Objective 1: *To identify the characteristics and determinants of the adoption of IS among small and medium businesses*. This was achieved by collecting questionnaire responses from

22

employees of different business sectors. The sampling technique and size is explained in Section 3.4. Additionally, characteristics of businesses that are hypothesized to determine the level of IS adoption were identified and used to collect primary and secondary data from selected businesses.

Objective 2: *To identify the best practice recommendations for designing effective adoption strategies*. This was achieved by extensively reviewing the literature (Chapter 2) and critically assessing different expert recommendations, in order to establish a conceptual framework for data collection and analysis. This resulted in mapping out an effective conceptual framework suitable for analyzing the local data for Kajiado country. This framework is shown in Section 3.2.

Objective 3: *To design and implement appropriate models for the IS adoption data of Kajiado business sectors.* Descriptive strategies were used to identify specific patterns and trends in the collected data for employees and companies in Kajiado. This informed implementation of proper models of the data to assess IS adoption. A hierarchical logistic regression model incorporating three models was created. This model is explained in Section 3.5.

Objective 4: *To evaluate the developed model.* Using the results of the hierarchical model developed above, the model was tested for success. This involved using the Akaike Information Criterion (AIC), a measure of statistical quality control (Hu, 2007). The model's goodness of fit was tested and the results are shown in Chapter 4.

3.3.2   Case Study Designs

Four types of case study designs were considered within the domain of data collection and analysis, according to Sanders et al. (2009):

i)   Single case (holistic design) – where the unit of analysis is one single subject, and where the subject is unique.

ii) Single case (embedded design) – this contains more than one unit of analysis present in an organisational context.

iii) Multiple case (holistic design) – where the phenomena being studied is compared with other cases across different organizations.

iv) Multiple case (embedded design) – where each case study is uniquely addressed according to the phenomena being studied.

A holistic design was applied to create models that offer analytical evaluation of ICT adoption within organizations by examining individual perceptions from company employees, how these perceptions were influenced by their own characteristics (e.g. gender and ICT skills), and how factors within the organization were influencing adoption in combination with the characteristics above.

3.4 Data Collection

Data for this research was collected from multiple different resources. This included secondary (through literature review and document analysis) and primary sources (through observations, surveys and issuing of questionnaires). Data collection was carried out by physically moving from organization to organization. Pre-established salient points and semi-structured questionnaires were used to uncover deeper meanings through a qualitative research design

method using a multiple case study.

3.4.1   Sampling Techniques

Sampling techniques are designed to reduce the cost and amount of work that would be required to select all samples of an entire target population. Therefore, this study adopted a judgmental sampling technique that has been prescribed by Yin (2009) for qualitative research in a multiple case study design. Other options include convenience sampling, quota sampling and snowball sampling (Yin, 2009). Since the nature of the research was exploratory and required an in-depth knowledge of the research problem, a total of 50 SMME samples were selected according their geographical location. The selected SMMEs were defined based on the number of employees and total annual turnover. Although an attempt was made to make the selections based on a cross-sectional category of business sectors, samples from only five sectors could be accessed to produce the required data and saturation level needed. The selected SMMEs worked with different types of ICT tools and technologies, and they were mainly those that have recently adopted a new technology, are in the process of adopting a new technology, or have not adopted any new technology.

3.4.2   Sample Size

The SMMEs were selected based on their function and geographical coverage. All 50 participating SMMEs were selected on the basis of their operational size and geographical location in line with their business sectors. The diverse selection granted the researcher the opportunity to interact with individual activities, perceptions and experiences of each SMME

within different cultural and business environments and social backgrounds. The selection thus allowed the researcher to examine and assess the findings in a contextual and multi-variant environment. The business sectors refer to the SMMEs operating in the retail sector (45%), the education sector (10%), the manufacturing sector (10%), IT and consulting services (25%), and the insurance sector (20%). The breakdown is as shown in Table 1 below:

Organization Number	Organization Sector
1	Retail
2	IT& Consulting Services
3	Retail
4	Retail
5	Manufacturing
6	Education
7	Retail
8	IT& Consulting Services
9	Retail
10	Retail
11	Retail
12	Insurance
13	IT& Consulting Services
14	IT& Consulting Services
15	Manufacturing
16	Retail
17	Education
18	IT& Consulting Services
19	Retail
20	Insurance

Table 1: Illustration of the sampled SMMEs

All the identified SMMEs use some form of ICT in their business processes. These SMMEs were all in a range of between 10-150 employees and produced a total annual turnover of less than 80 million Kenyan Shillings. The units of analysis selected were geographically placed in the

Kajiado County and within a 30 kilometer radius of the town center. This coverage of the study was manageable given the time frame and financial restrictions.

In addition to collecting data for each sampled SMME, a total of 6 participants who are employees of the organizations were randomly identified and given questionnaires. They were also asked general questions to provide insights about aspects of their organization that can promote or hinder the success of IS adoption. The initial expectation was to sample a total of 300 participants from all the selected SMMEs, but a 13% non-response rate was experienced. This resulted in a total sample of 261 employees. According to Feder and Pfeffermann (2015), this rate of non-response is within the acceptable threshold of 25%.

