ADOPTION OF HEALTH INFORMATION TECHNOLOGY (HIT) IN BANGABANDHU SHEIKH MUJIB MEDICAL UNIVERSITY: LONE MEDICAL UNIVERSITY IN BANGLADESH

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A THEMATIC PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE (BIOMEDICAL AND HEALTH INFORMATICS) FACULTY OF GRADUATE STUDIES MAHIDOL UNIVERSITY 2014

Thematic Paper
entitled

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was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Science (Biomedical and health informatics)
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ACKNOWLEDGEMENTS

It is a great pleasure to express my heartfelt gratitude and honor to my advisor Assist. Prof. Saranath Lawpoolsri, M.D.,Ph.D. for her patience, motivation, enthusiasm and all round supervise during my research work. Her guidance helped me in all the time of study and writing of this thematic paper.

My sincere thanks also goes to the rest of my co-advisor Dr. Boonchai Kijsanayotin, M.D., Ph.D., Dr. Ngamphol Soonthornworasiri, Ph.D. and the chair of the thematic paper defence committee Dr. Daorirk Sinthuvanich, M.D., for their encouragement, insightful comments, suggestions and co-operation.

I owe sincere and earnest thankfulness to the Rockefeller Foundation, Faculty of Tropical Medicine, Mahidol University and the department of Public Health and Informatics, Bangabandhu Sheikh Mujib Medical University for providing fund and giving me the opportunity to enter the field of Health Informatics.

I would like to show my gratitude to the faculty members, the academic staffs, my friends, colleagues and classmates for their kind encouragement and co-operation throughout the study period.

Last but not least, I would like to thank my wife Dr. Tania Tasnova & my lovely son Md. Tasneef Haque Khan (Manif), for their inspiration, patience and sacrifices.

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ABSTRACT

Bangabandhu Sheikh Mujib Medical University (BSMMU) is the prime medical university in Bangaldesh . BSMMU is planning to implement health information technology (HIT); which is the most vital component of the revolution in the field of health care system in the University.

This cross sectional study aims to know the current knowledge, usage, resource and attitude towards HIT among the end users of Bangabandhu Sheikh Mujib Medical University, Bangladesh by using the UTAUT model. The target population was the staff of BSMMU and the sample size was 400.

The study results suggested that the staff of Bangabandhu Sheikh Mujib Medical University are ready to adopt health information technology.

KEY WORDS: INFORMATION TECHNOLOGY / BANGABANDHU SHEIKH MUJIB MEDICAL UNIVERSITY / IT ACEPTENCE MODEL

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LIST OF ABBREVIATIONS

BBS	Bangladesh Bureau of Statistics
BI	Behavioral Intention
BSMMU	Bangabandhu Sheikh Mujib Medical University
CBO	Congressional Budget Office
CD-ROM	Compact Disc Read-Only Memory
CITL	Center for Information Technology Leadership
C-TAM-TPB	Combined Technology Acceptance Model and Theory Of Planned Behavior
DGHS	Directorate General Of Health Services
EE	Effort Expectancy
EMR	Electronic Medical Records
FC	Facilitating Conditions
HDI	Human Development Index
HIS	Health Information System
HIT	Health Information Technology
ICT	Information And Communication Technologies
IDT	Innovation Diffusion Theory
IPGMR	Institute Of Postgraduate Medical Research
IS	Information System
IT	Information Technology
MDG	Millennium Development Goal
MM	Motivational Model

LIST OF ABBREVIATIONS (cont.)

MMR	Maternal Mortality Rate
MOH	Ministry of Health
MPCU	Model of PC Utilization
PE	Performance Expectancy
PEOU	Perceived Ease-of-Use
PHC	Population and Housing Census
PU	Perceived Usefulness
SCT	Social Cognitive Theory
SI	Social Influence
SN	Subjective Norm
SPSS	Statistical Packages for Social Science
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
US	United States
UTAUT	Theory of Acceptance and Use of Technology
WHO	World Health Organization

CHAPTER I
INTRODUCTION

1.1 Background

Health information technology (HIT) is a new wave of revolution in the health care field. Many hospitals/clinics/governments around the world are trying to implement this HIT to curtail expenses and to improve quality of care in the health sector. But if the users failed to adopt a new technology, it may contribute little of expecting outcome. To get maximum benefit from HIT Bangabandhu sheikh Mujib Medical University (BSMMU) is going to implement HIT in near future.

Bangabandhu Sheikh Mujib Medical University (BSMMU) is the sole medical university in Bangladesh, which is the centre for state-of-the art service, education, and research in medicine. The BSMMU also takes the academic leadership for all medical institutions under its authority. It was established in December 1965 as an Institute of Postgraduate Medical Research (IPGMR) and in the year 1998 the Government of Bangladesh adapted IPGMR into a Medical University for intensifying the facilities for advanced medical education and research in the country. Currently, BSMMU is providing its services through 1,500 bedded hospital by 43 departments under 5 faculties.About 3,800 person are working for this university as a teacher/physician, nurse as others supporting staff(1).

