UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

TITLE: A FRAMEWORK FOR THE ADOPTION OF COMPUTER ASSISTED MEDICAL DIAGNOSIS SYSTEMS BY MEDICAL DOCTORS IN KENYA

By

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Submitted in partial fulfillment of the requirements of the Masters of Computer Science in Information Systems

DECLARATION

This research project being presented is my original work and has not been published for the award of any university degree.

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Collins Edwin Opiyo Ouko Date

This research project is submitted as partial fulfillment for the degree of Masters of Science in Information systems with my approval as the university supervisor.

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DEDICATION

I dedicate this project to my late parents Mr Henry B Ouko and Mrs Anastacia O Ouko who nurtured me on how great education is.

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I acknowledge the tireless effort by my supervisor Mr Evans K Miriti who encouraged me and guided me for the relevant materials to make this project a success. I also would like to thank the panelist Professor Wagacha, Professor Waema, Mr Samuel Ruhiu and Mr Christopher Moturi who criticized me positively and helped me to complete this project.

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ABSTRACT

Information systems have great potential to reduce healthcare costs and improve outcomes. Accessing information about services on-line and carrying out a range of transactions electronically are still not fully accepted.

Healthcare delivery is being transformed by advances in computer assisted medical diagnostic (CAMD) systems which are now recognized as an essential enabler for support of health systems across the world.

There has been a growing need for research on factors influencing adoption of CAMD systems all over the world and especially in Kenya.

This research examined factors influencing adoption of CAMD systems among medical doctors in Kenya. The study aimed to examine the effect of adoption of CAMD systems in Kenya from a doctor's perspective. It examined the effect of the rapid penetration of internet use, conducive legal, regulatory, and infrastructural environments on adoption and use of CAMD systems. It examines how doctors find these systems useful in assisting them carry out the correct diagnoses in complex situations and prompt diagnoses for that matter.

This project develops a theoretical framework and proposes that; Perceived Usefulness, Perceived Ease of Use, Perceived information quality, Perceive Trust, Security, Awareness, ICT Skills and savings/costs as the constructs and investigates the moderating factors of Specialty, gender and Age on how they influence these constructs to the adoption motivation. The project aimed at selecting a suitable framework that would realize implementation and adoption of CAMD systems in Kenya.

Keywords: Healthcare; computer assisted medical diagnostic systems; adoption; framework of adoption.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

CAMD ………… Computer Assisted Medical Diagnostic

CVD …………….. Cardiovascular disease

DARE …………… Deep Anatomical REasoner

ESTEEM ……….. European Standardized Telematics Tool to Evaluate EMG knowledge- based systems and methods

GP ……………….. General Practitioner

KBS ……………… Knowledge Based Systems

PBC ……………. Theory of Planned Behaviorg

QMR …………….. Quick Medical Record

TAM …………… The Technology Adoption Model

TRA …………… Theory of Reasoned Action

UTAUT…………Unified Theory of Acceptance and Use of Technology

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

The term medical diagnostic system is widely used by many individuals, health institutions, and professional bodies. According to Nazi Kim M (2003), medical diagnostic systems offers the rich potential of supplementing traditional delivery of services and channels of communication in ways that extend the healthcare organization's ability to meet the needs of its doctors. Benefits include enhanced access to information and resources, empowerment of doctors to make informed healthcare decisions, streamlined organizational processes and transactions, and improved quality, value, and patient satisfaction. Also Nazi Kim M (2003), states that medical diagnostic systems are now recognized as a key enabler for supporting health systems the world over as they strive to deliver good health to citizens in the face of growing difficulty. Medical diagnostics systems thus acts not only as an agent for reforming healthcare systems (from an infrastructure focused healthcare service into a more dispersed healthcare model), but also as an enabling tool for countries with similar challenges to share resources across international borders and domestic boundaries, thus providing quality without the expense of needless duplication. The medical diagnostic systems will enhance tracking of prevalent diseases and monitor distribution of drugs and other supplies. It will also improve quality and efficiency of disease surveillance, enhancing protection and prevention by making processes such as malaria and HIV testing fast and easy. According to C. Shirky (1998), Swift communication once disease is detected will ensure quick administering of treatment.

The project examines the effect of an educated and entrepreneurial populace, and conducive legal, regulatory, and infrastructural environments on adoption of use of computer assisted medical diagnostic systems.

From the WHO conference in Bellagio Italy (2008), healthcare delivery is being transformed by advances in medical diagnostic systems and by the empowered, computer-literate doctors. According to Pagliari C. et al (2005), such changes can affect positive results like improved clinical decision-making, increased efficiency, and strengthened communication between physicians and patients. In general CAMD systems are inevitable and ways of their smooth adoption are a major concern to the general doctor’s fraternity as a whole. This project focuses mostly on designing a framework for the adoption of CAMD systems.

Medical diagnosis or the actual process of making a diagnosis is a cognitive process. A clinician uses several sources of data and puts the pieces of the puzzle together to make a diagnostic impression. The initial diagnostic impression can be a broad term describing a category of diseases instead of a specific disease or condition. According to Lemaire et al (1999), the best clinicians excel in their ability to discern the correct diagnosis in perplexing cases. This skill requires extensive knowledge base, keen interviewing and examination skills, and the ability to synthesize coherently all of the available information. Unfortunately the level of expertise varies among clinicians and even the most expert can sometime fail. For these reasons clinicians are well advised to explore tools that can help them establish correct diagnoses, thus CAMD systems. Examples of such systems that are already so much utilized the world over are Iliad- University of Utah; DXplain- Massachusetts General Hospital, Boston, MA, Medline and Netdoctor in United Kingdom.

In New Zealand, a national survey of general practitioners (GPs) conducted in 1999 showed that while most GPs used cardiovascular disease (CVD) risk tools, 70 percent used them about once a month or less. A web-based clinical decision support system, known as PREDICT-CVD was designed and developed collaboratively to facilitate CVD risk assessment and risk based management whilst also integrating CVD risk prediction research within routine practice. The collaboration included epidemiologists from The University of Auckland, Information Technology specialists from Enigma Publishing Ltd (a private provider of online health knowledge management) and clinicians and support staff from ProCare Health Limited, Counties Manukau District Health Board, New Zealand Guidelines Group, National Heart Foundation and the Ministry of Health. The roll-out of PREDICT-CVD was supported by educational seminars to general practice continuing medical education groups. Adoption of the program was encouraged but entirely voluntary. GPs were also offered $900 including tax per GP as a one-off incentive payment once they had assessed 90 patients. As few GPs at the time had the high speed internet connection required for PREDICT, this money was provided to cover the cost of installation of secure high speed web access and the user charges for three months. GPs who had eligible patient management systems and who chose to adopt PREDICT-CVD were visited by practice facilitators who installed the software, ensured safe connectivity to the Internet and provided limited training to the primary care team, Wells' S and Jackson R, 2005. This is just a highlight of effort the New Zealand government has put in place to ensure adoption of the PREDICT-CVD system.

In Kenya, there have been various local CAMD systems that have come up but have experienced slow adoption. An example is www.kenyandoctors.com. This was formed by former Nairobi university medical doctors. The patients would login at a fee input there symptoms then they would get a feedback within 24hours. Another one was safaricom's "call a doc" that has recently been introduced. All these systems have experience slow adoption necessitating intervention in the form of a framework to ensure adoption of such systems.

The "acid" test for CAMD systems is whether they are perceived to be useful enough to be adopted and, once adopted, whether the ease of use and fit with clinical work flow is enough to change clinical behavior. To achieve sustainable usage, the benefits to individual clinicians must outweigh the time and effort to use it. Heeks et al (2006).

The study focused on preparing a framework for adoption of medical diagnostic systems that will facilitate adoption of these systems in a highly integrated and geographically dispersed medical provision. The objective was to provide a way that would make utilization of these medical diagnostic systems appreciated and embraced.

1.2 Problem Statement

Computer Assisted Medical diagnostic systems, both web based and non-web based are continuously being developed. At the moment there are over a thousand CAMD systems, Ramnarayan P, Roberts G, Coren M (2006). The health issues has been taken with great concern and effort has been made to ensure the best medical care is provided and hence the development of these CAMD systems.

In Europe and other parts of the world the governments are taking the front row in adoption of these CAMD systems, case of PREDICT-CVD system in New Zealand, by ensuring that there are frameworks for adoption and a lot of awareness creation.

A study conducted by (Neale G et al, 2001), on admissions to British hospitals reported that 6% of the admitting diagnoses were incorrect. The emergency department requires complex decision making in settings of above-average uncertainty and stress. The rate of diagnostic error in this arena ranges from 0.6% to 12%, (O'Connor P M et al, 1995 and Chellis M et al, 2001). Based on his lifelong experience studying diagnostic decision making, (Elstein A S, 1995) estimated that the rate of diagnostic error in clinical medicine was approximately 15%. Computer-based methods are increasingly used to improve the quality of medical services. Mostly the remote areas, the population are deprived of the facilities of having experts to diagnose disease. So it is the need of the day to store the expertise of specialists in computers through using ES technology.

Kenyans are lagging behind in the adoption of these CAMD systems as testified by the medical doctors on the low level of awareness creation. From WHO (2011) report, diabetes and cancer were identified as diseases which are now taking over HIV as being number one killer diseases in Kenya. Some of these diagnostic systems have been designed to diagnose such diseases in good time.

This study addresses issues that will enhance the acceptance of these medical diagnostic systems in health institutions. It suggests a suitable technology framework and identifies gaps that may be and suggests ways to mitigate these gaps in order to encourage adoption of medical diagnostic systems. According to Lemaire et al (1999), the best clinicians excel in their ability to discern the correct diagnosis in perplexing cases. This skill requires extensive knowledge base, keen interviewing and examination skills, and the ability to synthesize coherently all of the available information. Unfortunately the level of expertise varies among clinicians and even the most expert can sometime fail. For these reasons clinicians are well advised to explore tools that can help them establish correct diagnoses, thus CAMD systems.

1.3 GENERAL OBJECTIVE

The purpose of the study was to assess the extent of adoption and the factors facilitating or hindering adoption of CAMD systems in Kenya.

1.3.1 Specific Objectives

The specific objectives are to:

1. Analyze different technology adoption frameworks used for adoption of computer assisted medical diagnosis systems or technology in the different parts of the world.
2. Select a suitable framework and customize it if there is need to be used for the study of adoption of computer assisted medical diagnosis systems in Kenya
3. Validate the framework

1.4 Research questions

In order to attain the above outlined objectives, this study shall endeavor to answer the following questions:

1. What are the frameworks used for adoption of computer assisted medical diagnostic systems or technology?
2. Which is the most appropriate to study the adoption of computer assisted medical diagnostic systems and the gaps that maybe in it?
3. What factors influence the adoption of computer assisted medical diagnostic systems in Kenya?

1.5 Significance of the study

It is not obvious that a CAMD system, even when perceived in other areas to be so helpful will be adopted as is expected. The study tries to find out what factors may be a hindrance to the adoption of such systems that are created to enhance provision of quick and quality health care but in return receive slow pace utilization.

The overall beneficiary of the study are the general practitioners who will be able to gauge the trend of infection in an easier way thus make more informed decisions; the patients who will now be more closely involved in his health issues; and the government which will now be able to plan for provision of health facilities in a more informed way.

Table 1: A summary of key stakeholders of a medical diagnostic system

Stake Holders	Needs, Wants & Expectations
Physicians and Other Care Givers	Improved clinical outcomes, improved diagnosis and treatment
Patients	Improved patients' experience, improved physiological well-being, reduced waiting time, reduced delay
Organizations	Enhanced efficiency of internal operations, cost containment, increased productivity and quality and outcomes improvement
Regulatory Agencies / insurance companies	Reduced risks and improved patient safety
The Government	improved health provision outcomes

1.6 scope of the study

The study was carried out in a few selected hospitals with a specific focus on specialists who are expected to be the major users of these CAMD systems, that is purposive sampling was done. Only doctors were interviewed, although other clinicians use these systems, because the study was investigating if the specialty of a doctor would influence there adoption of these systems and also because they are the ones who are mostly involved in carrying out diagnoses. Also there were interviews with ministry of public works and sanitation officials to gather the level of adoption of CAMD systems and the efforts that the government has put in place to emphasis adoption of such systems.

1.7 Assumptions and limitations of the research

1.7.1 Basic assumption

The key players in the health sector, that is the ministry of health officials and the doctors on the ground, were consulted and it was assumed that there was no framework for adoption of computer assisted medical diagnostic systems.

The study assumed that there would be full cooperation from the doctors who were intended to fill in the questionnaire which was not the case as most of them were very busy and constant follow up had to be made to get feedback.

The study assumed that these systems are mostly used by doctors to assist them in carrying out diagnoses and other clinicians only use them for reference and not diagnoses as such.

1.8 Definitions of important terms

Healthcare; is the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in humans.

Computer Assisted Medical diagnostic systems; are interactive computer programs designed to assist health professionals with decision-making tasks

Adoption; it is the acceptance and usage, in this case a medical diagnostic system.

Framework of adoption; a format that provides guidance for acceptance, in this case a medical diagnostic system

CHAPTER TWO: LITERATURE REVIEW

2.1 Concept of user acceptance

User acceptance is defined as the demonstrable willingness within a user group to employ information technology for the tasks it is designed to support. Thus the concept is not being applied to situations in which users claim they will employ it without providing evidence of use, or to the use of technology for purposes unintended by the designers or procurers (e.g. use of internet to access medical information). Of course there will always be a slight deviation from idealized, planned usage but the essence for acceptance theory is that such deviations are not significant, i.e. the process of user acceptance of any ICT tool for intended purposes can be modeled and predicted Dillon A and Morris M (1996).

2.2 Technology adoption

The process by which an organization adopts and implements technological innovations is influenced by the technological context, the organizational context and the environmental context, Tornatzky & Fleischer, (1990).

Tornatzky & Fleischer (1990), go on to explain that, the technological context includes the internet and external technologies that are relevant to the firm. Technologies may include both equipment as well as processes. The organizational context refers to the characteristics and resource of the firm including the firm's size, degree of centralization, degree of formalization, managerial structure, human resources, amount of slack resource and linkages among employees. The environmental context includes the size and structure of the industry, the firm's competitors, the macroeconomic content and the regulatory environment.

2.3 Computer assisted Medical diagnostic systems

Computer Assisted Medical diagnostic systems are interactive computer programs designed to assist health professionals with decision-making tasks. The development of computer systems like CASNET (Weiss S M et al, 1978), INTERNIST (Miller, Pople & Myers), CADUCEUS (Blois, 1980), and MYCIN and ONCONIN (Shortliffe, 1976) for diagnosing diseases, managing treatments, consulting or explaining has progressed rapidly, and more comprehensive disease diagnostic systems like DXplain (Barnett, et al. 1987) and INTERNIST-1/QMR (Miller, et al. 1982) have evolved. Most CAMD systems today are limited in scope to a few related diseases or only one disease. The clinician interacts with the software utilizing both the clinician's knowledge and the software to make a better analysis of the patient's data than either human or software could make on their own. Typically the system makes suggestions for the clinician to look through and the clinician picks useful information and removes erroneous suggestions. The traditional development of knowledge based systems (KBS) is focused on solving an actual problem in some local environment. This is used to be the initial motive. Knowledge representation therefore, used to be biased towards the data that is used locally, and the development of the reasoning (e.g. diagnostic, therapeutic, etc.), usually considered the hard and daring part, is based on and is often optimized for this local representation of knowledge. Concepts change from place to place and not only in naming. The transferability of knowledge is not a matter of simple conversion of names, as local concepts spread from the representation of knowledge and has important consequences in the reasoning process, White C et al (2002). E health and specifically CAMD systems for this case needs to be interoperable.