3.4.3 Qualitative Data Collection/ Variables

The main method of collecting data from individual participants (the employees) was by administering questionnaires. Participants were asked descriptive questions about themselves and a set of 26 questions (Appendix 1) to measure different IS adoption preferences. For the latter, each response was measured using a 5-point Likert scale (with 1 as the most negative and 5 as most positive). These questions were combined into a set of five variables that have been shown in the conceptual framework and are illustrated below:

Variable/ Category	Indicators	Cronbach Alpha (α)
Intention to use	Questions 7-10. The extent to which a participant is already using IS tools and applications within and outside the workplace, and if they would use any that were made available in the business premise.	0.83
Perceived usefulness	Questions 11-14. The extent to which IS adoption, use and expansion will lead to new commercial opportunities, and whether or not the currently available IS tools and applications are suitable for such expansion.	0.81
Perceived ease of use	Questions 15-19. The ease of using various ICT applications within the business unit. Measured perception is in line with the technical skills of the participant.	0.78
Social influence	Questions 20-23. The extent to which existing social and cultural aspects encourage or promote personal actions that lead to IS preference or innovations, in turn affecting the organization's likelihood of IS adoption or IS expansion. The adoption category.	0.85
Usage behavior	Questions 24-28. The scope of usage of the IS infrastructure, tools and technologies on a day-to-day basis and for basic operations	0.77
Voluntariness of use	Questions 29-32. The extent to which an employee applies, supports and encourages existing IS tools, applications and innovations within the organization.	0.85

Table 2: Participant survey framework and conditions

The data representing all the indicators is highly reliable, as based on the high Cronbach alpha values ($\alpha > 0.75$). In addition to data collection in the categories above, the sampled employees were asked questions on six personal attributes which were recorded for every participant: Their age group (as 15-25Yrs, 26-35Yrs, 36-45Yrs, 46-55Yrs and above 55Yrs), gender (as male or female), education level (as no college education, college or basic university education, master degree, PH.D), ICT skills (as novice, basic or proficient), work experience (as 0-2Yrs, 3-5Yrs, 6-

10Yrs and above 10Yrs), and job relevance with ICT (as not relevant, quite relevant, relevant, and highly relevant). In total, participants responded to 32 questions.

For each organization, data was collected to measure graded levels (1-15) of the following six variables: The computer infrastructure, facilitating conditions, ease of applications, incentive to use ICT tools and technologies, performance expectations, and internet infrastructure.

3.5 Analysis Strategy

The initial fact finding was carried out by using basic measures of central tendency. This involved deriving means and standard deviation statistics. Prominent variables were identified and the pattern for these variables were charted out using bar charts and pie charts.

To evaluate how employee characteristics come together with organizational characteristics to influence IS adoption, a hierarchical regression model was formulated to combine the qualitative data from individual participants with the organization data of where they were employed. This used logistic regression with three levels that are structured as follows: Level 1 measures the mean value for categories of responses for a single participant using the model;

$$Y_{ijk} = \pi_{jk} + \sum_{m=1}^{M-1} \alpha_m D_{mijk} + e_{ijk,}$$

where π_{jk} is the mean outcome from all the responses of a particular employee, which is referred to in the Level 2 model. Y_{ijk} is the likelihood of receiving a certain form of response (e.g. highly

positive) for a specific question (i) from a specific employee (j) of a specific company (k). This likelihood is measured in the middle part and e_{ijk} denotes the error.

Level 2 measures the mean value of response within the organization;

$$\pi_{jk} = \eta_k + \beta_1 \text{AGEGR}_{jk} + \beta_2 \text{GEND}_{jk} + \beta_3 \text{EDU}_{jk} + \beta_4 \text{ICT}_{jk} + \beta_5 \text{EXP}_{jk} + \beta_6 \text{REL}_{jk} + r_{jk},$$

where η_k is the mean outcome for all the employees of a particular organization, which is referred to in the Level 3 model. Beta values for the six personal attributes shown in the conceptual model are measured in the middle part of the equation (age group, gender, education level, ICT skills, work experience, and job relevance with ICT). r_{jk} is the error.

Level 3 measures the grand mean value for all organizations;

$$\eta_k = \gamma_0 + \gamma_1 INFRA_k + \gamma_2 COND_k + \gamma_3 APP_k + \gamma_4 INCENT_k + \gamma_4 EXP_k + \gamma_4 INTNT_k + u_k,$$

where γ_0 is the grand mean and organization attributes are computer infrastructure (INFRA), facilitating conditions (COND), ease of applications use (APP), incentive to use ICT tools and technologies (INCENT), performance expectations (EXP), and internet infrastructure (INTNT). u_k denotes the error of the grand regression estimation.

3.5 Ethical Considerations

The researcher asked and received permission from the administration/authorizing offices of the targeted organizations before conducting the data collection. The firms were reassured of the privacy and confidentiality on the information which they provided.

In order to ensure that prospective respondents willingly participated in the study, a debriefing section was held with each participant. They were informed of the significance of their contributions and the scope within which their responses would be applied for the research work. Their consent was sought before they were asked to participate in the study and the respondents will be requested to exercise honesty when filling the questionnaires. The field of name in the questionnaire was optional, and it was therefore not used in the analysis.