At present, BSMMU lacks the services of a structured data collection system, which seriously hamper the quality of its services. Information collection, storage, and retrieval are done manually using paper based system. To increase health care quality & administrative efficiencies, to reduce medical error, health care expenditures & paperwork, and to expand access to reasonable health care with limited workforce & resource(2),BSMMU is planning to implement health information technology; which is the most vital component of the revolution in the field of health care system in the University.

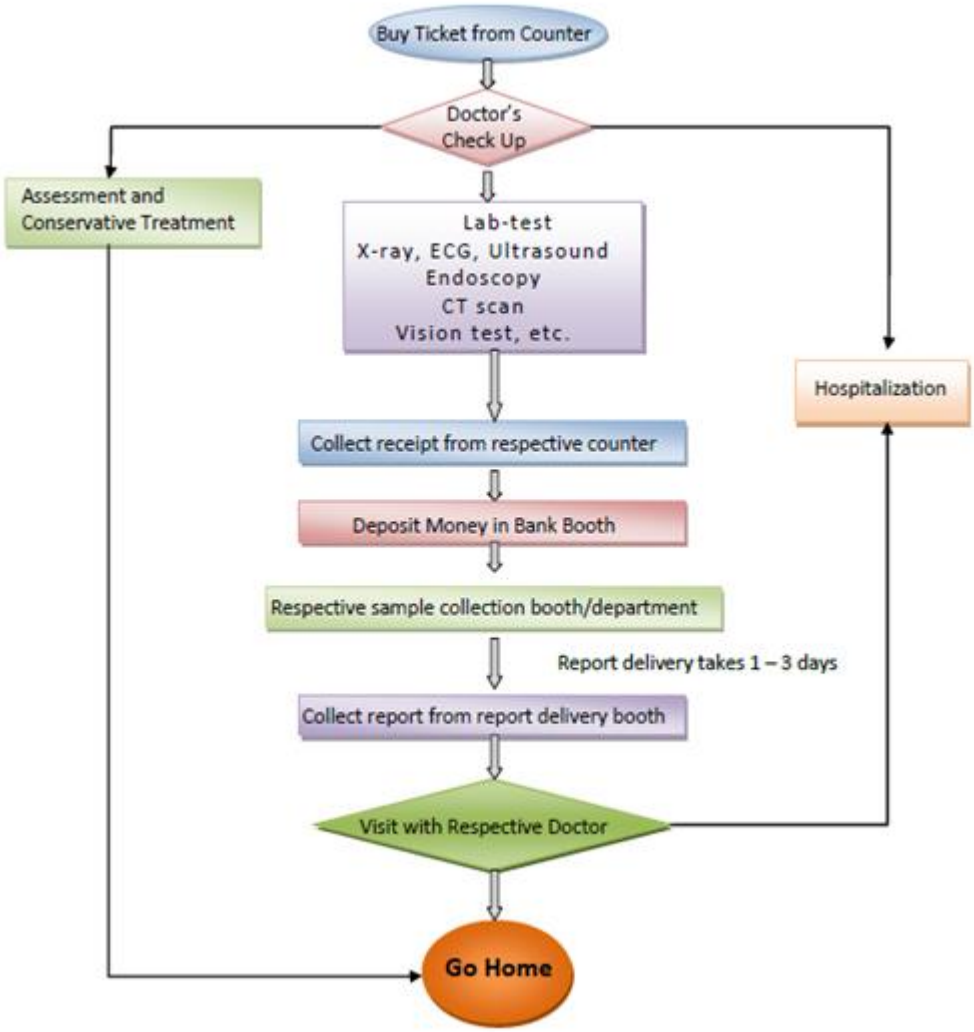

Figure 1.1 Current OPD workflow at BSMMU

From past major health IT project implementation in many countries show that one of the key factors of success of technology is user acceptance. There are several factors promoting to this failure. The main reasons for the lack of success is the poor knowledge of the socio-technical aspect of IT, the lack required IT expertise among health care personals, the low level of acceptance of the system to users, the republic's financial crisis, the fast technology, social and political changes. The knowledge on health IT among the users is the factors that positively effect on their acceptance and use, The knowledge on HIT will helps to design of the health information system, as well as effective application and evaluation process(3-5).

For improving health personnel performance particularly during the time of the major health system reform, there are challenges associate with developing and implementing an information system(6). It is known that users knowledge and organizational change is essential for the successful accomplishment of the system design, development and implementation, (7, 8). The BSMMU is going to implement HIT in the near future. However, the users' level of knowledge, current status of health IT use has not been assessed. This knowledge includes how health IT breaches to health service facilities in the University, how people currently use health IT, their knowledge on HIT, and what are factors that affect IT acceptance and use. Study in this area is needed in the Bangabandhu sheikh Mujib Medical University (BSMMU), prior to implement health information technology.