CAMD systems can either be web based or not. According to (Chellis M et al, 2001), five specific methods for projecting a diagnosis are Expert Rule Based, Bayesian, Statistical, Neural Networks, and Decision Trees. In the late fifties, Ledley and Lusted (1959) suggested that the decision process for arriving at a medical diagnosis could be modeled using a medical combination of symbolic logic and conditional probability methods. Barnett (1982) pointed out that computer programs for medical diagnosis had "the greatest potential when the clinical problem is relatively well defined and structured and when only a limited number of diseases need to be considered." Yet, five years later Barnett et al. (1987) wrote the introductory article for DXplain, a Computer Assisted Medical Diagnosis (CAMD) system that included over 2,000 diseases and 4,700 signs and symptoms with a knowledge base that specified more than 65,000 relationships among them.
General CAMD Functions and Methods Shortliffe's review of medical decision-support systems (1987) listed three functions of such systems; a) Information management, b) Focus attention by flagging abnormal values, explaining possible abnormalities, or alerting possible drug interactions, c) Patient specific consultation and assessment. Although assisting in making a diagnosis and identifying appropriate treatments or tests are two functions that are often incorporated together, many CAMD systems include only one of these functions. CAMD systems obtain information either; a) actively, by monitoring medical devices or medical records to give warnings, advice, or report on conditions, or b) passively, by waiting for sign and symptom inputs. Most CAMD systems are passive data systems that either make suggestions or critique the information or decisions that are entered. The CAMD systems also differ in Human Factors areas, which include ease of use, reliability of computer system, ease of entering information (mode and length process), and the degree to which displays are informative and easily read.

An example of a web based system is the DARE system and the others operate in a similar way, they include QMR—First Databank, Inc, CA; Iliad—University of Utah; DXplain to mention just but a few. The DARE (Deep Anatomical REasoner) system was created in the ESTEEM telematics environment. The ESTEEM environment is an effort for the integration in a telematics environment (European Standardized Telematic Tool to Evaluate EMG knowledge-based systems and methods). The DARE is a

Decision Support System for the Diagnosis of Neuromuscular Diseases, S. Vingtoft et al (1994). One of the main reasons for the multitude of KBS developed in the medical domain of neuromuscular diseases is the fact that, in spite of its complexity, it is a relatively well structured domain. Several systems explore these characteristics of the domain knowledge implicitly, reasoning by inference rules that capture directly the heuristic medical knowledge.

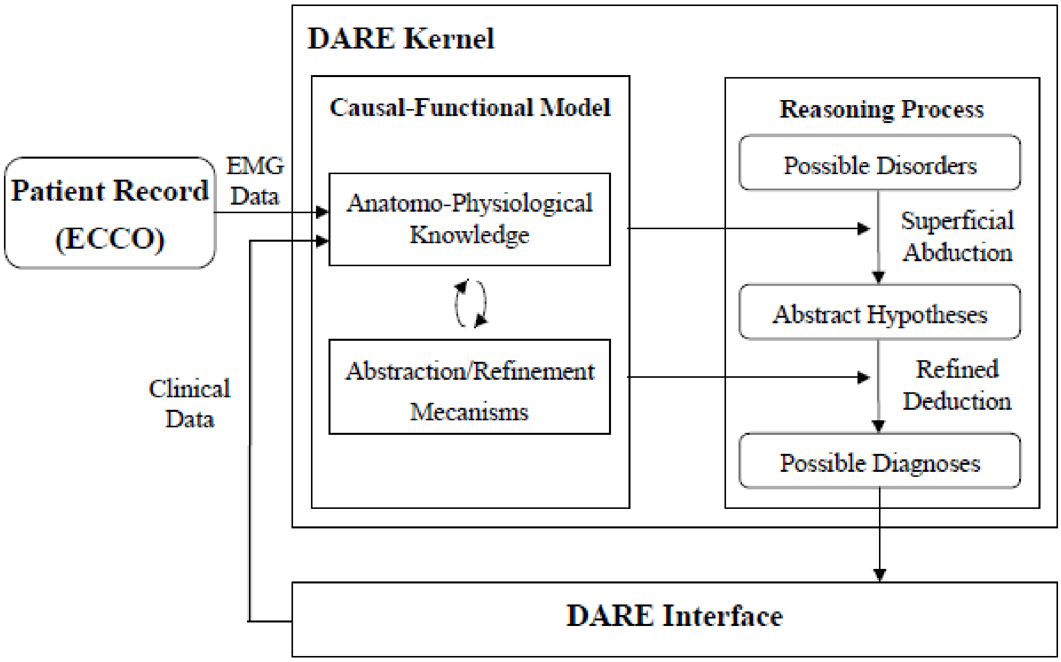


Figure 1: The DARE decision support system

Source: ESTEEM project (AIM A-2010).

The system executes its reasoning in two phases. In the first, it explores the basic anatomical properties of the problem. The system performs a superficial abductive search to elicit abstract hypotheses that can offer reasonable explanations for all the observations. The main goal is to use the anatomical relations, defined explicitly in the model, in order to restrict the large number of initial possibilities and elicit abstract diagnostic hypotheses (e.g. local lesion of median nerve somewhere between the palm and elbow). In a second phase, each of these hypotheses is refined (e.g. local lesion of the median at wrist with moderate severity), the structural states of the examined structures as well as predicted observations are deduced. A comparison between these predicted results and the observation results is then used to evaluate the plausibility of each hypothesis as an explanation for the observations made. In this second phase, the main goal is to evaluate each of the suggested hypotheses in the light of the new physiological knowledge added by the above refinement.

The way the system behaves in order to obtain the possible diagnoses from a specific patient data set, presents some similarities with the anatomical reasoning performed in clinical practice. Initially, the information about the patient is interpreted in terms of anatomy and physiology, DARE Kernel Causal-Functional Model Anatomo-Physiological Knowledge Knowledge Abstraction/Refinement Mechanisms Reasoning Process Superficial Abduction Possible Disorders Refined Deduction Abstract Hypotheses Possible Diagnoses DARE Interface Patient Record (ECCO) Clinical Data EMG Data whereby some anatomical states are identified. Then, anatomical diagnostic hypotheses are suggested and analyzed. At present DARE is able to suggest from partial data (clinical and EMG) the possible diagnostic alternatives, and the planning of further tests can be conducted in order to differentiate between these alternatives or to increase the support of a preferred hypothesis.

The current version of the DARE system is very promising and has already achieved a quite acceptable diagnostic performance and it is being improved on. The overall goal of it developers is to make the system available worldwide, as a server in the global network. It is not prudent for aspects that affect us not to be considered while such a system is being modified.

2.4 Technology Adoption Frameworks

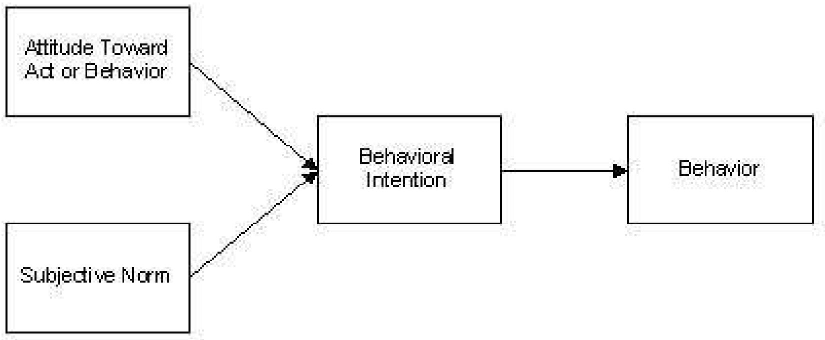
There are various frameworks that can be used as a base for developing a medical diagnostic adoption framework but since the main enabler for these systems is technology, the base models usually comes from technology adoption studies. Among these models, Unified Theory of Acceptance and Use of Technology (UTAUT), Venkatesh, Morris and Davis (2000) is the most prominent example. Other models such as Technology Adoption Model, Davis (1989) theory of reasoned action (TRA) and theory of planned behavior (PBC) also exists.

A combination of best model and other new dimensions of ‘Awareness’, ‘cost/saving’, ‘trust’, ‘ICT skills and Experience’, ‘User satisfaction’ and ‘perceived quality’ should also be considered.

2.4.1 Theory of reasoned action (TRA)

TRA posits that individual behavior is driven by behavioral intentions where behavioral intentions are a function of an individual's attitude toward the behavior and subjective norms surrounding the performance of the behavior. Attitude toward the behavior is defined as the individual's positive or negative feelings about performing a behavior. It is determined through an assessment of one's beliefs regarding the consequences arising from a behavior and an evaluation of the desirability of these consequences. Formally, overall attitude can be assessed as the sum of the individual consequence x desirability assessments for all expected consequences of the behavior. Are the users having a positive attitude on the utilization of medical diagnostic systems? Subjective norm is defined as an individual's perception of whether people important to the individual think the behavior should be performed. The contribution of the opinion of any given referent is weighted by the motivation that an individual has to comply with the wishes of that referent. Hence, overall subjective norm can be expressed as the sum of the individual perception x motivation assessments for all relevant referents. Algebraically TRA can be represented as $B \approx BI = w1AB + w2SN$ where B is behavior, BI is behavioral intention, AB is attitude toward behavior, SN is subjective norm, and w1 and w2 are weights representing the importance of each term.

Figure 2: diagrammatic representation of theory of reasoned action



Source: Fishbein, M., & Ajzen, I. (1975).

The model has some limitations including a significant risk of confounding between attitudes and norms since attitudes can often be reframed as norms and vice versa. A second limitation is the assumption that when someone forms an intention to act, they will be free to act without limitation. In practice, constraints such as limited ability, time, environmental or organizational limits, and unconscious habits will limit the freedom to act.

2.4.2 Theory of planned behavior (PBC)

The TPB Ajzen (1991) extends the TRA by adding perceived behavioral control (PBC) as a variable that affects the intention towards behavior. The rationale behind the addition of PBC was that it would allow prediction of behaviors that were not under complete volitional control. The relative importance of attitude, subjective norm (SN), and PBC in the prediction of intention is expected to vary across behaviors and situations Ajzen (2002). It is inferred from this explanation that the level of relationship between dependent variables (attitude, SN and PBC) and intention changes due to behavior

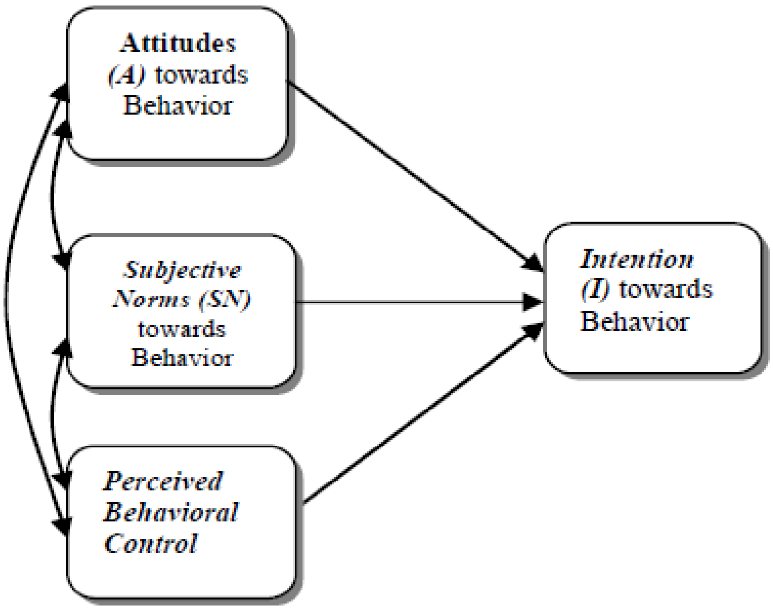


Figure 3: Theory of Planned Behavior, (Ajzen, 1985, 2002)

Chang (1998) claimed that PBC is a better predictor of behavioral intention than attitude, and TPB is better than TRA in predicting unethical behavior. The results of the study Hansen et al. (2004) that tested and compared the ability of the TRA and TPB in predicting consumer online grocery buying intention suggest that the TPB (with the inclusion of a path from SN to attitude) provides the best fit to the data and explains the highest proportion of variation in online grocery buying intention. Tan W et al (2009) found that TRA-based study shows a severe limitation in the ability of the intention to predict actual knowledge sharing behaviors. However, three variations of TPB-based models in their study show that, although the independent variables give satisfactory explanations of variance in intention (R2 > 42%), the intention–behavior gap still exists in each of the three models. Ryu et al. (2003) stated that the TPB model appeared to be superior to the TRA in explaining physicians' intention to share knowledge. Within the context of technology adoption, PBC relates to the individual's perception of the accessibility of IT and to the opportunities for its usage, and to an individual's self-confidence in his or her ability to use IT effectively Baker et al. (2007)

2.4.3 The technology acceptance model (TAM)

The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably:

•	Perceived usefulness (PU) - This was defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance".
•	Perceived ease-of-use (PEOU) - Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" Davis (1989).

TAM is one of the most influential extensions of Ajzen and Fishbein's theory of reasoned action (TRA) in the literature. The goal of TAM is "to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computer technologies and user populations while at the same time being both prudent and theoretically justified", (Davis 1989). It was developed by Fred Davis and Richard Bagozzi (Davis 1989, Bagozzi,). TAM replaces many of TRA's attitude measures with the two technology acceptance measures— ease of use, and usefulness.

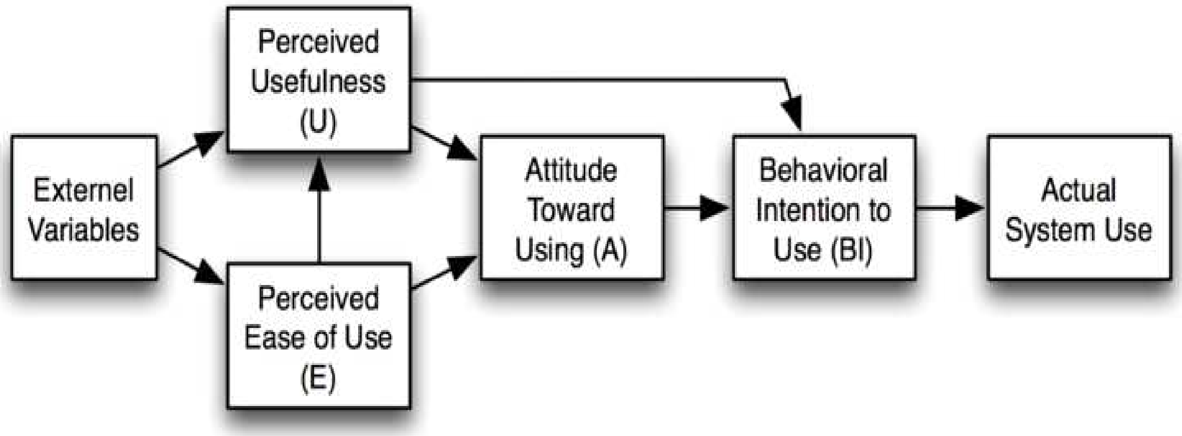


Figure 4: diagram representation of technology acceptance model

2.4.4 Unified Theory of Acceptance and Use of Technology (UTAUT) Model

Venkatesh, Morris and Davis (2000) created an integrated model called Unified Theory of Acceptance and Use of Technology (UTAUT), in which models previously used in the information technology literature were merged. The UTAUT is made of eight theoretical models: TRA, TAM, the motivational model, the theory of planned behavior (TPB), a model combining the TAM & TPB, the model of PBC utilization, the innovation diffusion theory & the social cognitive theory. UTAUT helps managers assess the likelihood of success for new technologies as well as understand the drivers of technology acceptance. The UTAUT model identifies the determinants of user acceptance and usage behavior. Accordingly, there are four core determinants of intention to use and usage of the technology. Three are direct determinants of intention to use technology namely performance expectancy, effort expectancy and social influence while intention to use and facilitating conditions are two direct determinants of usage behavior. They also identified four moderators of these key relationships namely gender, age, experience and voluntariness of use.