CHAPTER FOUR

4.0 Data Analysis and Results

This Chapter provides the results from the different analyses of sampled data. SPSS version 16.0 software was used for most of the data analysis.

4.1 Descriptive Statistics (Objectives 1& 2)

Descriptive trends in the study variables are summarized in Table 3. 4.1. Participants were mostly in their early 30s, but with a standard deviation of ±11 years. There were more males than females in the survey (62% males and 38% females). The average participant had at least college or university education, and most had basic ICT skills, at least they were able to use smartphones and communicate through the social media. Many employees were stable workers, having stayed at their work places or positions for at least 4 years (std. dev. of 2 years). Finally, a large majority thought that ICT was relevant for their work requirements.

ID	Variable name	Description	Mean	Std. Dev.
	Level-1 variables (n=261 employees)			
1.	Age	NUMBER	32	11.342
2.	Gender	CATEGORICAL (M/F)	1.3	0.242
3.	Education level	CATEGORICAL (4 Levels)	2.256	1.487
4.	ICT Skills	CATEGORICAL (3 Levels)	2.429	0.911
5.	Work experience	NUMBER (Years)	4.035	2.328
6.	Job relevance with ICT	CATEGORICAL (4 Levels)	3.576	1.009
	Level-2 variables (n=50 SMMEs)			
1.	Computer infrastructure	CATEGORICAL (9 Levels)	3.521	0.991
2.	Facilitating conditions	CATEGORICAL (9 Levels)	3.234	0.101
3.	Ease of applications	CATEGORICAL (5 Levels)	3.901	0.522
4.	Incentive to use ICT	CATEGORICAL (5 Levels)	2.119	0.765
5.	Performance expectations	CATEGORICAL (5 Levels)	2.007	1.124

| 6. | Internet infrastructure | CATEGORICAL (5 Levels) | 1.827 | 0.945 |

Table 3: Results of descriptive statistics of the study variables

Looking at the average values for organization-level variables, ease of applications was rated the most high. This is because many organizations that used some level of ICT had installed basic applications. The internet infrastructure was the lowest as most business did not have Internet connectivity. Computer infrastructure was also not very well established among the SMMEs in Kajiado County. Standard deviations were not very high for level-2 variables, indicating that most of the sampled businesses were quite homogenous.

The charts below show the pattern of ICT skills among the sampled employees which was highly rated, as well as the user friendliness of applications at the SMME level. Basic computer applications e.g. word processing applications are the most commonly used, followed by smartphone browsing and the use of WhatsApp communication. Similarly at the organization level, basic applications were recorded to be the most user friendly. Expert systems were seen to be not so easy to use.
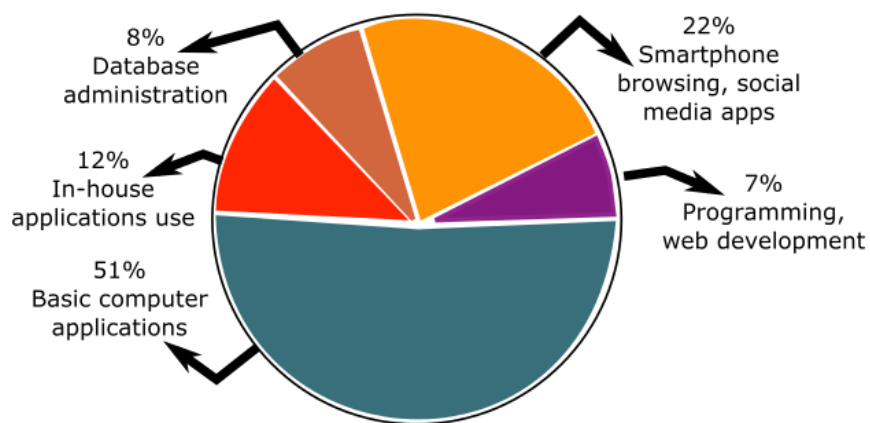
Figure 6: Categorization of different ICT skills among the surveyed employees
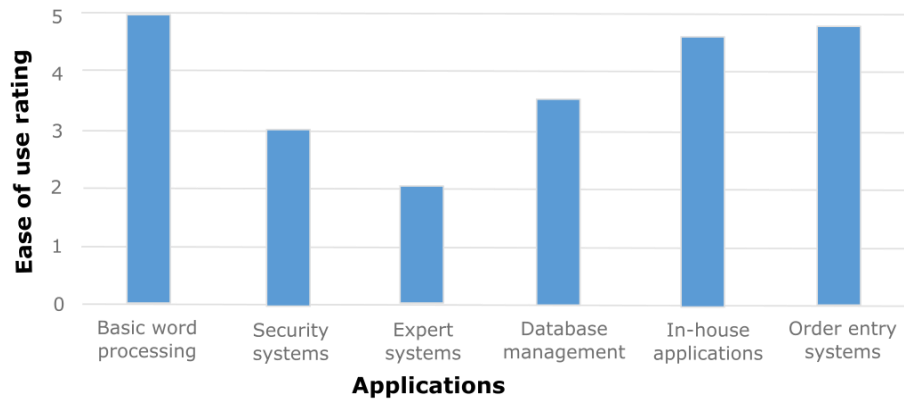
Figure 7: The rating of ease of use for various common applications among SSMEs.