1.2 Research question

Are the staffs of Bangabandhu Sheikh Mujib Medical University ready to adopt the health information technology (HIT)?

1.3 Objectives of the study

- To describe health IT resource in BSMMU.
- To measure current status of IT usage in BSMMU.
- To assess the basic knowledge on HIT among the staffs of BSMMU
- To measure their behavioral intention towards HIT.
- To measure the most influential factors for the intention and usage of HIT by BSMMU staffs.

1.4 Significances of this study

The outcome of this study will be helpful for the concern authority for proper planning, designing and policymaking regarding of health information technology in BSMMU.

1.5 Conceptual Framework

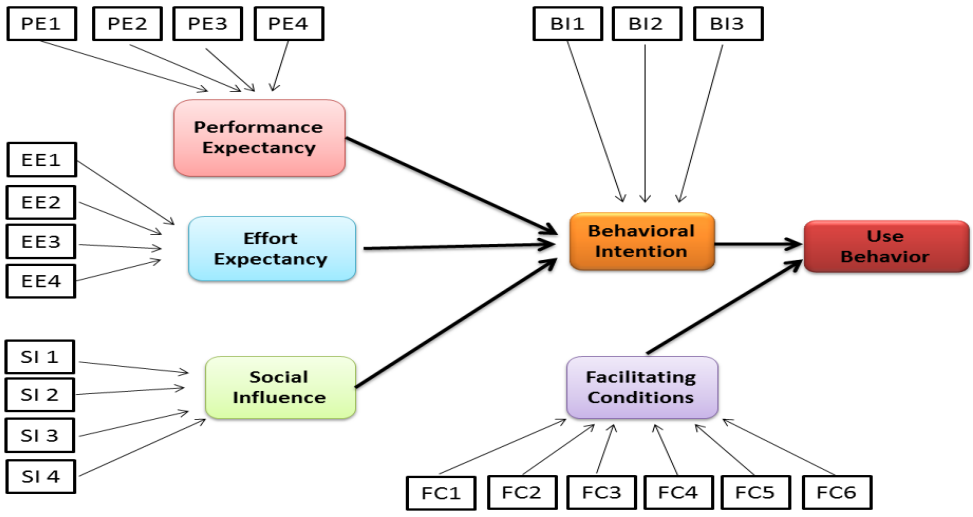

Figure 1.2 Conceptual Framework

CHAPTER II
LITERATURE REVIEW

2.1 Bangladesh: Demographic and Health Status

The People's Republic of Bangladesh, is a South Asian country, bounded on the west, north and north-eastern by India, on the southeast by Myanmar, and on the south by the Bay of Bengal(9).

Figure 2.1 Map of Bangladesh

Dhaka is the capital of Bangladesh and the national language is Bangla, which is spoken and understood by all. Most of Bangladesh is low flat land which consists of alluvial soil. The most important feature of the land is the vast network of large and small rivers, that are of paramount importance to the socio-economic life of the country.

Muslims account for nearly 90 percent of the population of Bangladesh, Hindus make up about 9 percent, and other religions make up the remaining 1 percent.(10)

The Mughals ruled the state of the 13th century until the 18th century, when the British took over and administered the subcontinent until 1947. Bangladesh was part of India during the British rule. In 1947, the independent states of Pakistan and India were created. The territory of Bangladesh was part of Pakistan. Bangladesh emerged on the world map as an independent national March 26, 1971, after a nine-month war of liberation(11, 12).

Bangladesh is a unitary state and parliamentary democracy (13). Every five years direct elections are held for the unicameral parliament known as Jatiya Sangshad, in which all citizens/voters aged 18 or over, can vote. It currently has 350 members (including 50 seats reserved for women) elected in single-member constituencies. The honorable President formally appointee the Prime Minister, she or he must be a Member of Parliament who has the confidence of the majority. The head of state is the President, but also solemnly in his / her elected position(14).

The climate of Bangladesh is dominated by seasonal monsoons. The country has a warm season, from March to June with high moisture, a little cooler, but still warm and tropical rainy season from July to early October and a cool dry winter from November to the end February. The fertile delta is prone to frequent natural disasters, such as floods, cyclones, tidal bore, and famine.

For administrative purposes, the country consists of 7 divisions, 64 districts, and 545 upazilas/thanas (15). During the global financial crisis, Bangladesh has been able to attain a GDP growth of over 6 per cent on average. GDP presented a robust growth rate of 6.7 percent in fiscal year (FY) 2010 to 2011 compared to 6.1 percent recorded in 2009-2010. The largest contributor in the agricultural sector is crop and horticulture (11 percent), followed by fisheries (4 percent). The average per capita income in Bangladesh went up to $848 in the 2011-2012 fiscal year from $ 599 in the fiscal year 2007-2008 (16).