In this research we investigate the three determinants of intention to use and moderating factors of gender, age and specialty.

Performance expectancy is the extent to which the users believe that medical diagnostic systems services will enhance their diagnosis efficiency while effort expectancy refers to the degree of ease with which user's access the medical diagnostic systems. There seem to be similarities among the construct of performance expectancy and the perceived usefulness of TAM (Davis 1989), perceived information quality (Venkatesh et al, 2003) and user satisfaction (Venkatesh et al, 2003). Also there seem to be similarities among the constructs of effort expectancy and perceived ease of use of TAM (Davis 1989) and ICT skills and experience (Miyaki and Fernandez 2001).Social influence refers to user's perception of significant others requiring them to use medical diagnostic systems whereas facilitating conditions relate to the extent that users believe organizational and technical infrastructure exist to support the use of medical diagnostic systems. There seem to be similarities between the construct of social influence and savings/cost (Heeks R 2006), perceived Trust (Roca et al 2008) and awareness (Heeks R 2006).

Users will adopt a technology if they perceive it as helping them to improve their performance and consequently find it relevant in performing their tasks. So the user's judgment of job relevance based on awareness of the technology capabilities in enhancing user's performance contribute to enhance the perceived usefulness (Venkatesh and Davis 2000; Venkatesh et al, 2003). This idea of job-fit is also referred to as near term usefulness which implies improved job performance or job satisfaction (Chau, 1996). Positively valued outcomes resulting from the use of technology will influence users' beliefs about its usefulness (Davis, 1989). Hence, extrinsic motivators associated to the use of the technology are related to perceived usefulness (Davis, 1989).

Moreover, the UTAUT model attempts to explain how individual differences influence technology use. More specifically, the relationship between perceived usefulness, ease of use, and intention to use can be moderated by age, gender and specialty.

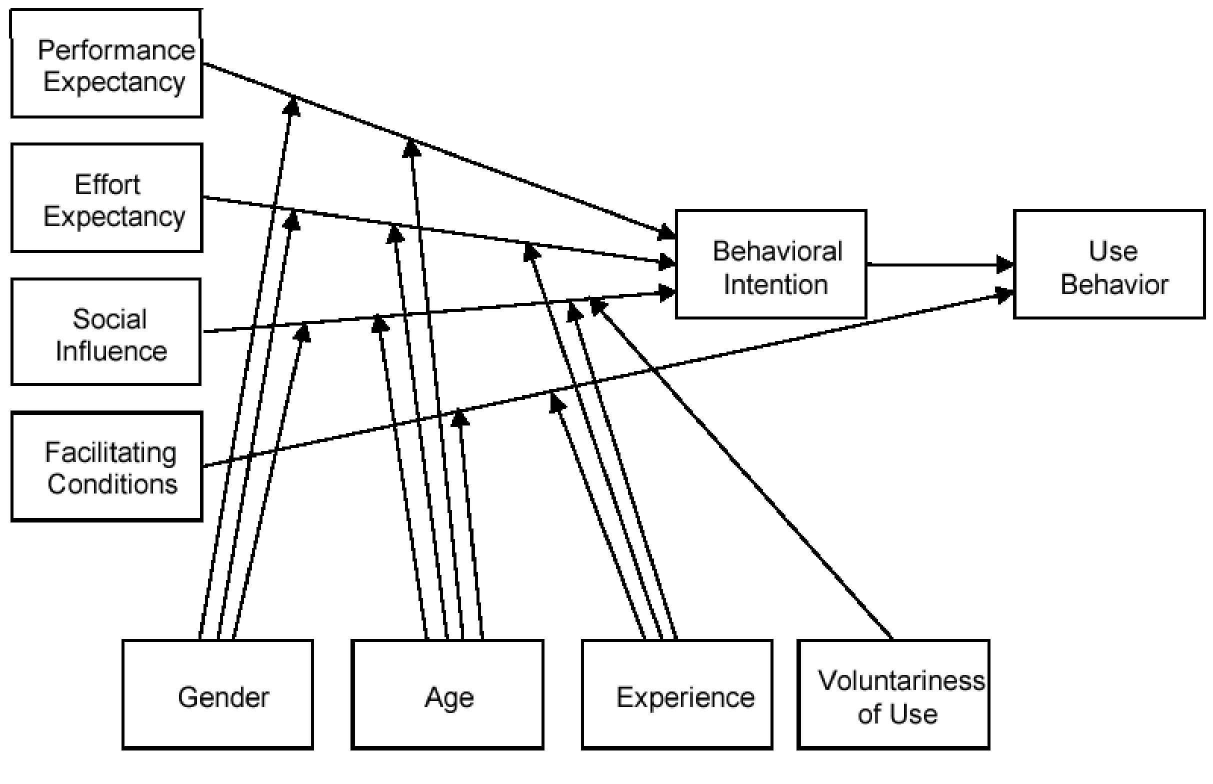


Figure 5: diagram representation of Unified Theory of Acceptance and Use of Technology

Source: Venkatesh, V. and Davis, F.D (2003)

2.5 Comparison of the theoretical models

TRA and TAM, both of which have strong behavioral elements, assume that when someone forms an intention to act, that they will be free to act without limitation. In the real world there will be many constraints, such as limited freedom to act Bagozzi, Davis & Warshaw (1992).Bagozzi, Davis and Warshaw say because new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using. Attitudes towards usage and intentions to use may be ill-formed or lacking in conviction or else may occur only after preliminary strivings to learn to use the technology evolve. Thus, actual usage may not be a direct or immediate consequence of such attitudes and intentions. Bagozzi, Davis & Warshaw (1992)

Several researchers have replicated Davis's original study (Davis 1989) to provide empirical evidence on the relationships that exist between usefulness, ease of use and system use Adams, Nelson & Todd (1992; Davis (1989;). Much attention has focused on testing the robustness and validity of the questionnaire instrument used by Davis.

Adams et al. (Adams 1992) replicated the work of Davis (Davis 1989) to demonstrate the validity and reliability of his instrument and his measurement scales. They also extended it to different settings and, using two different samples, they demonstrated the internal consistency and replication reliability of the two scales. Hendrickson et al. Hendrickson, Massey & Cronan (1993) found high reliability and good test-retest reliability. Szajna (1996, found that the instrument had predictive validity for intent to use, self-reported usage and attitude toward use.

Venkatesh and Davis extended the original TAM model to explain perceived usefulness and usage intentions in terms of social influence and cognitive instrumental processes. The extended model, referred to as TAM2, was tested in both voluntary and mandatory settings. The results strongly supported TAM2 Venkatesh & Davis (2000).

Due to this extensive and modification of the TAM framework, it is only prudent to use its concept in coming up with a framework that will ensure complete and perfect adoption of medical diagnostic systems thus the use of the UTAUT model.

Also the UTAUT model was considered as a theory for use in this research based on the following merits:

i) It amalgamates all earlier theories of human behavior that is TRA TPB etc in terms of their constructs.

ii) It has gained wide acceptance and use in many information related studies

iii) It has been used in many studies across the globe with positive results in both developed and developing countries.

iv) It has been tested in the same line of computer assisted medical diagnostic systems in other areas with positive results making it ideal for this study

CHAPTER THREE: THEORETICAL FRAMEWORK

3.1 Chapter Overview

This chapter is about the conceptual frameworks that were used in carrying out the research and stating of the various hypotheses that were investigated. It highlights the constructs identified from the literature review and the moderating factors influencing these constructs.

3.2 Definition of constructs

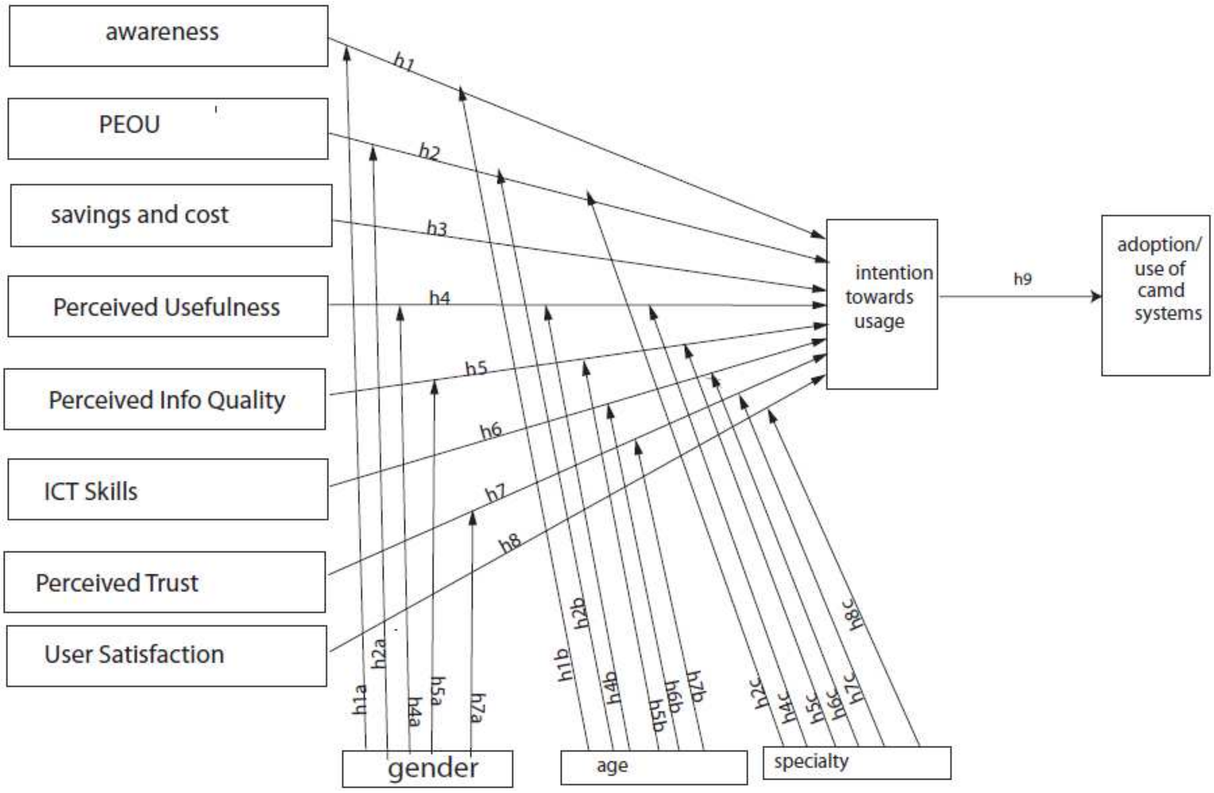
Table 2: Definition of the research framework constructs

Construct	Definition	Reference:
Perceived usefulness (PU)	"The degree to which a person believes that using a particular system would enhance his or her job performance". In medical diagnostic systems context, it is perceived as the likelihood that the technology will benefit the users. A significant body of TAM research has provided evidence that PU is a strong determinant of user acceptance, adoption, and usage behavior.	(Davis 1989)
Perceived ease-of-use PEOU)	The degree to which a person believes that using a particular system would be free from effort. This construct is linked to a potential medical diagnostic system user's estimation of the effort he or she will put to understand and use such as a system	(Davis 1989)
Perceived information Quality	The medical diagnostic system	Venkatesh et al, 2003

(PIQ)	users' perception of the quality of information. Perceived quality refers to the value of the information input into these systems	
User satisfaction	This refers to the overall users' satisfaction with the medical diagnostic systems in terms of content, interface, speed, quality and security.	Venkatesh et al, 2003
Perceived Trust	The perception of confidence in medical diagnostic systems in terms of reliability and integrity	Roca et al (2008)
ICT skills & experience (EXPERIENCE)	Duration of experience and frequency of use. The level of specialized expertise to be able to use the medical diagnostic system.	Miyaki and Fernandez (2001)
Saving/cost	User's perception of whether the cost benefit pattern of using medical diagnostic system is acceptable.	Heeks R (2006)
Awareness	Peoples knowledge of medical diagnostic systems and services they can provide, and the availability of electronic services.	Heeks R (2006)
Intention to use	Reflects the desire to use the medical diagnostic system services now and in the future. This includes willingness to	Davis et al (1989)

	use medical diagnostic system	

Figure 6: The proposed framework



3.3 Definition of hypothesis

The proposed framework above has different hypotheses and they were as follows

H1: states that there is a positive correlation between awareness and intention to use computer assisted medical diagnostics system.

H2: states that there is a positive relation between perceived ease of use and intention to use and eventually adoption of computer assisted medical diagnostics system.

H3: indicates there is a positive relation between affordability of computer assisted medical diagnostics systems and the intention to use and eventually adoption.

H4: States that there is a positive correlation between perceived usefulness and intention to use computer assisted medical diagnostics systems and eventual adoption.

H5: states that there is a positive correlation between perceived information quality and the intention to use computer assisted medical diagnostics systems.

H6: states that there is a positive correlation between the level of ICT Skills required and the use of computer assisted medical diagnostics systems.

H7: states that there is a positive correlation between user satisfaction and the intention to use computer assisted medical diagnostics systems and eventual adoption.

H8: states that there is a positive correlation between the perceived trust and intention to use computer assisted medical diagnostics systems and eventual adoption.

H9: states that there is a positive correlation between attitude towards usage and adoption/use of computer assisted medical diagnostics systems.

H1a: states that there is a positive relation between gender and the level of awareness of availability of computer assisted medical diagnostics systems.

H2a: states that there is a positive relation between gender and the perceived ease of use of computer assisted medical diagnostics systems.

H4a: states that there is a positive relation between gender and the perceived usefulness of computer assisted medical diagnostics systems.

H5a: states that there is a positive relation between gender and the perceived information quality of computer assisted medical diagnostics systems.

H7a: states that there is a positive relation between gender and the perceived trust of computer assisted medical diagnostics systems.

H1b: states that there is a positive relation between age and the level of awareness of availability of computer assisted medical diagnostics systems.

H2b: states that there is a positive relation between age and the perceived ease of use of computer assisted medical diagnostics systems.

H4b: states that there is a positive relation between age and the perceived usefulness of computer assisted medical diagnostics systems.

H5b: states that there is a positive relation between age and the perceived information quality of computer assisted medical diagnostics systems.

H6b: states that there is a positive relation between age and the level of ICT Skills of users of computer assisted medical diagnostics systems.

H7b: states that there is a positive relation between age and the perceived trust of use of computer assisted medical diagnostics systems.

H2c: states that there is a positive relation between specialty and the perceived ease of use of computer assisted medical diagnostics systems.

H4c: states that there is a positive relation between specialty and the perceived usefulness of computer assisted medical diagnostics systems.

H5c: states that there is a positive relation between specialty and the perceived information quality of medical diagnostic systems.

H6c: states that there is a positive relation between specialty and the level of ICT Skills of users of computer assisted medical diagnostics systems.

H7c: states that there is a positive relation between specialty and the perceived trust of use of computer assisted medical diagnostics systems.

H8c: states that there is a positive relation between specialty and the perceived user satisfaction of use of computer assisted medical diagnostics systems.