4.2 Logistic Regression Model Results (Objective 3 & 4)

The likelihood of IS adoption across the different SMMEs in the study sample for the five categories: were 13%, 21%, 17%, 32% and 18% respectively. This indicated that responses were largely homogenous around the middle scale points of the 5-scale Likert chart. The hierarchical regression model in Table 3 identified that 5 employee-related variables (age, education, ICT skills, work experience and job relevance to ICT) significantly influenced IS adoption in the organization. ICT skills of employees was the highest factor (t-value= 2.967), followed by education level and job relevance. Age was not very significant, and gender had no influence at all.

Variable	Estimate	SE	t-value
Intercept	-1.043**	0.285	-3.273
Employee-level predictors			
Age	0.027*	0.012	1.467
Gender	0.015	0.024	0.621
Education level	0.014**	0.076	1.932
ICT Skills	0.066**	0.029	2.967
Work experience	0.012*	0.062	1.632
Job relevance with ICT	0.014*	0.023	1.732
SMME-level predictors			
Computer infrastructure	0.965**	0.850	2.501
Facilitating conditions	1.414*	0.773	1.931
Ease of applications	0.256***	0.502	6.972
Incentive to use ICT	1.425***	0.773	4.531
Performance expectations	-0.245	0.502	-0.173
Internet infrastructure	0.911**	0.291	2.131
Akaike Information Criterion (AIC)	**2,362**		
Explained variance (%)	**0.833**		

Note: *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

Table 4: Results of hierarchical logistic regression model of IS adoption among SMMEs in Kajiado County

At the organization level, the most influencing factor was ease of use of applications, which had a very high significance value (t-value = 6.972). Incentive to use ICT was not very far behind. Performance expectations was not significant. In fact, it was inclining towards negative influence of IS adoption. The model goodness of fit was assessed, and the statistic is low based on the hierarchical sample size (2,362) indicating a good model. The amount of variance explained was very high (about 80%) also agreeing that the analyzed data was properly suited to the designed model.

4.3 Integrated Framework for IS Adoption

The results of the sections above confirms that IS adoption is influenced by both internal and external forces. Employees play an important role in promoting or discouraging IS adoption and people management integrates abilities and capabilities of individuals, their cultures and their personal drives towards information systems. Networking within organizations is also important, as well as organizational capabilities to implement, promote and support IS adoption. The overall framework that can be identified is shown in Figure 8 below based on the results of the modeling in Chapter 3:
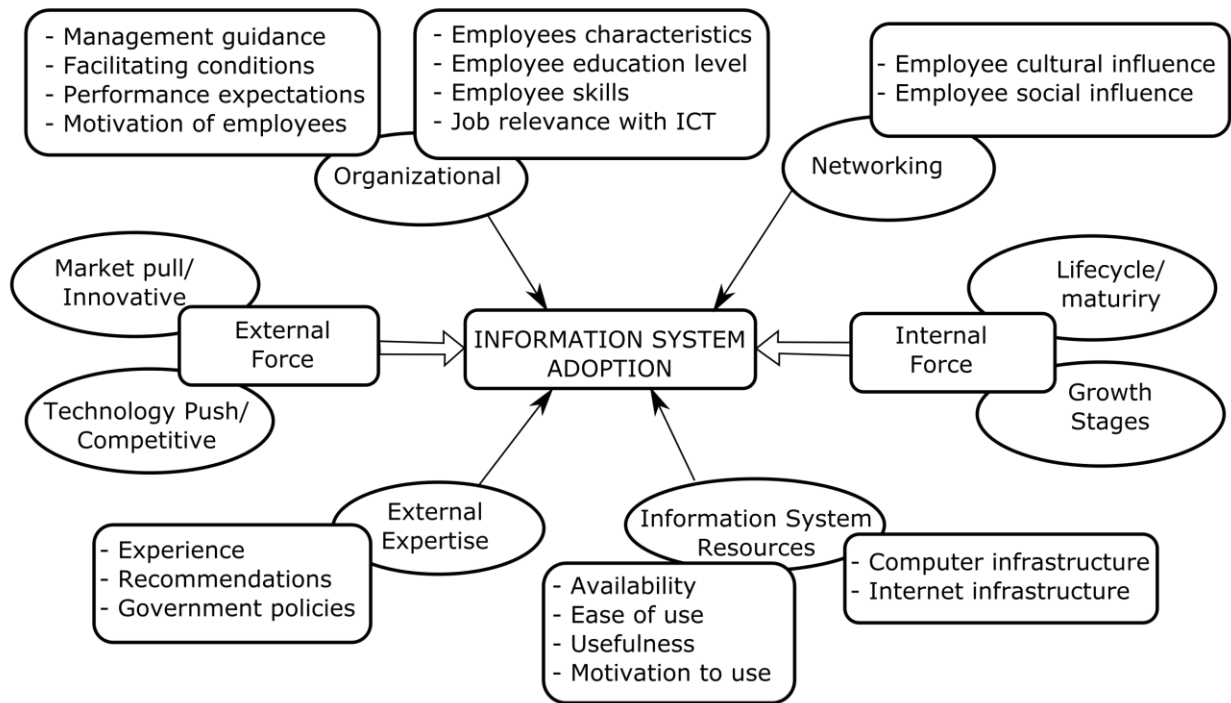
Figure 8: The integrated framework for IS adoption by SMMEs in Kajiado County.