Despite the rapid economic growth, Bangladesh is still struggling to emerge from poverty. About 43.3% of the population still living on less than $1.25 per day which means below the international poverty line. HDI value of Bangladesh is

0.515 in the low human development category for 2012. Position of Bangladesh is 146th, out of 187 countries and regions. The rank is shared with Pakistan. HDI of Bangladesh has improved from 0.312 to 0.515, between 1980 and 2012, an upsurge of 65 per cent or average annual increase of about 1.6 percent(17).

The country is undergoing a demographic transition. The continuous decline in the rate of natural growth lead to an increase in the lowest population in the coming decades. In comparison with other countries in the region, this population growth rate places Bangladesh in an intermediate position between low-growth countries, such as Thailand, Sri Lanka, and Myanmar, and medium-growth countries, such as India and Malaysia(18)

In the world Bangladesh is the world's 8th most populated country (19), and 11th position in population density. According to the results of 2011 Population and Housing Census (PHC), the country's population was approximately 149.8 million, with a population density of 1,015 persons per square kilometer(18).

Health is seen as a fundamental right in the Constitution of Bangladesh. It has achieved significant evolution in current years in improving the health of its people. The total expenditure on health was only 3.7% of GDP in 2011(20). As reported by the WHO, the number of doctors in Bangladesh only 3 per 10 000 inhabitants in 2009(21). The fertility rate is currently 2.55, which is less than India (2.58) and Pakistan (3.07). The population of Bangladesh is comparatively young, with 34% aged 15 or less and 5% of 65 years or more. Life expectancy at birth is estimated at 70 years for men and women in 2012(22). According to WHO report on 2013, under five mortality rates 46 per 1000 live births, adult male (15-60yrs) mortality rate 163 per 1000 population and Adult female (15-60yrs) mortality rate 136 per 1000 population. In Bangladesh MMR decreased to 240 from 574 deaths per 100,000 in 1990-2010(23). Bangladesh Maternal Mortality Survey done in 2010 and data show a rate of 194 deaths per 100,000 live births. This rate of change regarding MMR points out that the country is on the right way to achieve MDG 5 of dropping MMR by three quarters, between 1990 and 2015, but to achieve the target, we must reduce the MMR to 143 deaths per 100 000 live births in 2015.

2.1.1 Health information system in Bangladesh

Bangladesh entered into the field of Internet, and information and communication technologies (ICTs) in the late 1990s. The health information system (HIS) in Bangladesh has been reforms in recent years. The Government of Bangladesh has a strong motivation to implement of HIS through utilization of ICT and e-health systems in the country.

Health information technology cultures in public sector are not good enough yet. Directorate General of Health Services has recently started developing EMR which is the basic to ICT in health. Ministry of Health & Family Welfare have started to use information systems for vital decisions, like logistics supply, analysis of the performance of health personnel and staff management. The Management Information System (MIS) division of DGHS recently distributed computers system and Internet connections near about 800 centers of Government Health Services in Bangladesh. They also provided mobile phones to all district hospitals and upazila to deliver mobile health services of the phone, thus our citizens can take health suggestions for free from doctors working in government health centers. Health related data are now available on GIS map. Amongst the private enterprises, the mobile companies are more visible providing tele-consultation where any person can call on a provided mobile phone number and can consult with physicians directly(24-26).

2.2 Health Information Technology: Benefits and Problems

Health information technology (HIT) is, “the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making”(27).

Similar to administrations in other developing countries, the BSMMU authority has recognized the potential advantage of IT to improve health of the people, and have embraced the technology (28-30).

The widespread adoption of HIT could solve lots of the difficulties facing the U.S. health care organization. But information on whether or not HIT improves quality, cuts needless expenditures and advances the access to care is distinctly mixed. Some claimed benefits cannot be produced, while other benefits will be recognized with further investigation. Federal lawmakers and public health promoters claim that wide range of the use of HIT will reduce expenses and increase quality (31).

A report from US Congressional Budget Office (CBO) in 2008 said, "No aspect of health IT entails as much uncertainty as the magnitude of its potential benefits"(32). In 2005, the RAND Corporation presented a remarkably significant article on the probable benefits of HIT. The RAND investigators said that per year HIT could save up to $77 billion , 15 years after execution(33). Likewise, the Center for Information Technology Leadership (CITL) assessed that if all system modules are capable to interconnect with all other modules could save $78 billion per year(34).

Activists for health information systems state that HIT would cut unnecessary medical imaging and laboratory tests(35). Many studies showed that care in the United States about 30 percent of medical is wasteful(36). The quantity of waste is reduced by using more HIT is still unidentified. A previous study reported that during an office visit about one third of the information needs of a doctor is not available due to the lack of records and lab reports (37, 38).

HIT promoters believe that HIT will helps to advance clinical medicine. They debate the incorporation of databases of patient treatments through large people will improve the results of research that provides information about the treatments that work best. They expect that the information gathered from the exploration of the general population over time will determine the effectiveness of different treatments(39). Richard Platt says that collecting supporting information on the results of treatment depend not only a significant financing in equipment, but also appropriate training for staff to learn how to use equipment. In addition, treatments and consequences of patient information should be monitored for a number of years (40). In concept, information sharing could help investigators to learn about diseases treatments (41). Knowledge gathered from HIT could even be combined with decision-support tools to support physicians and link gaps in their knowledge (42).