3.4 Conceptualization of the variables

According to Cooper and Schindler (2011), "there is nothing very tricky about the notion of independence and dependence. But there is something tricky about the fact that the relationship of independence and dependence is a figment of the researcher's imagination until demonstrated convincingly. Researchers hypothesize relationships of independence and dependence. They invent them and then they try by reality testing to see if the relationships actually work out that way". Cooper and Schindler (2011) define dependent variable as a "variable that is measured, predicted, or otherwise monitored and is expected to be affected by manipulation of an independent variable". They also defined independent variable as a "variable that is manipulated by the researcher, and the manipulation causes an effect on the dependent variable". Lastly they define moderating variable (also known as interaction variable) as a "second independent variable that is included because it is believed to have significant contributory or contingent effect on the original independent variable – dependent variable relationship". Dwivedi and Weerakkody (2007) proposed that personal variables can be considered as independent variables to explain the difference between adopters and non adopters of technology.

In our case (fig 1; conceptual framework), we have eight independent variables which are our constructs. From each and every, we shall make a hypothesis which shall be tested accordingly. The demographic factors shall constitute moderating variable of which there will be an independent hypothesis for each demographic factor and its effect tested.

3.3.1 Dependent variable

The dependent variable intention to use medical diagnostic systems will determine the utilization or usage level of these systems.

3.3.2 Independent variable

Independent variables are the variables that are expected to affect doctors level of usage/ utilizations of medical diagnostic systems, these are:

- perceived usefulness
- perceived ease of use
- perceived information quality
- internet safety perception
- ICT skills and experience
- Saving/cost
- Awareness
- Satisfaction

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

This chapter discusses data to be used in this study, how they would be collected and the analysis techniques and method that will be applied in analyzing the data. It describes the characteristics of the population and other variables, and how data will be collected and measured. It also discusses data analysis procedures and the statistical methodology utilized in analyzing the data upon collection and general data analysis methods and techniques.

4.2 Research Design

The study used descriptive research design which was concerned with analysis of existing data or facts and makes a critical review of the same with a view of understanding the situation. The study used both qualitative and quantitative data and that is why it adopted descriptive design. Descriptive research design is a description of the state of affairs as it exists at the present. The research design was exploratory-utilizing largely qualitative and quantitative research methods. The aim of using such a design was to capture the overall scenario of efforts put in place for implementation of medical diagnostic systems, and also gets the views and perception of those involved in order to formulate a framework to facilitate adoption of medical diagnostic systems. For example data collection was largely quantitative based on use of a questionnaire because of respondents' willingness to be interviewed. Explaining of results was done using qualitative approach.

4.3 Target Population and Sampling Frame

A population can be defined as the entire group of individuals, events or objects having a common observable characteristic Mugenda and Mugenda (2003). Researchers usually cannot make direct observations of every individual in the population they are studying. The study respondents were drawn from selected hospitals. The criterion for selection was accessibility to the hospitals and cooperation of respondents. The selection was random, where each member of the population had an equal opportunity to become part of the sample.

The study was carried out in hospitals in Nairobi due to their proximity to the researcher. From the master facility list, obtained from the ministry of health at Afya House, it was established there were at least seventy gazzeted hospitals while others were categorized as health facilities and were not full hospitals. The study targeted hospitals which are expected to purchase these medical diagnostic systems to be used by the practitioners at their premises. About seven hospitals were chosen with at least ten respondents, five being male and five being female doctors, per hospital, with a specific focus on specialists who are expected to be the major users of the medical diagnostic systems. Also there were interviews with ministry of public works and sanitation officials to gather the level of adoption of medical diagnostic systems.

4.4 Samples and Sampling Procedure

The study was carried out using purposive sampling method. Purposive sampling was used to identify key respondents that are directly involved in utilization of medical diagnostic systems since they are knowledgeable, well informed and participate in decision making. Note that the specialists were chosen in a random way but the study was purposive as majorly specialists were interviewed.

The study adopted stratified random sampling. According to Mugenda and Mugenda (2003) the goal of stratified random sampling was to achieve desired representation from various subgroups in the population. The population can be divided into known groups, and each group sampled using a systematic approach. The number sampled in each group was proportion to its known size in the parent population. According to Mugenda and Mugenda (1999) a 10% sample size is representative. The study intends to select 70 doctors from 7 different hospitals

n=N

1+N (e)^2

Where : n: the sample size

N: the population size

e: the level of preciseness

Error margin +4

4.5 Instrumentation

The main research tool that will be used is a structured questionnaire which is preferred as it provided a relatively simple and straightforward approach to the study. A structured questionnaire with a cover letter was used in the data collection. Likert scale was used in the questionnaire.

4.6 Data Collection Procedures

The study will use both primary and secondary data. Secondary data was obtained from e- journals, books and websites. Primary data was obtained email and self-administered questionnaires. This tool was selected because it is cheaper and easier to analyze and administer in terms of time.

4.7 Data Analysis Technique

The SPSS software was used to analyze the data. Descriptive techniques such as frequencies, tables and graphs were also used in the analysis.

Other than that the Pearson's Coefficient's test, chi square distribution tests was used to test the frequencies of several constructs and their correlation with intention to use, t test was used to test correlation of demographic factors and the various constructs.

Chi square test is where the chi square value of data obtained is established and it's compared with a value from the chi square table at a certain degree of freedom and significance level. If the former is greater than the latter we the hypothesis that the proportion of those who would use medical diagnostic systems has a positive relationship to the independent variables otherwise we reject it.

Also Spearman's rank correlation is a non-parametric test that is used to measure the degree of association between two variables. Spearman's rank correlation test does not assume any assumption about the distribution, meaning that the data presented has a non-normal distribution. We used spearman's rank correlation analysis to verify the relationship between the various constructs and attitude towards usage.

4.8 Validity

Validity is the accuracy and meaningfulness of inferences, which are based on the research results Mugenda and Mugenda (2003). To confirm validity of research tool proper examination was done to ensure proper coverage and research objectives are achieved.

CHAPTER FIVE: RESULTS AND DISCUSSION

5.0 Introduction

This chapter presents research findings, analysis and discussion. It focuses on providing solutions and research objectives. The main research tool used in the findings was self-administered questionnaire. The study set to analyze the various frameworks for adoption used in other parts of the world and the assessment on the major constructs required for developing such frameworks. During the study effort was taken to find out if the users in this case the doctors were aware of the existence of computer assisted medical diagnostics systems and the framework for their adoption in Kenya. The findings of this chapter will result in designing of a framework for adoption of CAMD systems in Kenya

5.1 Data Analysis

5.1.1 Methods of data analysis

Both descriptive and inferential statistics were used to analyze data. Descriptive statistics included means, frequencies and percentages. Inferential statistics included correlation tests such as Chi square distribution test, t test, and ANOVA which were used at several points as they were dimmed efficient.

To achieve the first objective which was (To Analyze different frameworks used by different countries and states to facilitate adoption of computer assisted medical diagnostic systems and identify what can be borrowed from them so as to come up with a suitable framework), different frameworks such as TAM and UTAUT were analyzed.

To achieve the second objective which was (To Identify the gaps in the current framework that need to be addressed), the various constructs obtain from the literature review were analyzed using correlation to indicate their relation to the intention of use of computer assisted medical diagnostic systems.

To achieve the third objectives which was (To validate the framework), regression analysis was used to identify the relationship between the moderating factors (demographic factors) and the various constructs and their effect on intention to use the computer assisted medical diagnostic systems. Also chi square was used to confirm the relationship between the various constructs and the intention to use computer assisted medical diagnostic systems and eventuality the validated framework design.

5.2 Reliability

Reliability is that quality of measurement that suggests that the same data will be collected each time in repeated observation of the same phenomenon (Chandron, 2004). The respondents for pilot were 6 doctors from 3 hospitals. Cronbach's Alpha coefficient formula was used to estimate internal consistency. Reliability coefficient of 0.7 and above was recommended (Cronchbach, 1951).

Table 3: Table of summary of reliability

Section	**No. of Questions**	**Cronbach's Alpha**	**Cut off**	**Comment**
Conducting available framework	2	0.698	0.7	Reliable
Various constructs on awareness, cost and usage	13	0.713	0.7	Reliable
Various constructs on information quality, ICT skills and satisfaction	10	0.843	0.7	Reliable

5.3 Response Rate

The tables below shows demographic characteristics of the respondents obtained from the questionnaire. Respondents were mainly doctors as these CAMD systems are majorly designed for them.

Table 4: Response rate

	Response rate	**% Response rate**
Successful	**45**	**64.29**
Unsuccessful	**25**	**35.71**
Total	**70**	

The successful response rate was 64.29% percent and the unsuccessful response rate was 35.71% percent. A total of 45 valid questionnaires were received out of a possible 70 that were issued. These mainly are due to the busy schedules of the doctors that we didn't have a response rate of 100%. The response rate was 64.29%. According to Mugenda and Mugenda (1999), a response rate of 50 percent is adequate for data analysis.

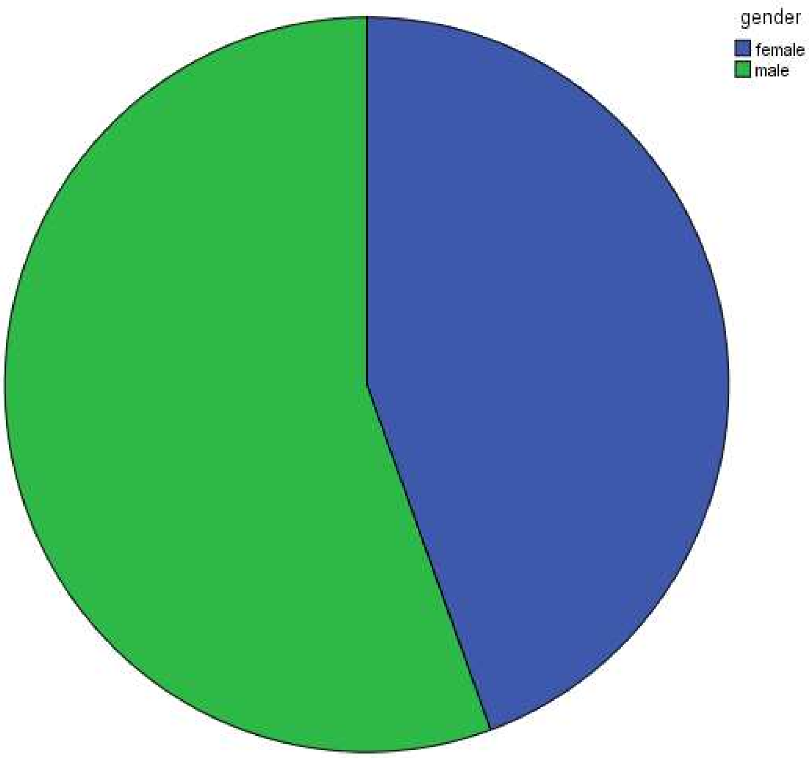
5.4 Gender response Rate

The study sought to establish the gender distribution of the respondents. The findings were presented in table 5 below

Table 5 : Gender of respondent

Frequency	Percent	Valid Percent	Cumulative Percent
20	44.4	44.4	44.4
25	55.6	55.6	100.0
45	100.0	100.0	

Figure 7: Gender of respondent



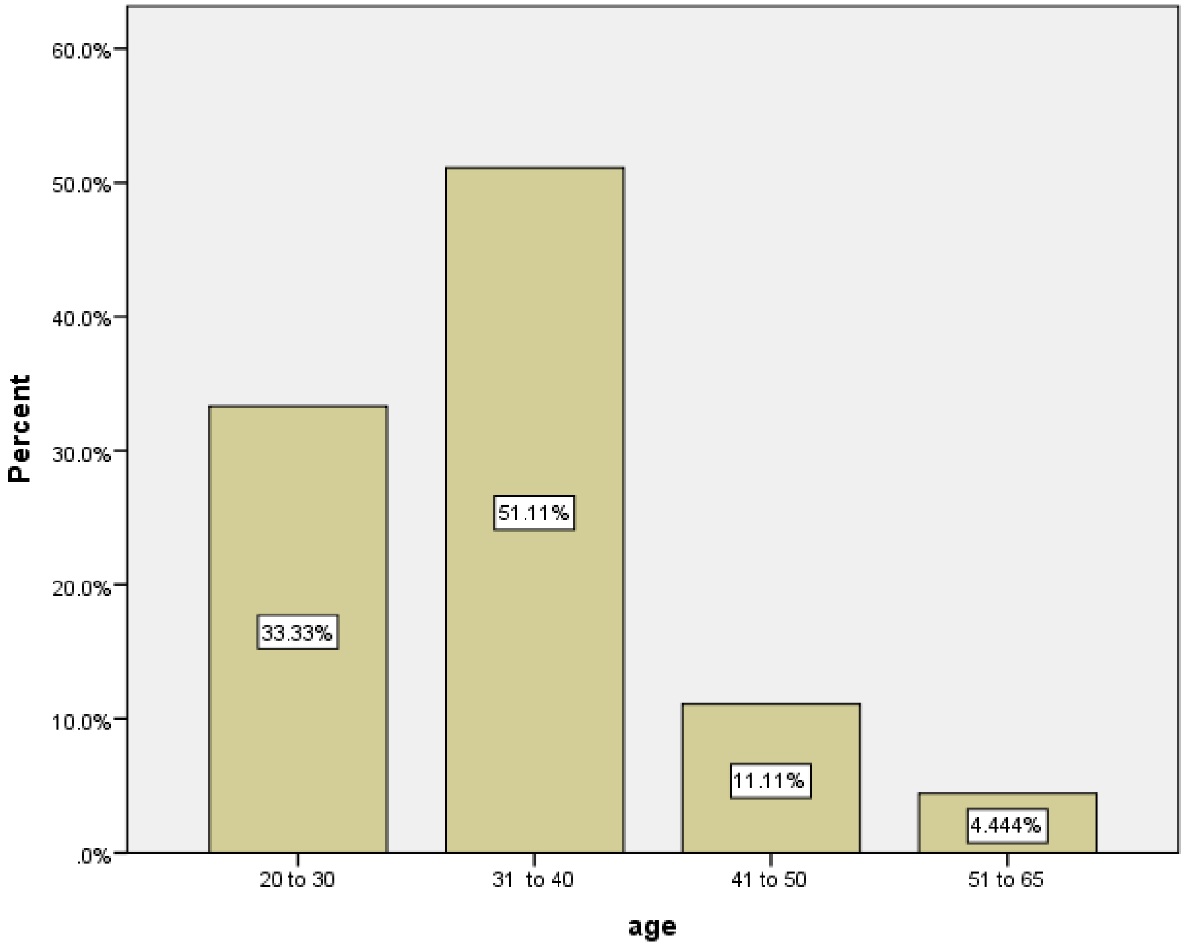
According to table 5 above, a total of 45 respondents responded to the data that was collected, from different hospitals 55.6% were male and 44.4% were female. This indicates that more male doctors than their female counterparts responded to the questionnaire.

5.5 Age Distribution

The study attempted to establish the age distribution of the respondents. The findings are as per figure 2 below.

According to figure 8 below, 33.33 % of the respondents are between 21-30 years, 51.11% are 31-40 year, 11.11% are 41-50, and 4.444% are over 50 years. This indicates that most of the respondents are young doctors who are at the verge of specializing.