4.4 Conclusion

The general observation from the results of this Chapter is that employees perceive the benefits of IS adoption. If the organizations install proper IS infrastructures and promote adoption of IS tools, technologies and innovations, employees will be easily motivated to adopt them. Such information is very important to starting companies, old companies that wish to implement or expand usage of IS tools and applications, and to the government for supporting and promoting IS practices in business sectors.

CHAPTER FIVE

5.0 Discussion and Conclusion

5.1. Introduction

This Chapter discusses the results from the previous Chapter and assesses the relevance of the results against other previous studies. It examines how the study objectives have been met, how existing gaps have been addressed in this study and the value addition of the study to assessment practices of IS adoption. It also outlines the limitations that were experienced and recommend areas of future investigation.

5.2. Discussion of Results

Fundamentally, the level of mutual trust between employees and managers in organizations is empirically identified as an antecedent of Perceived Usefulness of IS, and in turn an antecedent of attitude. This has some practical implications in enhancing the attitude toward using IS. Companies seeking to establish new IS strategies or to expand usage of existing ones should first develop trust-building and motivational mechanisms for employees in order to attract novice users to accept the systems and applications. After that, Perceived usefulness of IS emerges as an important issue in attracting new users and should be carefully designed in terms of users' requirements to reflect Perceived usefulness of this service. Without an original consideration from trust aspect, a well-designed IS with significant Perceived Usefulness will not well perform in attracting novice users.

This study also revealed that Subjective norms have positive effect on intention. This indicates the relative importance of the social influence on non-users of IS. This finding has

implication for marketers; it indicates that advertisements in media or press play important roles in forming intention toward IS adoption

The ICT user skill was found to influence IS adoption as ICT training and access to latest information rating on the overall SMEs. Therefore the researcher found much association existed between ICT user skills and IS adoption. However, awareness of computer application software of help, the utility of web and social platform and the knowledge of various computer brands demonstrated positive relation to adoption. Therefore it is accredited to the insufficient capital and funds to invest on personnel training within the SMEs to boost employee's skills. This is in agreement with Apulu et al,(2013) in their findings that lack of ICT user skills is one of the issues that are faced SMEs in the use of computers and internet due to lack of training.

The management support also the findings revealed to be affecting adoption of SMEs which enhanced and boost the production, sales volume, increased revenue and performance. In the study IS investment and room for new advanced technologies showed statistical significance on relation to IS adoption. The rest of the indicators for management support on IS adoption proved not significant .This study found also there is constructive relation with IS adoption. There is need for managers to support, invest and implement new innovations. This is concur with the findings of Elbeltagi et al,(2013) in his studies that IS adoption and implementation are based on manager's innovativeness, active participation, experience and knowledge of IS plays a significant role. Therefore, the manager must own a sensible working knowledge on the new technology.

Lu, Liu, Yu and Yao (2003) research supports the findings as they posit that Perceived usefulness defines user's perception that using a specific application improves output and processes. It provides insight into how actual use and intention to use are influenced. Several studies have shown that the adoption of desktops and laptops, the use of e-mails (Limayem etal., 1997), the increase in online business (Limayem et al., 1997) and the adoption of web applications (Chang and Cheung, 2001) depend on their perceived usefulness by users before they adopt them. According to the theory of diffusion of innovations (Rogers, 1995), the diffusion cycle of IS within a population depends on the factors stated earlier in the literature review, including their relative advantage, which means that the individual perceives the new technology as better than the one that it replaced (Davis, 1986).

As the results of the study show, the acceptance of IS is influenced by the perception of their potential users. The more they are convinced that their use is improving their performance, the more they adopt and incorporate them in their work. This theory of the positive impact of perceived usefulness of IS on their use has been verified in many studies (Bukhari, 2008), confirming that perceived usefulness is a determinant of adoption and use of technologies, that the pre-adoption attitude of users is based on the perceptions of the utility of the technology, and that more than sixty percent of the explanatory power of the technology acceptance model is due to the perceived usefulness (Venkatesh et al., 2000).

More recently, King and Marks (2008) showed that the use and adoption of knowledge management systems was feasible only if their users perceive them as useful. Based on this analysis, it is clear that perceived usefulness has a positive effect on adoption behavior of companies in regards to IS. This allows us to conclude that perceived usefulness of IS has a positive influence on the adoption and use of IS.

The study found that education levels correspondents to employee level of adopting new innovation. Beckinsale and Ram (2006) affirm the findings as they conclude that an individual's ability to find sustainable solutions explains why people who are more educated are more willing to adopt and use new technology to improve their work output, and therefore the relationship between education and both ability to learn and attitudes towards IS and innovation suggest that organizations that have implemented and use IS are those that have more highly educated top management team (Sanchez, Martinez-Ruiz, and Jimenez-Zarco, 2007). For organizations to fully benefit from the adoption and use of IS, there also exist a need to invest in capacity building and skills training for their employees.