Advocates believe HIT could improve quality of care (43). A minor but growing number of health caregiver invites patient the facility to accumulate and manage their individual records securely online, making them available to patients and their doctors. Isolated data management facilities are already used by people with complex medical circumstances. Supporters also hope that using specially designed software, EMRs will help to improve safety by care giver to easily identify adverse drug reaction and to relate the treatment of an individual patient against standard guideline. Already these types of software are available and a lot of retail dispensaries use HIT to check medications against-indicated. It is too early to say with confidence that the HIT contribute to improve patient safety (44). However, advocates believe that HIT has the potential to improve the quality of health care, along with the reduction of medical errors(45).

The researchers are still confusing whether HIT helps to progresses patient outcomes. An evaluation of computerized clinical decision-support systems established that such systems are helpful, but the authors concluded that the effects on patient consequences are not consistent and there is unavailable of enough evidence (46). Initially the Harvard School of Public Health found from their study that quality improvements from EMRs are not adequate. For example, facilities with advanced HIT systems meet the highest standards of practice approved by the federal government 87.8 percent of the time, related to 85.9 percent for businesses without HIT system for the treatment of patients with heart failure. Furthermore, the average duration of hospital stay for patients with advanced HIT systems was reduced to 5.5 days compare with 5.7 days for hospitals without such HIT systems (47).

HIT may increase the chance of new errors during providing health care services. One previous study shows in what way new errors raised by an EMR directed to an incorrect diagnosis at an educational medical center. The patient's care team realized after three days that the entered wrong results into their EMR system. Several sources mentioned as contribute to the error are: weak links between computer systems, inadequate protections for patient identification errors, data disintegration and poor working process of the hospital. Because no one person was responsible for the care of the patient, each person who provided care blindly trust on the (false) EMR (48, 49).

HIT may affect positively or negatively on the flow of information. Though HIT increases the information flow in positive ways, it can also diminish other. A study in the Netherlands found that the computerized physician order entry "compromised" synchronization and feedback mechanisms in nurse-physician relationship.(50)

2.3 The Socio-technical Aspects of IT

As a recent article indicated, that HIT is “a vehicle, not a destination”(51). An article in the Journal of the American Medical Association says that set up HIT systems in a hospital or clinic, is more complex than linking a computer to the internet or installing software from a CD-ROM (52). Several studies have estimated that nearly 40% of the development of information technology in different sectors, including the health sector, were counted failures or have been discarded. In addition, the number has remained unchanged for at least 30 years (53-55). Although there is no number in the proportion of the implementations of information systems succeed or fail, the investigation of this issue offer a range of figures. They believe that a fifth to a quarter of the system of developed countries (IS) projects fall into the category of total failure and one-third to three-fifths fall into the category of partial failure, and only a drop the minority in the category of success. In addition, there is no data to support the idea that the failure rates in developing countries should be lower than those in developed countries (56).

Littlejohns et al (2003) described the causes for failure of a big computerized health information system (HIS) project in South Africa due to inadequate understanding of the users to the new system and in underestimation of the difficulty of the health system (57). In another study, Lorenzi and Riley (2003) noted that human problems, both individual and organizational levels are another reason that contributes to letdowns in the implementation of information systems. They are classified reasons for information system failure such as effective communication, the underestimation of the complexity, opportunity creep, organizational issues, technological issues and management issues. They emphasized the significance of

organizational change management in the development and implementation of new information systems (58-60).

Jones (2003) concluded in his article about the implementation of an electronic patient record (EPR) in a hospital of united kingdom that the implementation of an EPR system involves a complex interaction of technical and organizational issues, within a wider healthcare system context (32). Usually, all these studies conclude that to the success of the system, understanding human factors, the socio-technical aspect of computing, especially individuals and organizations are essential (61, 62).

2.4 IT acceptance and use models

Information Systems field, adoption of the technology has become one of the most important topics. Most important factors to adoption of computer technology are beliefs, attitudes and intentions. Whereas recent pictures have concentrate on clarifying the act of using computers, the role of learning to use the computer which needs to adopt the overall process. Insufficient knowledge may restrict the acceptance and use of a preferably useful system (63).

Many models have been established to describe users' adoption and use from the time when computer and information technology have been starting widespread use. Study on Information Technology acceptance and use has been done widely by IT managers simultaneously.

There are many IT acceptance and use models are established from various disciplines. These are the Theory of Reasoned Action (64, 65), Technology Acceptance Model (66), Motivational Model (67), Theory of Planned Behavior (68), a combination of Technology Acceptance and Theory of Planned Behavior models (69), Model of PC Utilization (70), Innovation Diffusion Theory (71, 72), and Social Cognitive Theory(73). The Unified Theory of Acceptance and Use of Technology (UTAUT) model draws upon and integrates technology acceptance and use related eight previously developed models (74).