Figure 8: Age Distribution

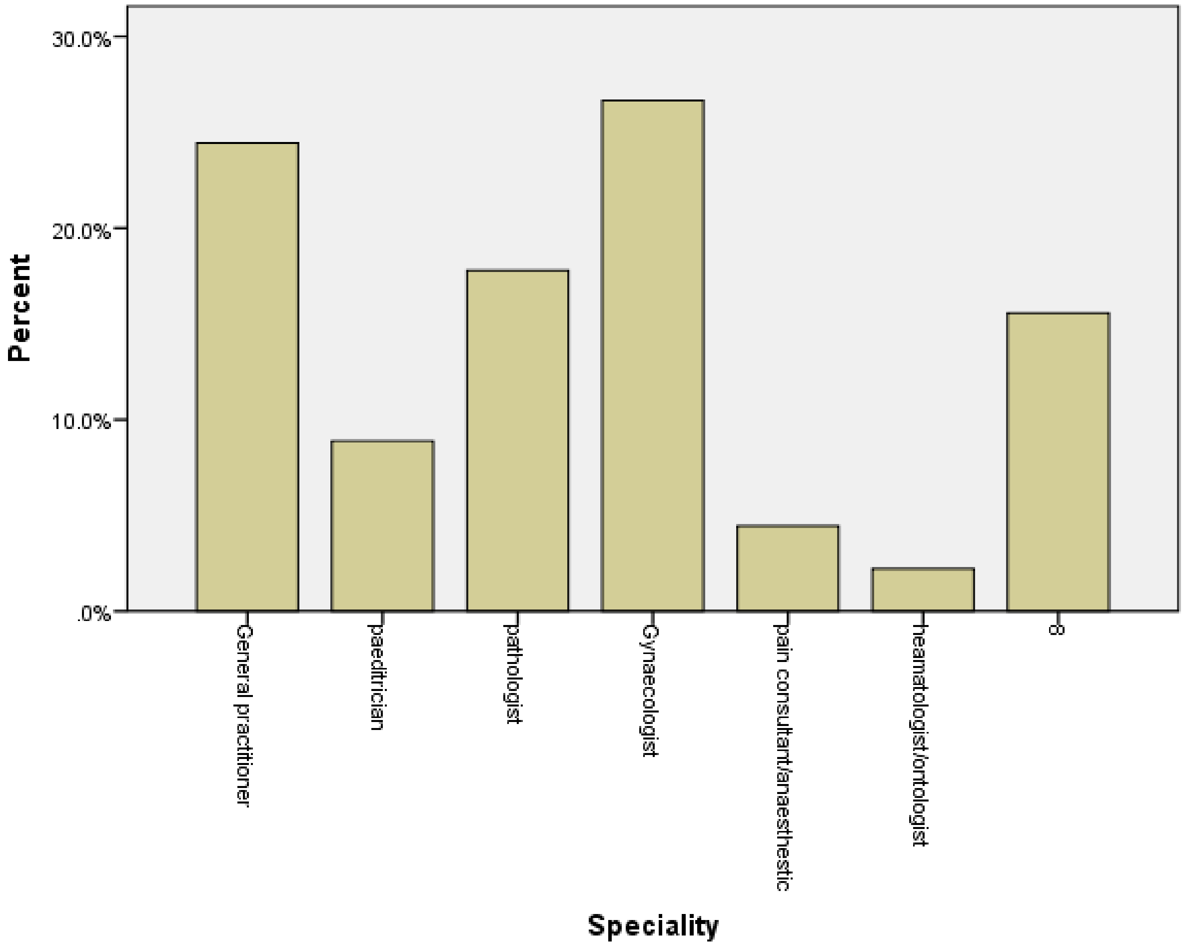


5.6 Specialization

The study also sought to establish the area of expertise of the respondents. The findings were presented in figure 9 below.

The study findings reveal that a majority of the respondents were specialists with only 15% being other clinical officers. These results imply that the respondents may have been exposed to the CAMD systems in one way or another as they are the people these systems are designed for hence knowledgeable of the medical diagnostics systems usage. In addition the findings imply that the respondents were well distributed across all categories of users.

Figure 9: Specialization



5.7Constructs correlations

5.7.1 Awareness

At this point this study investigates the first hypothesis H1

H1: states that there is a positive correlation between awareness and intention to use computer assisted medical diagnostics system.

The study investigates this hypothesis by means of a chi square test and verifies by Pearson coefficient test.

The mean values of the test items of the construct of awareness indicate that generally, the respondents are aware of the presence of CAMD systems and their impact on diagnosis. The average observed chi square value is greater than the expected as indicated below. This indicates for effective adoption, awareness drive is essential.

Table 6: **Table 5.4.1a Chi square table for awareness**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.778[a]	10	.553
Likelihood Ratio	11.139	10	.347
Linear-by-Linear Association	.001	1	.979
N of Valid Cases	45		

The findings indicate that the chi square value is 6.089 and at a degree of freedom of 2 and level of significance of 0.168 the conventional value should be 0.211, as indicated from the universal chi square table, implying that there was a positive relationship between the awareness and usage. This means that an increase in awareness by 1% leads to an increase in intention to use and eventually adoption.

Table 7: **Table 5.4.1b Pearson's coefficient test for awareness**

		Awareness1	Awareness4	RECOMMENDATION
Awareness1	Pearson Correlation	1	.050	.124
	Sig. (2-tailed)		.810	.555
	N	26	26	25
Awareness4	Pearson Correlation	.050	1	.244
	Sig. (2-tailed)	.810		.239
	N	26	26	25
RECOMMENDATION	Pearson Correlation	.124	.244	1
	Sig. (2-tailed)	.555	.239	
	N	25	25	25

From the table 5.5.1b above, we see that the Pearson's coefficient for awareness is consistent hence we conclude there is a statistical correlation between awareness and intention to use CAMD systems hence the hypothesis has been verified to be statistically significant.

5.7.2 Perceived ease of use

The hypothesis under investigation

H2: states that there is a positive relation between perceived ease of use and intention to use and eventually adoption of computer assisted medical diagnostic.

This is tested using the Chi square test and verified using the Pearson's coefficient test.

The mean values of the test items of the construct of perceived ease of use indicate that the respondents agree that the CAMD systems are easy to use. The chi square test for perceived ease of use shows a significant correlation of 6.134 compared to 3.49 which is the expected value

Table 8:**Table 5.5.2a Chi square table for Perceived ease of use**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.189[a]	8	.737
Likelihood Ratio	6.778	8	.561
Linear-by-Linear Association	.397	1	.529
N of Valid Cases	45		

There was a significant positive relationship between the perceived ease of use and usage as reflected by a coefficient of 6.134 (chi square expected was 3.49). This means that an increase in perceived ease of use by 1% leads to an increase in intention to use and eventually adoption. The findings are consistent with those of Davies et al. (1989) who asserted that perceived ease of use influences one's attitude towards system usage, which influences one's behavioral intention to use a system, which, in turn, determines actual usage.

From the table 5.5.2b, the coefficient for perceived ease of use and intention to use CAMD systems is significant at the 0.05 confidence level. Therefore the hypothesis H2 is verified to be correct.

Table 9: **Table 5.5.2b Pearson's Coefficient test for Perceived ease of use**

		RECOMMENDATION	easeofuse 1	easeofuse 2	easeofuse 3	easeofuse 4	easeofuse 5
RECOMMENDATION	Pearson Correlation	1	.369	.307	.365	.094	.392
	Sig. (2-tailed)		.070	.136	.073	.655	.053
	N	25	25	25	25	25	25
easeofuse1	Pearson Correlation	.369	1	.449*	.461*	.421*	.687**
	Sig. (2-tailed)	.070		.021	.018	.032	.000
	N	25	26	26	26	26	26
easeofuse2	Pearson Correlation	.307	.449*	1	.702**	.351	.401*
	Sig. (2-tailed)	.136	.021		.000	.079	.042
	N	25	26	26	26	26	26
easeofuse3	Pearson Correlation	.365	.461*	.702**	1	.560**	.450*
	Sig. (2-tailed)	.073	.018	.000		.003	.021
	N	25	26	26	26	26	26
easeofuse4	Pearson Correlation	.094	.421*	.351	.560**	1	.575**
	Sig. (2-tailed)	.655	.032	.079	.003		.002
	N	25	26	26	26	26	26
easeofuse5	Pearson Correlation	.392	.687**	.401*	.450*	.575**	1
	Sig. (2-tailed)	.053	.000	.042	.021	.002	
	N	25	26	26	26	26	26

*. Correlation is significant at the 0.05 level (2-tailed).

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

5.7.3 Savings/Cost

The hypothesis under investigation here

H3: indicates there is a positive relation between affordability of computer assisted medical diagnostic systems and the intention to use and eventually adoption.

Also this constructs checks whether the doctor will be able to save time if they use these systems and the patient saves money. To establish whether this hypothesis was supported by the findings of the data collected, chi square test was carried out and it was verified by Pearson's coefficient test.

The mean values for the test items of savings in term of money and time shows that most of the respondents did not agree strongly that there would be any savings in terms of money on the parts of the doctors as eventually some of the patients would end up seeing a doctor still and most were in agreement that time would surely be saved as indicated by the chi square table for savings below.

Table 10: **Table 5.5.3.1 Chi square value for cost**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.531[a]	2	.282
Likelihood Ratio	2.517	2	.284
Linear-by-Linear Association	.450	1	.503
N of Valid Cases	45		

Table 11: **Table 5.5.3.2 chi square table for time**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.437[a]	2	.179
Likelihood Ratio	3.239	2	.198
Linear-by-Linear Association	.825	1	.364
N of Valid Cases	44		

There was a significant positive relationship between the savings/cost and usage as reflected by a chi square value of 4.083 (chi square expected was 0.211). This means that if the CAMD systems are eventually adopted, both the doctors and the patients will save in terms of time and money respectively hence eventual adoption.

Table 12: **Table 5.5.3.3 Pearson's coefficient test for cost and time**

		RECOMMENDATION	cost1	cost2	time
RECOMMENDATION	Pearson Correlation	1	.023	.046	.118
	Sig. (2-tailed)		.912	.826	.575
	N	25	25	25	25
cost1	Pearson Correlation	.023	1	.456*	.603**
	Sig. (2-tailed)	.912		.019	.001
	N	25	26	26	26
cost2	Pearson Correlation	.046	.456*	1	.537**
	Sig. (2-tailed)	.826	.019		.005
	N	25	26	26	26
Time	Pearson Correlation	.118	.603**	.537**	1
	Sig. (2-tailed)	.575	.001	.005	
	N	25	26	26	26

*. Correlation is significant at the 0.05 level (2-tailed).

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

From table 5.5.3.3 above, it is verified that time and costs are statistically significant as far as intention to use CAMD systems is concerned.

5.7.4 Perceived usefulness

At this point, the hypothesis under investigation

H4: States that there is a positive correlation between perceived usefulness and intention to use computer assisted medical diagnostic systems and eventual adoption.

The mean values for the test items of perceived usefulness indicate that the respondents agree with the fact that CAMD systems are a useful innovation in the ICT and Medical world. The chi square value of the test items in perceived usefulness show significant correlations.

Table 13:**Table 5.5.4a Chi square table for perceived usefulness**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.134[a]	8	.194

Likelihood Ratio	13.570	8	.094
Linear-by-Linear Association	.641	1	.423
N of Valid Cases	45		

There was a significant positive relationship between the perceived usefulness and usage as reflected by a chi square observed value of 11.78 (chi square expected was 3.49). This means that an increase in perceived usefulness leads to an increase in intention to use and eventually adoption. The findings were in agreement with those of Daves et al (1989) who concluded that positively valued outcomes resulting from the use of the technology will influence users' beliefs about its usefulness.

From Table 5.5.4b below, we note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role has been met. It is evident that the values for perceived usefulness are statistically significant according to the Pearson's coefficient test. This verifies the fact that perceived usefulness influences intention to use CAMD systems and eventually adoption.

Table 14: Table 5.5.4b Pearson's coefficient test for perceived usefulness

		usefulness1	usefulness2	usefulness3
usefulness1	Pearson Correlation	1	.443**	.567**
	Sig. (2-tailed)		.002	.000
	N	45	45	45
usefulness2	Pearson Correlation	.443**	1	.389**
	Sig. (2-tailed)	.002		.008
	N	45	45	45
usefulness3	Pearson Correlation	.567**	.389**	1
	Sig. (2-tailed)	.000	.008	
	N	45	45	45

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

5.7.5 Perceived information quality

The hypothesis under investigation is

H5: states that there is a positive correlation between perceived information quality and the intention to use computer assisted medical diagnostic systems.

The mean values of the test items of perceived information quality shows that the respondents highly appreciate information they would value in these diagnostic systems. There is a significant correlation between the test items under the construct of perceived information quality as indicated in table 4 below.

Table 15: **Table 5.5.5a Chi square table on perceived information quality**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.639[a]	8	.067
Likelihood Ratio	17.937	8	.022
Linear-by-Linear Association	6.788	1	.009
N of Valid Cases	45		

There was a significant positive relationship between the perceived information quality and usage as reflected by a coefficient of 12.689 (expected chi square value was 3.49). This means that an increase in perceived information quality leads to an increase in intention to use.

Table 16:**Table 5.5.5b Pearson's coefficient test for perceived information quality**

		informationquality1	informationquality 2
Informationquality 1	Pearson Correlation	1	.531**
	Sig. (2-tailed)		.000
	N	45	45
Informationquality 2	Pearson Correlation	.531**	1
	Sig. (2-tailed)	.000	
	N	45	45

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

From Table 5.5.5b above, it is evident that the values for perceived information quality are statistically significant according to the Pearson's coefficient test. This verifies the fact that perceived information quality influences intention to use CAMD systems and eventually adoption.

5.7.6 ICT Skills

The hypothesis under investigation here

H6: states that there is a positive correlation between the level of ICT Skills required and the use of computer assisted medical diagnostic systems.

The mean values for the test item of ICT skills indicate that the level of IT skills required such medical systems should not be too technical. Also it indicates that the respondents concerned are computer literate. There is a significant correlation of between the test items under the construct of ICT skills.

Table 17: **Table 5.5.6a chi square table for ICT Skills**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.301[a]	8	.829
Likelihood Ratio	4.708	8	.788
Linear-by-Linear Association	.286	1	.593
N of Valid Cases	45		

There was a significant positive relationship between the ICT skills or experience and usage as reflected by a chi square observed of 6.99 (chi square expected was 4.168). This means that an increase in ICT experience leads to an increase in intention to use and eventual adoption; the systems should be developed in such a way that they are not too technical for a layman to encourage prompt adoption.

Table 18: **Table 5.5.6b Pearson's coefficient test for ICT Skills**

		ICTSkills1	ICTSkills2	ICTSkills3a	ICTSkills3b
ICTSkills1	Pearson Correlation	1	.558**	.427**	.373*
	Sig. (2-tailed)		.000	.003	.012
	N	45	45	45	45
ICTSkills2	Pearson Correlation	.558**	1	.425**	.375*
	Sig. (2-tailed)	.000		.004	.011
	N	45	45	45	45
ICTSkills3a	Pearson Correlation	.427**	.425**	1	.814**
	Sig. (2-tailed)	.003	.004		.000
	N	45	45	45	45
ICTSkills3b	Pearson Correlation	.373*	.375*	.814**	1
	Sig. (2-tailed)	.012	.011	.000	

N	45	45	45	45

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

*. Correlation is significant at the 0.05 level (2-tailed).

From Table 5.5.6b above, it is evident that the values for ICT skills are statistically significant according to the Pearson's coefficient test. This verifies the fact that ICT skills influence intention to use CAMD systems and eventually adoption.

5.7.7 User Satisfaction

The hypothesis under investigation here

H7: states that there is a positive correlation between user satisfaction and the intention to use computer assisted medical diagnostic systems and eventual adoption.