The study revealed that employee skill and knowledge can be improved by emphasizing the need for education advancements, to the employees and offering incentives for employees to take training and advanced courses to improve their level of education. Harindranath, Dyerson, and Barnes (2008) confirm the results as their research found that a work force that is highly educated is more likely to adopt and implement IS initiatives in the organization.

The result of Fishbein and Ajezen (2005) research on IS adoption in Malaysian SMEs, indicate that 130 out of 180 companies didn't make it a priority to develop training programs for their employees this in turn resulted in employees with no IS skills or knowledge tacking charge of IS initiatives in the companies, which became a hindrance to IS adoption and use.

For researchers, past research on technology acceptance implicitly assumed that the success of a system adoption and use is mainly dependent on technological aspect and does not consider the notion of uncertainty. However, the advent of technology has introduced uncertainty and risk in system acceptance and use because people often need to use the Internet to

communicate, collaborate, and transact with individuals and organizations without physical face-to-face interaction. Thus, uncertainty is increasingly becoming the underlying determinant of the IS usage.

Traditionally, the TAM assessment model mainly focuses on the aspect of system features and thus, is insufficient in capturing the roles of individuals, organizational members, and social system in the Internet-based system usage, in particular, IS. TPB with the antecedents of attitude, perceived behavioral control, and subjective norm will be in a complementary manner to enhance the prediction capability of TAM.

The implication of these findings and conclusions are that, organizations need to play a leading role in influencing the perception, and there by the attitude and behavior of current and potential IS users. The outcome of this study has two practical implication and recommendation for organizations.

5.2.1 Push Strategy

Awareness of IS services is essential in the early adoption stages.

As IS services are still new in Kajiado County, effective presentations using all forms of media advertising such as leaflets, brochures, web pages, etc., will be useful to introduce the services to a wider audience and educate potential customers about the benefits of IS. To access more potential adopters, information about IS should be provided by the workers at different level and departments. The information should include references to "time saving", "convenience" at anywhere any time, "low costs", and "information availability". In addition, organizations should design their web sites as effective delivery channels and offer information beyond the services and products that they are offering. It is essential to provide a well-designed

and user-friendly web site to attract potential adopters' attention. The customer should not be required to expend a lot of effort or time, or undergo too great a change in behavior, to adopt IS services.

Information and instructions on the web should be provided in an understandable language in order to make the adopter comfortable. Wide publicity underscoring the benefits and ease of use by demonstrating IS services should be provided.

Reliability of access when needed is one of the key encouragement factors.

Although this "reliability" partly depends on customers' networks, which were excluded from the study, internet services can enhance accessibility by co-operating with ISPs to provide good quality internet access. Organization should also separate internal and external uses and give priority to external uses. While reliability is a key element from a customer's perspective, so is the security system. It must be enhanced continuously to guarantee integrity of online transactions as this will build customer confidence. Security provisions should be posted on Organizations' web sites clearly and understandably to create customer confidence and improve the trustworthiness reputation of Organizations. Security information should be provided in non-technical terms, and be accompanied by standard security statements.

A perception of quality service will increase the Organization's image for good services, accuracy and effectiveness. Failure of execution not only causes dissatisfaction and uncertainty to the customer but also makes the whole IS process more complex and less comprehensible.

5.2.2 Pull Strategy

Organizations should develop IS diffusion strategies by adopting "pull" strategies.

Increased diffusion will increase the number of IS adopters since they are likely to come from the internet population. Furthermore, support from the government and the industry regulator will positively affect IS services by increasing the confidence of the adopters.

Effective co-operation among Organizations has to be developed. The value of IS is increased by linking one activity with other both within Organizations and with outside suppliers, channels and customers (Porter, 2001). Furthermore, internet Organizations should collaborate with service providers because it will enable Organizations to better control quality of services as well as enhance adopters' accessibility. In addition, a high quality IS infrastructure should be provided since it is one of the primary requirements for application usage.

Support from the government and industry regulator should be effective to increase the growth of IS services. The Kajiado County Government should be encouraged to initiate suitable steps to remove legal and regulatory barriers to ecommerce in general and IS in particular. For example, electronic laws should be promoted by the Organizations in order to reduce customers' perceptions of risks. Current cooperation has been for commercial purposes, rather than for mutual benefit of the industry.

5.3. Achievement of Objectives and Academic Contribution

The adopted study methodology was highly effective, and all of the four specific study objectives have been fully addressed as follows:

Objective 1: *To identify the characteristics and determinants of the adoption of IS among small and medium businesses.*

Objective 2: *To identify the best practice recommendations for designing effective adoption strategies.*

Objective 3: *To design and implement appropriate models for the IS adoption data of Kajiado business sectors.*

Objective 4: *To evaluate the developed model.*

In summary, this study makes significant contributions across all area of IT adoption and usage research and practice. Some key contributions are:

1. The development of a conceptual model that explains and predicts the factors that influence the adoption and acceptance of information technology/ system of the internet; and its application regarding the new technology in the Organization sector in Kajiado, such as IS.