Theory of Reasoned Action (TRA)

Ajzen and Fishbein (1975 & 1980) were recommended the theory of reasoned action (TRA). It is a model for the guess of behavioral intention, associating expectations of attitude and behavior. The three general components of TRA are attitude (A), behavioral intention (BI), and subjective norm (SN). According to TRA, one's behavior is depends on his/her motive or plan to behave. The Behavioral intention (BI) of a person depends on the person's attitude (A) about the behavior and subjective norms (SN). If a person anticipates to perform a behavior then it is likely that he will do it (BI = A + SN) (64, 65).

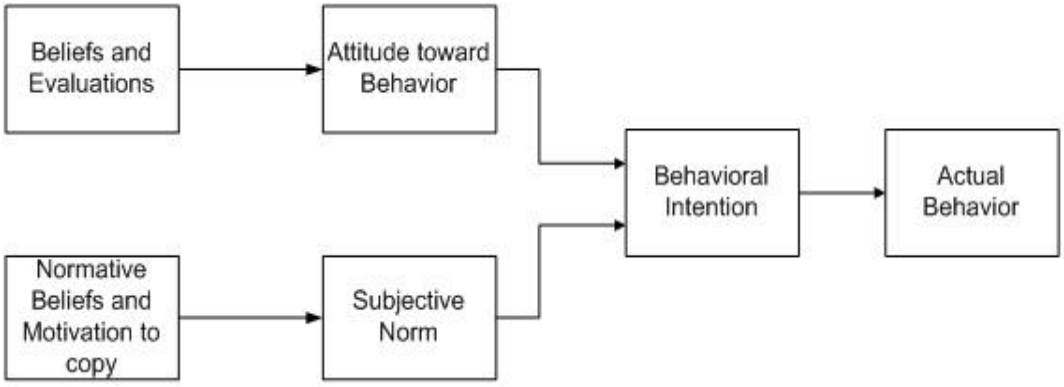

Figure 2.2 Theory of Reasoned Action (TRA)

Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was developed by Fred Davis and Richard Bagozzi. It is the extensions of Ajzen and Fishbein's theory of reasoned action (TRA). According to TAM model, when users are offered with a different technology, many issues effect on their decision about accept that new one. Likewise, perceived usefulness (PU) and perceived ease-of-use (PEOU). As defined by Fred Davis, perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" and perceived ease-of-use is "the degree to which a person believes that using a particular system would be free from effort"(66).

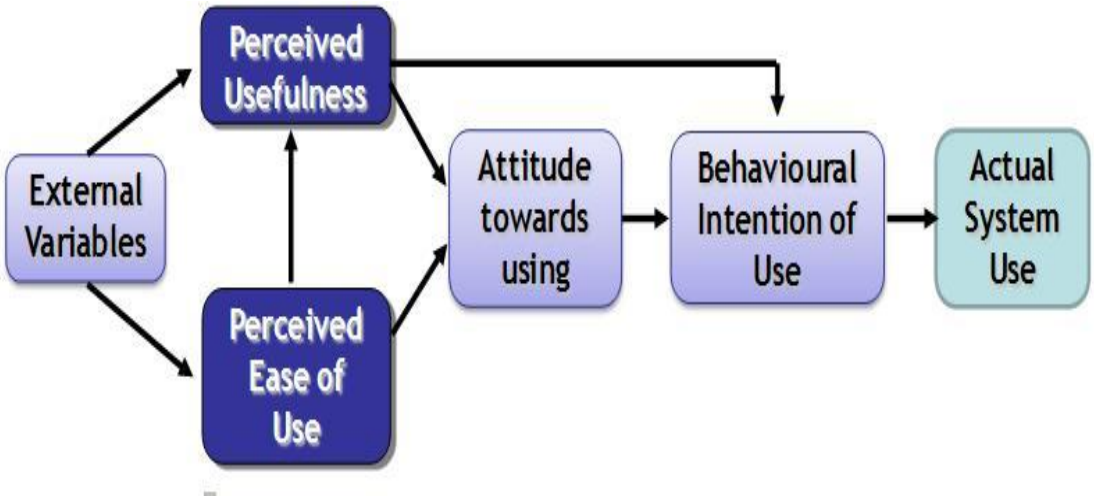

Figure 2.3 Technology Acceptance Model

TAM and TRA, both of which have robust behavioral components consider that when somebody makes an desire to perform, they will be permitted to act without restriction. In the real world, there will be a lot of limitations, like restricted autonomy of action (63).

Bakhit (2003) also adapted TAM in his doctoral thesis research that studied the use of medical information system and acceptance among the physicians of Saudi Arabia. The study focused on the analysis of the way and validated the doctors' model of acceptance (the adapted TAM model) according to most evidences of goodness of fit (75).