The construct of user satisfaction had five items which try to evaluate the comfort ability of the users while interacting with medical diagnostic systems in terms of the interface, the speed of the internet and connectivity whenever required. The correlations between the test items were significant with all having an average observed chi square value of 7.96 which is greater than the expected value of 3.49.

There was a significant relationship between the satisfaction and usage as reflected by a coefficient of 7.96 (chi square expected was 3.49). This means that an increase in satisfaction by leads to an increase in intention to use and eventually adoption.

Table 19: **Table 5.5.7a Chi square value for user satisfaction**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.189[a]	8	.737
Likelihood Ratio	6.778	8	.561
Linear-by-Linear Association	.397	1	.529
N of Valid Cases	45		

Table 20:**Table 5.5.7b Pearson's coefficient test for user satisfaction**

	UserSatisfaction1	UserSatisfaction2	UserSatisfaction3	UserSatisfaction4	UserSatisfaction5

UserSatisfaction1	Pearson Correlation	1	.711**	.428**	.364*	.457**
	Sig. (2-tailed)		.000	.003	.014	.002
	N	45	45	45	45	45
UserSatisfaction2	Pearson Correlation	.711**	1	.607**	.521**	.400**
	Sig. (2-tailed)	.000		.000	.000	.006
	N	45	45	45	45	45
UserSatisfaction3	Pearson Correlation	.428**	.607**	1	.712**	.643**
	Sig. (2-tailed)	.003	.000		.000	.000
	N	45	45	45	45	45
UserSatisfaction4	Pearson Correlation	.364*	.521**	.712**	1	.526**
	Sig. (2-tailed)	.014	.000	.000		.000
	N	45	45	45	45	45
UserSatisfaction5	Pearson Correlation	.457**	.400**	.643**	.526**	1
	Sig. (2-tailed)	.002	.006	.000	.000	
	N	45	45	45	45	45

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

*. Correlation is significant at the 0.05 level (2-tailed).

From Table 5.5.7b above, it is evident that the values for user satisfaction are statistically significant according to the Pearson's coefficient test. This verifies the fact that user satisfaction influence intention to use CAMD systems and eventually adoption.

5.7.8 Perceived Trust

The hypothesis under investigation here

H8: states that there is a positive correlation between the perceived trust and intention to use computer assisted medical diagnostic systems and eventual adoption.

The construct of perceived trust had three test items. On average, the respondents agreed that privacy of information obtained or revealed from these medical diagnostic systems is of the essence. The correlations between the test items were significant.

Table 21: **Table 5.5.8a Chi square table for perceived trust**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.193[a]	8	.077
Likelihood Ratio	17.315	8	.027
Linear-by-Linear Association	2.315	1	.128
N of Valid Cases	45		

Also, there was a significant relationship between perceived trust and usage as reflected by a chi square observed of 12.15 (chi square expected was 3.49). This means that an increase in perceived trust increases the user's confidence leading to intention to use and eventual adoption.

Table 22: **Table 5.5.8b Pearson's coefficient test for perceived trust**

		PerceivedTrust1	PerceivedTrust2	PerceivedTrust3
PerceivedTrust1	Pearson Correlation	1	.419**	.488**
	Sig. (2-tailed)		.004	.001
	N	45	45	45
PerceivedTrust2	Pearson Correlation	.419**	1	.810**
	Sig. (2-tailed)	.004		.000
	N	45	45	45
PerceivedTrust3	Pearson Correlation	.488**	.810**	1
	Sig. (2-tailed)	.001	.000	
	N	45	45	45

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

From Table 5.5.8b above, it is evident that the values for user perceived trust are statistically significant according to the Pearson's coefficient test. This verifies the fact that perceived trust influence intention to use CAMD systems and eventually adoption.

Table 23: Table5.5 Summary for the average Chi square output

Coefficients **X2**					
Dependent variable usage	Unstandardized coefficients			Standardized coefficient	significance
	(X^2)**{Observed)**	Degree of freedom	Sig. level	Chi square (Expected)	
Awareness	6.089	6.5	0.442	2.83	(X^2)**{Observed)** > Chi square(Expected)
PEOU	6.134	8	0.8	3.49	(X^2)**{Observed)** > Chi square(Expected)
Savings/cost	4.083	2	0.168	0.211	(X^2)**{Observed)** > Chi square(Expected)
PU	11.78	8	0.22	3.49	(X^2)**{Observed)** > Chi square(Expected)
PIQ	12.689	8	0.142	3.49	(X^2)**{Observed)** > Chi square(Expected)
ICT Skills	6.99	8.5	0.38	4.168	(X^2)**{Observed)** > Chi square(Expected)
User Satisfaction	7.96	8	0.63	3.49	(X^2)**{Observed)** > Chi square(Expected)
PT	12.15	8	0.155	3.49	(X^2)**{Observed)** > Chi square(Expected)

5.7.9 Attitude towards usage and adoption of medical diagnostic systems

Lastly the hypothesis under investigation here

H9: states that there is a positive correlation between the intention to use and adoption of computer assisted medical diagnostic systems and eventual adoption.

To determine the correlation between attitude towards usage and adoption of medical diagnostic which had earlier been proven by Davies, 1989 in his investigation of TAM, the two pair ANOVA test was used as indicated in table 5.6 below

Table 24: **Table 5.6 ANOVA test for intention to use and adoption/usage of medical diagnostic system**

		Sum of Squares	Df	Mean Square	F	F table value	Sig.
Awareness1	Between Groups	.761	2	.380	.144	99	.866
	Within Groups	110.884	42	2.640			
	Total	111.644	44				
Awareness4	Between Groups	2.829	2	1.414	.715	99	.495
	Within Groups	83.082	42	1.978			
	Total	85.911	44				
easeofuse1	Between Groups	.185	2	.093	.079	99	.924
	Within Groups	49.015	42	1.167			
	Total	49.200	44				
easeofuse2	Between Groups	.350	2	.175	.114	99	.892
	Within Groups	64.450	42	1.535			
	Total	64.800	44				
easeofuse3	Between Groups	.763	2	.382	.235	99	.792
	Within Groups	68.215	42	1.624			
	Total	68.978	44				
easeofuse4	Between Groups	1.378	2	.689	.473	99	.627
	Within Groups	61.200	42	1.457			
	Total	62.578	44				
easeofuse5	Between Groups	1.391	2	.695	.336	99	.717
	Within Groups	86.921	42	2.070			
	Total	88.311	44				
cost1	Between Groups	1.290	2	.645	3.406	99	.043
	Within Groups	7.954	42	.189			

	Total	9.244	44				
cost2	Between Groups	.607	2	.304	1.251	99	.297
	Within Groups	10.193	42	.243			
	Total	10.800	44				
Time	Between Groups	.715	2	.358	1.737	99	.189
	Within Groups	8.444	41	.206			
	Total	9.159	43				
usefulness1	Between Groups	19.373	2	9.687	6.396	99	.004
	Within Groups	63.604	42	1.514			
	Total	82.978	44				
usefulness2	Between Groups	7.827	2	3.913	3.326	99	.046
	Within Groups	49.418	42	1.177			
	Total	57.244	44				
usefulness3	Between Groups	8.260	2	4.130	1.801	99	.178
	Within Groups	96.318	42	2.293			
	Total	104.578	44				
Informationquality 1	Between Groups	14.765	2	7.382	6.677	99	.003
	Within Groups	46.435	42	1.106			
	Total	61.200	44				
Informationquality 2	Between Groups	4.632	2	2.316	1.902	99	.162
	Within Groups	51.146	42	1.218			
	Total	55.778	44				
ICTSkills1	Between Groups	1.709	2	.854	.671	99	.517
	Within Groups	53.491	42	1.274			
	Total	55.200	44				
ICTSkills2	Between Groups	.623	2	.312	.172	99	.842
	Within Groups	75.954	42	1.808			
	Total	76.578	44				
ICTSkills3a	Between Groups	6.026	2	3.013	2.171	99	.127
	Within Groups	58.285	42	1.388			
	Total	64.311	44				
ICTSkills3b	Between Groups	10.057	2	5.029	3.490	99	.040
	Within Groups	60.521	42	1.441			
	Total	70.578	44				

	Between Groups	1.055	2	.527	.475	99	.625
UserSatisfaction1	Within Groups	46.590	42	1.109			
	Total	47.644	44				
	Between Groups	.396	2	.198	.135	99	.874
UserSatisfaction2	Within Groups	61.515	42	1.465			
	Total	61.911	44				
	Between Groups	1.902	2	.951	.555	99	.578
UserSatisfaction3	Within Groups	72.009	42	1.714			
	Total	73.911	44				
	Between Groups	1.265	2	.632	.478	99	.623
UserSatisfaction4	Within Groups	55.535	42	1.322			
	Total	56.800	44				
	Between Groups	.493	2	.246	.143	99	.867
UserSatisfaction5	Within Groups	72.307	42	1.722			
	Total	72.800	44				
	Between Groups	3.309	2	1.654	1.271	99	.291
PerceivedTrust1	Within Groups	54.691	42	1.302			
	Total	58.000	44				
	Between Groups	11.278	2	5.639	2.843	99	.069
PerceivedTrust2	Within Groups	83.300	42	1.983			
	Total	94.578	44				
	Between Groups	8.661	2	4.331	2.011	99	.147
PerceivedTrust3	Within Groups	90.450	42	2.154			
	Total	99.111	44				

5.8Differences in intention to use medical diagnostic systems across selected demographic factors

5.8.1 Gender and Medical diagnostic systems use

5.8.1aGender and awareness

The hypothesis under test here was:

H1a: states that there is a positive relation between gender and the level of awareness of availability of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for male and female as far as medical diagnostic systems awareness was concerned.

Table 25: **Table 5.6a Paired Samples Test for gender and awareness**

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	gender - Awareness1	-1.538	1.529	.300	-2.156	-.921	-5.130	25	.000
Pair 2	gender - Awareness4	-11.346	31.804	6.237	-24.192	1.500	-1.819	25	.081

It is clear from the two sample t-test results that the gender of the respondents is not a significant factor in their determinant of the level of awareness of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-3.475|>2.060, that is at a degree of freedom of 25 and confidence level of 95%, therefore we reject the claim that there is a positive correlation between gender and the level of awareness of CAMD systems.

5.8.2aGender and perceived ease of use

The hypothesis under test here was

H2a: states that there is a positive relation between gender and the perceived ease of use of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for male and female as far as perceived ease of use of medical diagnostic systems was concerned.

Table 26: **Table 5.6b Paired Samples Test for gender and perceived ease of use**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	gender - easeofuse1	-1.077	.935	.183	-1.454	-.699	-5.874	25	.000
Pair 2	gender - easeofuse2	-1.231	1.243	.244	-1.733	-.729	-5.050	25	.000
Pair 3	gender - easeofuse3	-1.346	1.129	.221	-1.802	-.890	-6.078	25	.000
Pair 4	gender - easeofuse4	-.577	1.137	.223	-1.036	-.117	-2.586	25	.016
Pair 5	gender - easeofuse5	-1.115	1.451	.285	-1.702	-.529	-3.919	25	.001

It is clear from the two sample t-test results that the gender of the respondents is not a significant factor in the determinant of the perceived ease of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-4.701|>2.060, therefore we reject the claim that there is a positive correlation between gender and the perceived ease of use of CAMD systems.

5.8.3aGender and perceived usefulness

The hypothesis which was under investigation was

H4a: states that there is a positive relation between gender and the perceived usefulness of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for male and female as far as perceived usefulness on usage of CAMD systems was concerned**.**

It is clear from the two sample t-test results, table 6c below, that the gender of the respondents is not a significant factor in the determinant of the perceived usefulness of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-6.467|>2.060, therefore we reject the claim that there is a positive correlation between gender and the perceived ease of use of medical diagnostic systems.

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	gender - usefulness 1	-1.346	1.413	.277	-1.917	-.776	-4.859	25	.000
Pair 2	gender - usefulness 2	-2.154	.967	.190	-2.544	-1.763	-11.355	25	.000
Pair 3	gender - usefulness 3	-1.038	1.661	.326	-1.709	-.368	-3.188	25	.004

Table 27: Table 5.6c Paired Samples Test for gender and perceived usefulness

5.8.4aGender and perceived information quality

The hypothesis which was under investigation was

H5a: states that there is a positive relation between gender and the perceived information quality of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for male and female as far as perceived information quality of information as far as medical diagnostic systems was concerned.

It is clear from the two sample t-test results, table 6d below, that the gender of the respondents is not a significant factor to consider when evaluating the perceived information quality of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-6.314|>2.060, that is at a degree of freedom of 25 and a confidence level of 95%, therefore we reject the claim that there is a positive correlation between gender and the perceived ease of use of CAMD systems.

Table 28: **Table 5.6d Paired Samples Test for gender and perceived information quality**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	gender - informationquality1	-1.615	1.329	.261	-2.152	-1.079	-6.198	25	.000
Pair 2	gender - informationquality2	-1.385	1.098	.215	-1.828	-.941	-6.429	25	.000

5.8.5aGender and perceived Trust

The hypothesis which was under investigation here was

H7a: states that there is a positive relation between gender and the perceived trust of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for male and female as far as perceived trust on usage of CAMD systems was concerned**.**

It is clear from the two sample t-test results that the gender of the respondents is not a significant factor in the determinant of the perceived trust on usage of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-3.618|>2.064, at a degree of freedom of 24 and 95% confidence level, therefore we reject the claim that there is a positive correlation between gender and the perceived ease of use of CAMD systems.

Table 29: **Table 5.6e Paired Samples Test for gender and perceived trust**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	gender - PerceivedTrust 1	-1.360	1.075	.215	-1.804	-.916	-6.323	24	.000
Pair 2	gender - PerceivedTrust 2	-.720	1.458	.292	-1.322	-.118	-2.469	24	.021
Pair 3	gender - PerceivedTrust 3	-.640	1.551	.310	-1.280	.000	-2.063	24	.050

5.9Age and Computer Assisted Medical diagnostic systems use

5.9a Age and awareness

The hypothesis under test here was:

H1b: states that there is a positive relation between age and the level of awareness of availability of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for male and female as far as CAMD systems awareness was concerned.

From the two sample t-test results, table 5.7a below, we obtain a t value of |-3.012| which is greater than the t value obtained from the universal t table of 2.021 at a degree of freedom of 44 and confidence level of 95%. This indicates that the age of the respondents is not a significant factor in their determinant of the level of awareness of medical systems or not, therefore we reject the claim that there is a positive correlation between age and the level of awareness of CAMD systems.

Table 30: **Table 5.7a Paired T sample test for age and awareness**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	age - Awareness 1	-1.231	1.478	.290	-1.828	-.634	-4.246	25	.000
Pair 2	age - Awareness 4	-11.038	31.678	6.213	-23.833	1.756	-1.777	25	.088

5.9b Age and perceived ease of use

The hypothesis under test here was

H2b: states that there is a positive relation between age and the perceived ease of use of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for age of the respondents as far as perceived ease of use of CAMD systems was concerned.

It is clear from the two sample t-test results that the age of the respondents is a significant factor in the determinant of the perceived ease of use of CAMD systems or not. This can be verified by comparing the absolute t values obtained with t table value, that is |-2.453|>2.060, therefore we accept the claim that there is a positive correlation between age and the perceived ease of use of CAMD systems. This can be supported by the findings in the literature that there some doctors who are comfortable with the traditional methods and therefore resist change.