2. The empirical support for proposed hypotheses based on the integrative research framework and the literature;

3. It is potential to be generalized to nation-wide general organizational study

The result is an indication of the good explanatory power of the model for intentions and can be used as a research model for further study on IT adoption.

5.4. Study Limitations

This study was conducted to find the factors influencing intentions to adopt IS services. As such, there is still room for further investigation into the adoption of IS services.

This study has focused on users who are experienced or one-time users of IS. However, prior research has suggested that determinants of behavioral intention change in terms of users' level of experience (McKnight et al., 1998; Karahanna et al., 1999). First, future studies should be carried out on non- Internet users to investigate their adoption intentions of such service. Second, as IS services are still relatively new in Kajiado, this study has been unable to measure the actual usage behavior of such services, which was suggested by the theory of planned behavior (Ajzen, 1985).

Additional research, both longitudinal and cross-sectional, is needed to examine the differences of this framework as users evolving from being aware of the IS, to having experience with the IS services, to being continued use of the IS service.

More research with the alternative conceptualization of trust would be useful in more understanding the role of trust in the initial adoption of on-line service. Gefen presented some factors said to have an impact on trust such as familiarity and disposition to trust. Further research considering these factors could enhance the understanding of organization acceptance of IS.

5.5. Recommendations and Conclusion

Future studies should incorporate this measure once the number of IS customers has reached a critical mass. In this way, a more comprehensive investigation of IS intentions and usage behavior can be conducted. The study on adoption intentions of IS services in Kajiado can be

extended to all levels of business. Comparison can then be made between small businesses and large business in terms of the factors influencing their adoption decisions, the criteria for selecting an IS service, and the types of products and services perceived to be useful.

More research should focus on further testing and refinement of the new model to establish its external validity as well as testing whether the study findings results can be replicated in other contexts such as different technologies or economic sector. It is currently unknown how well the model and its findings will generalize beyond the specific conditions of this study.

Future research should include a thorough testing of the proposed research model variables to determine whether the conceptual model proposed receives further empirical support.

The County government of Kajiado, in collaboration with possible development partners strategize on how to cut the cost of backbone IS infrastructure, which in return will lower the cost of purchasing IS components. With the current dispensation of devolved government structure where counties are putting heavy premium on developing their counties, the county government of Kajiado should hold seminars to educate traders on the merits of embracing IS in running all small organizations. The county government can also partner with Microsoft and other ICT accredited training centers to offer skills training for SME owners at subsidized rates. The study therefore recommends that county governments should come up with policies that encourage and support computerization of managerial functions for micro and SMEs.

REFERENCES

Feder, M., & Pfeffermann, D. (2015). Statistical inference under non-ignorable sampling and non-response. An empirical likelihood approach.

Al-Adawi, Z., S. Yousafzai, and J. Pallister. (2005) Conceptual model of citizen adoption of e-government. Citeseer

Creswell, J. W. (2012). Qualitative inquiry and research design: Choosing among five traditions (3rd Ed.). Thousand Oaks, C.A: Corwin press

Pilat, D. and F.C. Lee (2001), Productivity Growth in ICT Producing and ICT-Using Industries: A Source of Growth Differentials in the OECD?, STI Working Papers 2001/4, OECD: Paris.

Punch, K. F. (2005). Introduction to social research: Quantitative and qualitative approaches: Sage Publications Ltd.

Wang, C.-C. and Fang, S.-K.L.W. (2008). Extending the Technology Acceptance Model to Mobile Telecommunication Innovation: The Existence of Network Externalities. Journal of Consumer Behaviour, 7(2): 101-110.

Premkumar, G. A. (2003) meta-analysis of research on information technology implementation in small organizations. J. Org. Comp. Elect. Com, 13, 91–121.

Morris, M. G. and Dhillon, T., (1997). How user perceptions influence software use. IEEE software. 14:58-65

Macgregor, R.C.; Vrazalic, L. (2005) A basic model of electronic commerce adoption barriers: A study of regional small organizations in Sweden and Australia. J. Small Bus. Enterp. Dev, 12, 510–527.

Riquelme, H. Commercial, (2002) Internet adoption in China: Comparing the experience of small, medium and large organizations. Internet Res. 12, 276–286.

Saunders, M. Lewis, P. and Thohnhill, A. (2007) Research Methods for Organizations

Venkatesh, V., Morris, M.G., Davis, G.B., and Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27 (3), 425-478.

Wang, Y. S. and Shih, Y. W., (2009). Why do people use information kiosks? A validation of the Unified Theory of Acceptance and Use of Technology. Government Information Quarterly, 26(1), 158-165.

Muinde, F.N. (2010). Investigation of Factors Affecting the Adoption of Information and Communication Technologies for Communication of Research Output in Research

Institutions in Kenya. Available http://hdl.handle.net/10063/1417

Krotov, V., Ives, B. (2011): ERP Implementation Gone Terribly Wrong: The Case of Natural Springs. Commun. Assoc. Inf. Syst. 28, 277–282.

Fadel, K. (2012): User Adaptation and Infusion of Information Systems. J. Comput. Inf. Syst. 52, 1–10.

Wen, C., Remus, U., Mills, A. (2011): Understanding and addressing user resistance to IS implementation in a lean context. Proceedings of the 19th European Conference on Information Systems, Paper 171. , Helsinki, Finnland.