The adoption of information technology in the modified model (ITAM) was developed by Dixon and Stewart (2000). The model is an extension of the TAM. Nevertheless, information on how the model explains the dependent constructs in the sample studied, and information on the fit of the model was not showed in the article (76).

Motivational Model

A good number of studies in psychology domain supported general motivation theory as a clarification for behavior. The main concept of motivational theories are extrinsic motivation and intrinsic motivation. Extrinsic motivation refers to the perception that users will want to engage in an activity because it is supposed to be helpful in attaining valued consequences that are recognizable from the activity itself,

like enhanced job performance, remuneration, or promotions. Intrinsic motivation refers to the insight that users will want to engage in an activity “for no apparent reinforcement other than the process of performing the activity per se”(67). Some studies have tested the motivational theory and modified it for certain perspectives. Vallerand (1997) shows an outstanding evaluation of the significant beliefs of this theoretical base. Davis et al. (1992) used the motivational theory to understand new technology acceptance and use in the field of information science (67, 77).

Wilson and Lankton (2004) tested TAM, Motivation Model (MM) and the combined model that incorporates concepts of TAM and MM in their study of "acceptance for delivery to e-health patient modeling." They concluded that the three models pretty good results in the test of goodness of fit. However, the integrated model was not obviously statistically better than TAM and MM as they had expected (78).

Theory of Planned Behavior

The theory of planned behavior was suggested by Icek Ajzen in 1985 in his article "From intentions to actions: A theory of planned behavior." TPB is the extension of the theory of reasoned action.

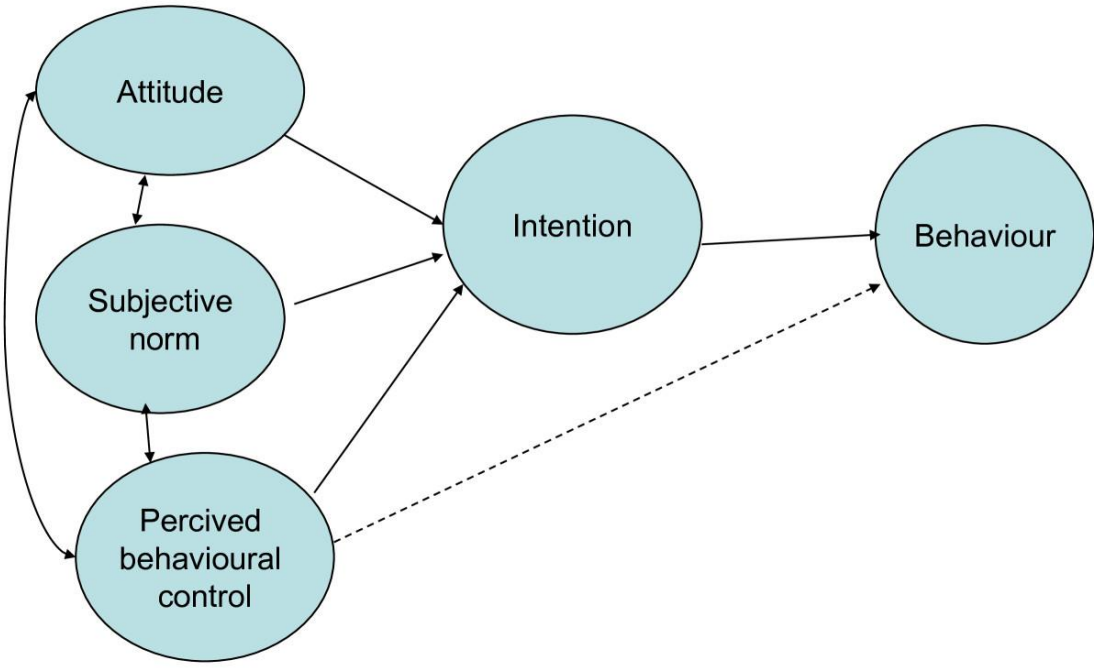

Figure 2.4 Theory of Planned Behavior

Perceived behavioral control of TPB is hypothesized to be an added element of intention and behavior. Ajzen (1991) showed an analysis of a number of studies that have applied TPB successfully to forecast intention and behavior in a variety of settings (68). TPB has been effectively used to the understanding of individual acceptance and use (79).

Combined TAM and TPB (C-TAM-TPB)

The predictors of TPB with the combination supposed usefulness from TAM make available a combination of technology acceptance and theory of planned behavior models (69). In this model, attitude toward behavior revised from TRA/TPB, Subjective norm modified from TRA/TPB, Perceived behavioral control modified from TRA/TPB and perceived usefulness modified from TAM. William et al. 2009 selected this model along with TAM and UTAUT in compare to identify their characteristics. This study shows that the complex models do not necessarily have enhanced explanation capability. On the contrary, the Technology Acceptance Model has advantage of fruitfulness and parsimony (80).