Table 31: **Table 5.7b Paired T sample test for age and perceived ease of use**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	age - easeofuse1	-.769	1.275	.250	-1.284	-.254	-3.077	25	.005
Pair 2	age - easeofuse2	-.923	1.440	.282	-1.505	-.341	-3.012	25	.003
Pair 3	age - easeofuse3	-1.038	1.455	.285	-1.626	-.451	-3.108	25	.001
Pair 4	age - easeofuse4	-.269	1.402	.275	-.835	.297	-.979	25	.337
Pair 5	age - easeofuse5	-.808	1.789	.351	-1.530	-.085	-2.302	25	.030

5.9c Age and perceived usefulness

The hypothesis which was under investigation was

H4b: states that there is a positive relation between age and the perceived usefulness of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for age as far as perceived usefulness on usage of CAMD systems was concerned.

From the two sample t-test results conducted by the SPSS system, table 4.7c below, the t value is |-4.831| which is greater than the t table value of 2.060 obtained from the universal t table at a df of 25 and 95% confidence level. This indicates that the age of the respondents is not a significant factor in the determinant of the perceived usefulness of medical systems; therefore we reject the claim that there is a positive correlation between age and the perceived ease of use of medical diagnostic systems.

Table 32: **Table 5.7c Paired T sample test for age and perceived usefulness**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	age - usefulness 1	-1.038	1.280	.251	-1.555	-.521	-4.137	25	.000
Pair 2	age - usefulness 2	-1.846	1.156	.227	-2.313	-1.379	-8.146	25	.000
Pair 3	age - usefulness 3	-.731	1.687	.331	-1.412	-.050	-2.209	25	.037

5.9d Age and perceived information quality

The hypothesis which was under investigation was

H5b: states that there is a positive relation between age and the perceived information quality of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for age as far as perceived information quality of information as far as medical diagnostic systems was concerned.

It is clear from the two sample t-test results that the age of the respondents is not a significant factor to consider when evaluating the perceived information quality of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-4.540|>2.060, therefore we reject the claim that there is a positive correlation between age and the perceived ease of use of medical diagnostic systems.

Table 33: **Table 5.7d Paired T sample test for age and perceived information quality**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	age - informationquality1	-1.308	1.379	.270	-1.865	-.751	-4.835	25	.000
Pair 2	age - informationquality2	-1.077	1.294	.254	-1.599	-.554	-4.244	25	.000

5.9e Age and Ict skills

The hypothesis which was under investigation was

H6b: states that there is a positive relation between age and the level of ICT Skills of users of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for age as far as ICT skills on usage of medical diagnostic systems was concerned**.**

It is clear from the two sample t-test results that the age of the respondents is not a significant factor in the determinant of the Ict Skills required on usage of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-7.121|>2.060, therefore we reject the claim that there is a positive correlation between age and the ICT Skills of usage of medical diagnostic systems.

Table 34: **Table 5.7e Paired T sample test for age and ICT Skills**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	age - ICTSkills1	-1.423	1.102	.216	-1.868	-.978	-6.586	25	.000
Pair 2	age - ICTSkills2	-2.000	1.414	.277	-2.571	-1.429	-7.211	25	.000
Pair 3	age - ICTSkills3a	-1.962	1.311	.257	-2.491	-1.432	-7.630	25	.000
Pair 4	age - ICTSkills3b	-1.731	1.251	.245	-2.236	-1.226	-7.055	25	.000

5.9f Age and perceived trust

The hypothesis which was under investigation was

H7b: states that there is a positive relation between age and the perceived trust of use of medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean response for age as far as perceived trust on use of medical diagnostic systems was concerned**.**

It is clear from the two sample t-test results that the age of the respondents is a significant factor in the determinant of the perceived trust required on usage of medical systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-2.062|<2.064, at a degree of freedom of 24 and confidence level of 95%, therefore we accept the claim that there is a positive correlation between age and the perceived trust of usage of medical diagnostic systems. This shows that in order to achieve appropriate adoption of medical diagnostic systems, the views of young doctors should be put into consideration.

Table 35: **Table 5.7f Paired T sample test for age and perceived trust**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	age - PerceivedTrust1	-1.040	1.172	.234	-1.524	-.556	-4.037	24	.000
Pair 2	age - PerceivedTrust2	-.400	1.354	.271	-.959	.159	-1.077	24	.153
Pair 3	age - PerceivedTrust3	-.320	1.492	.298	-.936	.296	-1.072	24	.294

5.10 Specialty and Computer Assisted Medical diagnostic systems use

5.10a Specialty and perceived ease of use

The hypothesis under test here was

H2c: states that there is a positive relation between specialty and the perceived ease of use of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for specialty of the respondents as far as perceived ease of use of CAMD systems was concerned**.**

Table 36: **Table 5.8a Paired T sample test for specialty and perceived ease of use**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			

Pair 1	Specialty - easeofuse1	-.769	1.883	.369	-1.530	-.009	-2.083	25	.048
Pair 2	Specialty - easeofuse2	-.923	2.058	.404	-1.754	-.092	-2.287	25	.031
Pair 3	Specialty - easeofuse3	-1.038	2.181	.428	-1.920	-.157	-2.427	25	.023
Pair 4	Specialty - easeofuse4	-.269	2.146	.421	-1.136	.597	-.640	25	.528
Pair 5	Specialty - easeofuse5	-.808	1.939	.380	-1.591	-.024	-2.123	25	.044

It is clear from the two sample t-test results that the specialty of the respondents is a significant factor in the determinant of the perceived ease of use of CAMD systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-1.912|<2.060, at a degree of freedom of 25 and a confidence level of 95%, therefore we accept the claim that there is a positive correlation between specialty and the perceived ease of use of CAMD systems.

5.10b Specialty and perceived usefulness

The hypothesis which was under investigation was

H4c: states that there is a positive relation between specialty and the perceived usefulness of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for specialty as far as perceived usefulness on usage of CAMD systems was concerned**.**

From the two sample t-test results conducted by the SPSS system, the t value is |-2.046| which is almost same as the t table value of 2.060 obtained from the universal t table at a df of 25 and 95% confidence level. This indicates that the specialty of the respondents is a significant factor in the determinant of the perceived usefulness of CAMD systems; therefore we accept the claim that there is a positive correlation between age and the perceived ease of use of medical diagnostic systems.

Table 37: **Table 5.8b Paired T sample test for specialty and perceived usefulness**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Specialty - usefulness1	-1.038	2.506	.491	-2.051	-.026	-2.113	25	.045
Pair 2	Specialty - usefulness2	-1.846	2.034	.399	-2.668	-1.025	-2.529	25	.000
Pair 3	Specialty - usefulness3	-.731	2.491	.489	-1.737	.275	-1.496	25	.147

5.10c Specialty and perceived information quality

The hypothesis which was under investigation was

H5c: states that there is a positive relation between specialty and the perceived information quality of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for specialty as far as perceived information quality of information as far as CAMD systems was concerned.

It is clear from the two sample t-test results, table 5.8c below, that the specialty of the respondents is not a significant factor to consider when evaluating the perceived information quality of CAMD systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-2.866|>2.060, therefore we reject the claim that there is a positive correlation between specialty and the perceived ease of use of CAMD systems.

Table 38: **Table 5.8c Paired T sample test for specialty and perceived information quality**

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Speciality - informationquality1	-1.308	2.055	.403	-2.138	-.478	-3.245	25	.003
Pair 2	Speciality - informationquality2	-1.077	2.208	.433	-1.969	-.185	-2.487	25	.020

5.10d Specialty and Ict skills

The hypothesis which was under investigation was

H6c: states that there is a positive relation between specialty and the level of ICT Skills of users of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any statistical significant between the mean response for specialty far as ICT skills on usage of CAMD systems was concerned.

It is clear from the two sample t-test results, table 4.8d below, that the specialty of the respondents is not a significant factor in the determinant of the ICT Skills required on usage of CAMD systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-4.149|>2.060, therefore we reject the claim that there is a positive correlation between specialty and the ICT Skills of usage of CAMD systems.

Table 39: **Table 5.8d Paired T sample test for specialty and ICT Skills**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Specialty - ICTSkills 1	-1.423	2.318	.455	-2.359	-.487	-3.130	25	.004
Pair 2	Specialty - ICTSkills 2	-2.000	2.332	.457	-2.942	-1.058	-4.372	25	.000
Pair 3	Specialty - ICTSkills 3a	-1.962	2.088	.409	-2.805	-1.118	-4.791	25	.000
Pair 4	Specialty - ICTSkills 3b	-1.731	2.051	.402	-2.559	-.903	-4.304	25	.000

5.10e Specialty and perceived trust

The hypothesis which was under investigation was

H7c: states that there is a positive relation between specialty and the perceived trust of use of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for specialty as far as perceived trust on use of CAMD systems was concerned.

It is clear from the two sample t-test results, table 4.8e below, that the specialty of the respondents is a significant factor in the determinant of the perceived trust required on usage of CAMD systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-1.402|<2.060, therefore we accept the claim that there is a positive correlation between specialty and the perceived trust of usage of CAMD systems. This implies that depending on the specialty, the information in these CAMD systems is seen to be more credible.

Table 40: **Table 5.8e Paired T sample test for specialty and perceived trust**

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Speciality - PerceivedTrust 1	-1.080	2.100	.420	-1.947	-.213	-2.571	24	.017
Pair 2	Speciality - PerceivedTrust 2	-.440	2.434	.487	-1.445	.565	-.904	24	.375
Pair 3	Speciality - PerceivedTrust 3	-.360	2.464	.493	-1.377	.657	-.730	24	.472

5.10f Specialty and perceived user satisfaction

The hypothesis which was under investigation was

H8c: states that there is a positive relation between specialty and the perceived user satisfaction of use of computer assisted medical diagnostic systems.

A two sample t-test was conducted to establish whether there was any significant difference between the mean responses for specialty as far as perceived user satisfaction on use of CAMD systems was concerned.

It is clear from the two sample t-test results, table 4.8f below, that the specialty of the respondents is a significant factor in the determinant of the perceived user satisfaction required on usage of CAMD systems. This can be verified by comparing the absolute t values obtained with t table value, that is |-2.028|<2.060, therefore we accept the claim that there is a positive correlation between specialty and the perceived user satisfaction of usage of CAMD systems. This was also supported by the display of appreciation of CAMD systems at the field level as data was being collected. For instance the anesthetist found less importance to such systems compared to a general practitioner or even a pathologist.

Table 41: **Table 5.8f Paired T sample test for specialty and perceived user satisfaction**

		Paired Differences					T	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Specialty - UserSatisfaction 1	-1.038	2.289	.449	-1.963	-.114	-2.314	25	.029
Pair 2	Specialty - UserSatisfaction 2	-1.423	2.212	.434	-2.317	-.530	-2.280	25	.003
Pair 3	Specialty - UserSatisfaction 3	-1.080	2.397	.479	-2.069	-.091	-2.253	24	.034
Pair 4	Specialty - UserSatisfaction 4	-.840	2.322	.464	-1.798	.118	-1.809	24	.083
Pair 5	Specialty - UserSatisfaction 5	-.720	2.424	.485	-1.721	.281	-1.485	24	.151

5.11 FRAMEWORK DESIGN

5.11.1 FRAMEWORK AFTER VALIDATION

The findings indicate that the chi square value is 6.089 compared to the conventional value of 0.211 at a degree of freedom of 2 and level of significance of 0.168. This implies that there is a positive relationship between awareness of computer assisted medical diagnostic systems and usage.

There was a significant positive relationship between the perceived ease of use and usage as reflected by a coefficient of 6.134 (chi square expected was 3.49).Also, there was a significant positive relationship between the savings/cost and usage as reflected by a chi square value of 4.083 (chi square expected was 0.211).

There was a significant positive relationship between the perceived usefulness and usage as reflected by a chi square observed value of 11.78 (chi square expected was 3.49).There was a significant positive relationship between the perceived information quality and usage as reflected by a coefficient of 12.689 (expected chi square value was 3.49). This means that an increase in perceived information quality leads to an increase in intention to use.

There was a significant positive relationship between the ICT skills or experience and usage as reflected by a chi square observed of 6.99 (chi square expected was 4.168).

There was a significant relationship between the satisfaction and usage as reflected by a coefficient of 7.96 (chi square expected was 3.49).

Also, there was a significant relationship between perceived trust and usage as reflected by a chi square observed of 12.15 (chi square expected was 3.49).

From the two sample t-test results, we find that the gender of the respondents is not a significant factor in their determinant on whether they would adopt the CAMD systems or not. This can be verified by comparing the absolute t values obtained with t table value, for the hypotheses h1a, h2a, h4a, h5a and h7a, that is h1a- tested gender and awareness, h2a tested gender and perceived ease of use, h4a tested gender and perceived usefulness, h5a tested gender and perceived information quality and h7a gender and perceived trust. For all these hypotheses the t test carried out established that there was no significant statistical correlation, therefore gender has a moderating factor has been found to be insignificant in coming up with a framework for adoption of CAMD systems.

From the two samples t-test results above, the age of the respondents can be a factor in their determinant on whether they would adopt the CAMD systems or not. This can be verified by comparing the absolute t values obtained with t table value for h2b- age and perceived ease of use, h6b which is age and ICT skills and h7b which is age and perceived trust. From these hypotheses, it was establish that age has a statistical influence when we consider perceived ease of use, ICT skills and perceived trust. Even from the literature review it was highlighted that some practitioners are inclined to the traditional methods that they find change to the modern ways to be challenging, Nazi Kim M, 2003.

From the analysis of specialty as a moderating factor viz a viz several constructs, it was established that there was a significant influence of specialty of the respondents as far as intention to use computer assisted medical diagnostic systems and eventually adoption was concerned. Specialty was found to influence positively awareness, perceived usefulness, perceived trust and user satisfaction. Therefore, specialty had to be put into consideration in the final framework design.

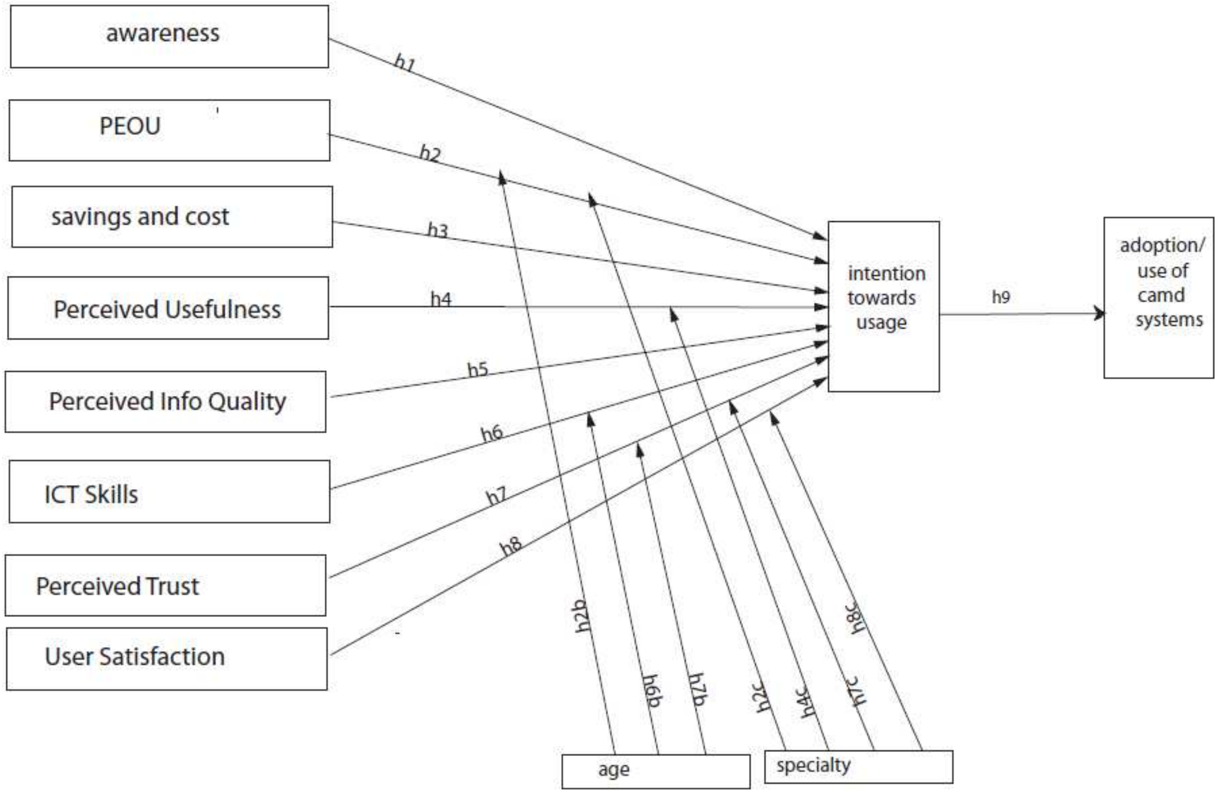


Figure 10: Framework after validation

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Chapter overview

This chapter presents findings of the research objectives as well as makes necessary recommendations. Based upon the findings, this final chapter will first present findings on the research objectives, theoretical and practical implication of the research will be presented. Next, the academic contribution of the study will be presented followed up by the research limitations and recommendations for future research.