Ramiller, N. (2013): Reconsidering Resistance in the Post-Human Era. Proceesdings of the 19th Americas Conference on Information Systems. pp. 1–7. , Chicago, USA.

Elie-Dit-Cosaque, C.M., Straub, D.W. (2011): Opening the black box of system usage: user adaptation to disruptive IT. Eur. J. Inf. Syst. 20, 589–607.

Hsieh, J.J.P. -a. P.-A., Rai, A., Xu, S.X. (2011): Extracting Business Value from IT: A Sensemaking Perspective of Post-Adoptive Use. Manage. Sci. 57, 2018–2039.

Sykes, T., Venkatesh, V., Gosain, S(2009).: Model of acceptance with peer support: A social network perspective to understand employees' system use. MIS Q. 33, 371–393.

Lee, H., Sawyer, S. (2010): Conceptualizing time, space and computing for work and organizing. Time Soc. 19, 293–317.

Wynn, D., Williams, C. (2012): Principles for Conducting Critical Realist Case Study Research in Information Systems. MIS Q. 36, 787–810.

Lewis, M.O., Mathiassen, L., Rai, A. (2011): Scalable growth in IT-enabled service provisioning: a sensemaking perspective. Eur. J. Inf. Syst. 20, 285–302.

Mueller, B., Urbach, N. (2013): The Why, What, And How of Theories in IS Research. Proceedings of the 34th International Conference on Information Systems. , Milan, Italy.

Bradley, J. (2012): If We Build It They Will Come? The Technology Acceptance Model. Information Systems Theory. pp. 19–36. Springer, Berlin, Heidelberg.

Beaudry, A., Pinsonneault, A. (2010): The other side of acceptance: studying the direct and indirect effects of emotions on information technology use. MIS Q. 34, 689–710

Sun, H. (2012): Understanding User Revisions When Using Information System Features: Adaptive System Use and Triggers. MIS Q. 36, 453–478.

Burton-Jones, A., Grange, C.: From Use to Effective Use: A Representation Theory Perspective. Inf. Syst. Res. 24, 632–658 (2013).

Wong, D. H., Yap, K. B., Turner, B., & Rexha, N. (2011). Predicting the Diffusion Pattern of Internet-Based Communication. Journal of Internet Business Applications Using Bass Model Parameter Estimates for Email(9), 26-50.

Martins, C., Oliveira, T., & Popovič, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. International Journal of Information Management, 34(1), 1-13.

Munusamy, J., De Run, E. C., Chelliah, S., & Annamalah, S. (2013). Adoption of retail internet banking: A study of demographic factors.

Hu, S. (2007). Akaike information criterion. Center for Research in Scientific Computation, 93.

Appendix 1: Questionnaire

Questionnaire

What is your gender?

1. How do you classify your organization?
   Retail
   Education
   Manufacturing
   Other _____

2. What is your gender?
   Male ☐   Female ☐

3. What is your age bracket?
   18 to 25 years ☐   26 to 35 years ☐
   36 to 45 years ☐   Above 46 years ☐

4. What is your highest level of formal education?
   University degree ☐   Diploma ☐
   Technical/ vocation ☐   Secondary school ☐
   Other _____

5. How long have you been employed in your current organization?
   Less than 1 year ☐   2 to 5 years ☐
   6 to 9 years ☐   10 years and above ☐
   Others: _____

6. What is the current size of your team of employees?
   1 to 100 ☐   101 to 200 ☐   Over 200 ☐

7. Do you use or plan to use IS tools , PC, mobile, network cloud etc? (yes/no)

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

8. Do you use IS tools mostly for business? (Yes/No)

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

9. Would you use additional IS tools if provided for business? (Yes/No)

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

10. Are you currently seeking new IS tools to use?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

11. Does your organization management encourage you to use IS?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

12. Are you satisfied with the current IS functionality and capability?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

13. Does the IS support the necessary task that you have to do?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

14. Do you consider IS adoption as a driver for department/organization growth?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

15. How frequent do you require technical support?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

16. Do you require annual retraining on IS tools used?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

17. Are your current IS tools easy to navigate?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

18. Is the time taken to access /retrieve records minimal?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

19. Is the initial training of new users short?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

20. Do you have a network of peers that use similar IS tools?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

21. Does your organization have a culture of openness to adopt new IS tools?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

22. Does your IT department that leads in IS integration?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

23. Does your management team possess IS skills?

Strongly Agree	☐
Agree	☐

Average	☐
Disagree	☐
Strongly Disagree	☐

24. Do you use IS tools frequently in a day?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

25. Do you use IS tools mostly for basic operations?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

26. Are most company employees mandated to use IS?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

27. Do you use IS tools mostly for communication purposes?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

28. Does your department or your organization heavily relies on IS?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

29. Do you regularly explore new IS tools to support your tasks?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

30. Do you apply current IS to solve complex organizational challenges?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

31. Do you support your teammates who face challenges using current IS tools?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐

32. Are you willing to support use of new IS if adopted?

Strongly Agree	☐
Agree	☐
Average	☐
Disagree	☐
Strongly Disagree	☐