6.2 Research objectives

6.2.1 Analyze different frameworks

The various frameworks TRA, PBC, TAM and UTAUT were analyzed and from the various constructs of the framework awareness, perceived ease of use, savings/cost, perceived usefulness, perceived information quality, ICT skills, User satisfaction and perceived trust were derived. This constructs became the basis of our conceptual framework besides the demographic factors which are there moderating factors.

6.2.2 Identify the gaps in the current framework that need to be addressed.

From the various frameworks, constructs were derived. These constructs were investigated in the Kenyan context in order to come up with a framework tailor made for our Kenyan environment. The frameworks have been used elsewhere effectively to facilitate adoption of computer assisted medical diagnostic systems but the same has not reciprocated in Kenya. To identify the gaps, the moderating factors were investigated independently for each construct.

6.2.3Framework for adoption of computer assisted medical diagnostic systems in Kenya.

Presented in figure ten above has been developed by assessing computer assisted medical diagnostic systems in Kenya. This framework has eight constructs that were found to significantly influence the adoption of CAMD systems. Other than that the various demographic factor that influence these constructs positively have also been identified. Some of the constructs exhibited stronger significance than others. This framework is generic and can be used in any developing country with modification of the moderating factors to suit such a country.

6.3Theoretical and Practical Implication

This study has significant implications for research on computer assisted medical diagnostic systems. The results suggests that factors identified are capable of providing adequate explanation of adoption decision making processes by medical doctors in Kenya of CAMD systems. The study validates the constructs of awareness, perceived ease of use, savings/cost, perceived usefulness, perceived information quality, ICT skills, User satisfaction and perceived trust derived from various frameworks. That is perceived ease of use and perceived usefulness from Davis (1989), user satisfaction and perceived trust from UTAUT.

The study has shed light on some of the main factors which influence use of medical diagnostic systems. Findings from this research can be considered by developers and even the ministry which are directly responsible for developing medical diagnostic systems. Also the international health bodies such as WHO and USAID can use the framework to come up with systems that will be accepted in the developing countries.

6.4 Limitations and suggestions for future research

In the process of conducting this research study, a number of limitations were encountered. Insufficient funds hindered the research to the extent that information from remote locations, other than Nairobi were not collected creating an assumption that all doctors have the same perception of CAMD systems regardless of where they are based. This may have caused some skewness as far as the representation of doctor's perception is concerned.

Further research should also investigate the adoption of CAMD system from the patients' perspective as these systems are developed for both doctors and patients use. Our study concentrate majorly on doctors point of view but it is necessary also the patients are involved for a complete adoption.

REFERENCES

Adams, D. A; Nelson, R. R.; Todd, P. A. (1992), "Perceived usefulness, ease of use, and usage of information technology: A replication", MIS Quarterly 16: 227–247, http://portal.acm.org/citation.cfm?id=119641.119631

Ajzen, I., & Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behavior. Journal of Personality and Social Psychology, 27(1), 41-57.

Ajzen, I. (2002). Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior. Journal of Applied Social Psychology, 32, 665-683.

Armitage CJ, Conner M (2001). Efficacy of the theory of planned behaviour: A meta-analytical review. Br. J. Soc. Psychol., 40: 471– 499.

Bagozzi, R.P. (2007), "The legacy of the technology acceptance model and a proposal for a paradigm shift." Journal of the Association for Information Systems 8(4): 244–254.

Baker EW, Al-Gahtani SS, Hubona GS (2007). The effects of gender and age on new technology implementation in a developing country: Testing the theory of planned behavior (TPB). Info. Technol. People.20(4): 352 - 375

Chau, P (1998). An Empirical Assessment of A Modified Technology Acceptance Model. Journal of Management Information Systems, vol. 13 no.2

Cooper, D.R and Schindler, P.S (2011). "Business Research Methods", 11th edition. McGraw-Hill Publishing, Co. Ltd. New Delhi- India.

Creswell, J.W., 2003. Research Design: Qualitative, Quantitative and Mixed Method Approach, second Edition, sage publication, Inc.

Cronbach, L. (1970). Essentials of Psychology Testing. New York, NY: Harper & Row

Davis, F. D. "Perceived Usefulness, Perceived Ease-of-Use and User Acceptance of Information Technology," MIS Quarterly (13:3), 1989, pp. 319-339.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly, 13, 31-340.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). User acceptance of computer technology: A comparison of two theoretical models. Management Science, 35(8),

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavior impacts, International Journal of Man Machine Studies, 38, 475-487.Dillon, A & Morris, M (1996), user acceptance of new technology: theories and models. In M. Williams (ed.) *Annual Review of information science and technology*, vol. 31, Medford NJ: Information Today, 3-32.

Dwivedi, Y & Weerakkody, V (2007). "Examining the factors affecting the adoption of broadband in the kingdom of Saudi Arabia". Electronic government, An international journal, (4:1), pp 43-58.

Fishbein, M. (1967). Attitude and the prediction of behavior. In M. Fishbein (Ed.), Readings in attitude theory and measurement (pp. 477-492). New York: Wiley.
Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior : An introduction to theory and research. Reading, Mass. ; Don Mills, Ontario: Addison-Wesley Pub. Co.
Hansen T, Jensen JM, Solgaard H (2004). Predicting online grocery buying intention: a comparison of the theory of reasoned action and the theory of planned behavior. Int. J. Info. Manage., 24: 539–550.
Heeks R. Health information systems: failure, success and improvisation. Int J Med Inform. 2006 Feb;75(2):125–37.
Inmaculada B, Roca V, Escrig A and Carlos J. *Human Resource Flexibility as a Mediating Variable Between High Performance Work Systems and Performance* .Journal of Management 2008 34: 1009 originally published online 20 May 2008 DOI: 10.1177/0149206308318616
Making the eHealth Connection' Bellagio conference on National eHealth Policies. WHO conference at Bellagio, Italy, 2008.
Miyaki, A.D. and Fernandez, A. (2001). Consumer perceptions of privacy and security risks for online shopping. Journal of consumer affairs, 35(1), 27-44.
Mugenda O.M, Mugenda A.G (2003). Research Methods; *Quantitative & Qualitative Approaches*. Nairobi-Kenya, Acts Press.
Nazi Kim M. The journey to e-Health: VA Healthcare Network Upstate New York (VISN 2) Journal of Medical Systems. 2003 Feb;27(1):35–45.
Pagliari C. et al. What is eHealth: a scoping exercise to map the field. Journal of Medical Internet Research. 2005 Mar 31; 7(1):e9.
Ramnarayn P, Roberts G C, Coren M (2006), 'Assessment of the potential impact of a reminder system on the reduction of diagnostic errors: a quasi-experimental study', *BMC Med Inform Decis Mak*, *vol* 6(1), pp 22
Ryu S, Ho SH, Han I (2003). Knowledge Sharing Behavior of Physicians in Hospitals. Expert Syst. Appl., 25: 113–122.
Serenko, A. and Bontis, N. (2009), ''Global ranking of knowledge management and intellectual capital academic journals'', Journal of Knowledge Management, Vol. 13 No. 1, pp. 4-15.
Shirky C, "And nothing to watch: bad protocols, good users: in praise of evolvable systems," NetWorker: The Craft of Network Computing, Vol 2, No. 3, 1998, pp. 48-ff
Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. Management Science, 42(1).
Tan W, Cater-Steel A, and Toleman M, " Implementing IT service management : a case study focusing on critical success factors." Journal of Computer Information systems, vol 50(2),Feb 2009,

Tornatzky L.G & Fleischer M (1990), *The Processes of Technological Innovation*, Lexington Books, Lexington, Massachusetts.

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for dirrections? gender, social influence, and their role in technology acceptance and usage behavior. MIS Quarterly, 24(1), 115-139.

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

Vingtoft S, Veloso M, Fuglsang-Frederiksen A, Johnsen B, Vila A, Barahona P, Fawcett P, Schofield I, Ljørring A, Otte G, Sieben G, Talbot A, Liguori A and Nix W, ESTEEM, an AIM project incorporating advanced information processing functions, Telematic services and an international medical audit into clinical EMG practice, Proceedings of the Twelfth International Congress of the European Federation for Medical Informatics MIE-94, 256-260, 1994.

Wells S, Jackson R. Online management of cardiovascular risk in New Zealand with PREDICT-Getting evidence to the "moment of care". HCIRO. 2005;March:1–6.

White C, Sheedy V, Lawrence N. Patterns of computer usage among medical practioners in rural and remote Queensland. Aust J Rural Health. 2002 Jun; 10(3): 137-46.

APPENDIX 1: QUESTIONNAIRE FOR AN MSC (INFORMATION SYSTEM) PROJECT.

This questionnaire is used as a tool to collect data to assist in assessing the level of adoption of medical diagnosis systems in Kenya and establish ways to encourage further adoption. The medical diagnosis systems intended to be studied are basically used for diagnostic support. The diagnostic support pertains to the ability of the system to generate diagnostic hypotheses from a set of patient data.

These systems could either be web based or not. They vary from online web based systems to call systems for instance 'call a doc' and many others.

The questionnaire is basically a multiple choice whereby you are provided to fill in your opinion by ticking where appropriate. It adopts a Likert scale whereby:

- 1 is for very strongly agreeing/ very strongly believe so
- 2 is for strongly agreeing/ strongly believe so
- 3 is for agreeing/ believe so
- 4 is for strongly disagreeing/ strongly do not believe so
- 5 is for very strongly disagreeing/ very strongly do not believe

1.0 DEMOGRAPHIC INFORMATION

Name: …… ……………………………………………………………….

Today's date: …………………………..

Address: ……………………………

Code: ……………………………

City: ……………………………

Name of hospital ……………………..............

Telephone: work; ………………… mobile: ……………………….

Age: Above 20 ( )

Above 30 ( )

Above 40 ( )

Above 50 ( )

Sex: □ Female □ Male

Specialty ……………………………………..

2.0 AVAILABLE FRAMEWORK

2 a) Is there a framework in place for adoption of medical diagnostic system?

Yes : □ **No** □ **I have never seen one** □

2 b) If yes, briefly describe it ……………………………………………………………….
…………………………………………………………………………………………….

3.0 THE VARIOUS CONSTRUCTS

3 a) Awareness

	1	2	3	4	5
(i) I am aware of medical diagnostic systems being offered	[ ]	[ ]	[ ]	[ ]	[ ]
(ii) Medical diagnostic systems are available for use	[ ]	[ ]	[ ]	[ ]	[ ]
(iii) Mention some that you have ever used …………………………………………….					
(iv) Is there any effort the government has put in place to enhance the use of these systems?	[ ]	[ ]	[ ]	[ ]	[ ]
(v) How frequently do you encounter awareness drives for such systems?	[ ]	[ ]	[ ]	[ ]	[ ]

3 b) Perceived ease of use

	1	2	3	4	5
(i) How do you perceive the easiness of use of medical diagnostic systems?	[ ]	[ ]	[ ]	[ ]	[ ]
(ii) How easily can you obtain the information you require on a medical diagnostic system?	[ ]	[ ]	[ ]	[ ]	[ ]
(iii) Do you receive the information you expected?	[ ]	[ ]	[ ]	[ ]	[ ]

(iv) Do Medical diagnostic systems provides conclusive diagnosis in a single interaction? [ ] [ ] [ ] [ ] [ ]

(v) In your opinion how easy is the use of these systems to the general public? [ ] [ ] [ ] [ ] [ ]

3 c) Savings/ cost

(i) Do you think it is cost effective (time, money) to use medical diagnosis systems? Yes [ ] No [ ]

(ii) By using these systems patients save money? Yes [ ] No [ ]

(iii) By using these systems doctors save time? Yes [ ] No [ ]

3 d) Perceived usefulness

1 2 3 4 5

(i) Would the use of CAMD systems enhance accuracy in doctor's diagnosis? [ ] [ ] [ ] [ ] [ ]

(ii) Would the use of these systems enable doctors to have an idea of what patient's are suffering from? [ ] [ ] [ ] [ ] [ ]

(iii) Would there be lack of necessary information if these systems were not used? [ ] [ ] [ ] [ ] [ ]

3 e) Perceived information Quality

1 2 3 4 5

(i) Is the information provided relevant in the day to day diagnosis cases encountered? [ ] [ ] [ ] [ ] [ ]

(ii) Is the information provided in a manner easy to utilize? [ ] [ ] [ ] [ ] [ ]

3 f) ICT Skills and experience

	1	2	3	4	5
(i) How technical are medical diagnostic systems in terms of ICT advancement?	[ ]	[ ]	[ ]	[ ]	[ ]
(ii) How easily can you access the information from the internet?	[ ]	[ ]	[ ]	[ ]	[ ]

(iii) Would you use medical diagnostic systems to

	1	2	3	4	5
Gather information?	[ ]	[ ]	[ ]	[ ]	[ ]
Send for a message for a query?	[ ]	[ ]	[ ]	[ ]	[ ]

3 g) User satisfaction

	1	2	3	4	5
(i) Do you obtain the information you expected these medical diagnostic syst ems?	[ ]	[ ]	[ ]	[ ]	[ ]
(ii) Is the interface provided user friendly?	[ ]	[ ]	[ ]	[ ]	[ ]
(iii) Is the current internet speed fast as you desire?	[ ]	[ ]	[ ]	[ ]	[ ]
(iv) How is the convenience of internet availability when you require it?	[ ]	[ ]	[ ]	[ ]	[ ]
(v) How do you rate the security of these systems in terms of sensitivity of your personal information?	[ ]	[ ]	[ ]	[ ]	[ ]

3 h) Perceived trust

	1	2	3	4	5
(i) How reliable do you rate information from these	[ ]	[ ]	[ ]	[ ]	[ ]

systems?

(ii) Would you use medical diagnostic systems to submit personal information if needed? [ ] [ ] [ ] [ ] [ ]

(iii) What is the level of confidence you have to these systems in terms of concealing your private information? [ ] [ ] [ ] [ ] [ ]

4.0 RECOMMENDATIONS

Would you increase the use of these medical diagnostic systems in your day to day operations if the above constructs are taken care of?

Yes : □ **No** □ **I will think about it** □

Are there any other constructs that has not been taken care of?

Yes : □ **No** □

If yes please mention ………………………………………………………………………..............................

……………………………………………………………………………………………………….....