Model of PC Utilization

Model of PC Utilization adopted from Triandis's (1977) theory of human behavior, this model shows a contending viewpoint to that proposed by TRA and TPB. Thompson et al. (1991) adapted and modified Triandis's model for information system (IS) perspectives and used the model to forecast personal computer (PC) utilization. Nevertheless, the nature of the model makes it appropriate to predict individual acceptance and use of a range of information technology. Thompson et al. (1991) wanted to predict usage behavior rather than intention (70). There are 6 predictors of PC use like: long term consequences, job fit, complexity, effect toward, social factors and facilitating conditions. Long-term consequences indicates in "the outcomes that have a pay-off in the future"(70). Job-fit with PC use states to the "extent to which an individual believes that using a technology can enhance the performance of his or her job"(70). As reported by Rogers and Shoemaker (1971), complexity is "the degree to which an innovation is perceived as relatively difficult to understand and use."(70) As Triandis, affect toward use is "feelings of joy, elation, or pleasure, or depression,

disgust, displeasure, or hate associated by an individual with a particular act"(70). Another predicting social factors are "the individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others, in specific social situations"(70). The sixth predictor, facilitating conditions refers as an "objective factors in the environment that observers agree make an act easy to accomplish"(70). Regarding IS perspective, "provision of support for users of PCs may be one type of facilitating conditions that can influence system utilization"(70).

Innovation Diffusion Theory

Since the 1960s Innovation Diffusion Theory (IDT)(71) has been used to study a variety of innovations, as of agricultural tools to organizational innovation. Moore and Benbasat (1991) modified the features of innovations within information systems, offered and developed a set of concepts that could be applied to study individual technology adoption. Moore and Benbasat (1996) established support for the predictive rationality of these innovation features (81). The main concept of IDT's are Relative Advantage, Ease of Use, Image, Visibility, Compatibility, Results and Voluntariness of Use. Relative advantage is the degree to which an innovation is apparent as being better than previous. Ease of use, the extent to which an innovation seems as easy to use. Image is mentioned to as the degree to which the use of an innovation is supposed to improve the image or position in the society of a person. Visibility is the magnitude to which one can perceive others using the system of the organization. Compatibility indicates the extent to which an innovation is supposed as dependable with present values, necessities and past experiences of prospective adopters. Result demonstrability means the perceptibility of the outcomes of using an innovation, containing observability and communicability. Finally Voluntariness of Use refers to how the use of the innovation is seeming as or voluntary free will (72).

Social Cognitive Theory

Social cognitive theory (SCT) was suggested by Neal E. Miller and John Dollard in 1941 which reduce the work in the field of social learning theory (82). Social cognitive theory is one of the most important theories of human behavior (83).

Compeau and Higgins used and modified SCT to the perspective of computer utilization (84, 85). Compeau and Higgins' model studied computer use but the nature of the model and the basic theory allows it to be comprehensive to adoption and use of information technology in overall (84). Main indication factors are consequence of expectations performance, result of anticipations personal, self-efficacy, affect and anxiety. Outcome expectations performance talk about to the consequences of behavior. More specifically, the performance expectations for the jobs related consequences. Outcome Expectations Personal is the personal extents of the behavior. Precisely, personal expectations deal with his esteem and sense of execution. Assessment of one's capability to use a technology (e.g. computer) to do a specific task is self-efficacy. Affect refers as personal likes for a specific behavior (e.g. computer use). Lastly, Anxiety is emotional condition of triggering nervous or emotional when it comes to execution a behavior.

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

In 2003 Venkatesh et al. suggested a new IT adoption and use model, which intended to merge eight major IT adoptions and use models named The Unified Theory of Acceptance and Use of Technology (UTAUT) model. This model was developed to help future study in the field of information technology acceptance behavior, based on this integrated model, researchers are able to identify other factors that influence user behavior. The theory consists with the four fundamental constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) to determine of usage intention and behavior (74).

Since the beginning of UTAUT model, many studies in different field areas have used and modified the model to study the adoption of IT and IT use in wireless network technology(86), tablet PCs(87), course management(88), 3G mobile(89), instant messenger(90), social networking(91), information kiosks(92), e-government service(93), internet banking(94), mobile banking(95)etc.

Perceived behavioral control of TPB is hypothesized to be an added element of intention and behavior. Ajzen (1991) showed an analysis of a number of studies that have applied TPB successfully to forecast intention and behavior in a variety of settings (68). TPB has been effectively used to the understanding of individual acceptance and use (79).

Combined TAM and TPB (C-TAM-TPB)

The predictors of TPB with the combination supposed usefulness from TAM make available a combination of technology acceptance and theory of planned behavior models (69). In this model, attitude toward behavior revised from TRA/TPB, Subjective norm modified from TRA/TPB, Perceived behavioral control modified from TRA/TPB and perceived usefulness modified from TAM. William et al. 2009 selected this model along with TAM and UTAUT in compare to identify their characteristics. This study shows that the complex models do not necessarily have enhanced explanation capability. On the contrary, the Technology Acceptance Model has advantage of fruitfulness and parsimony (80).

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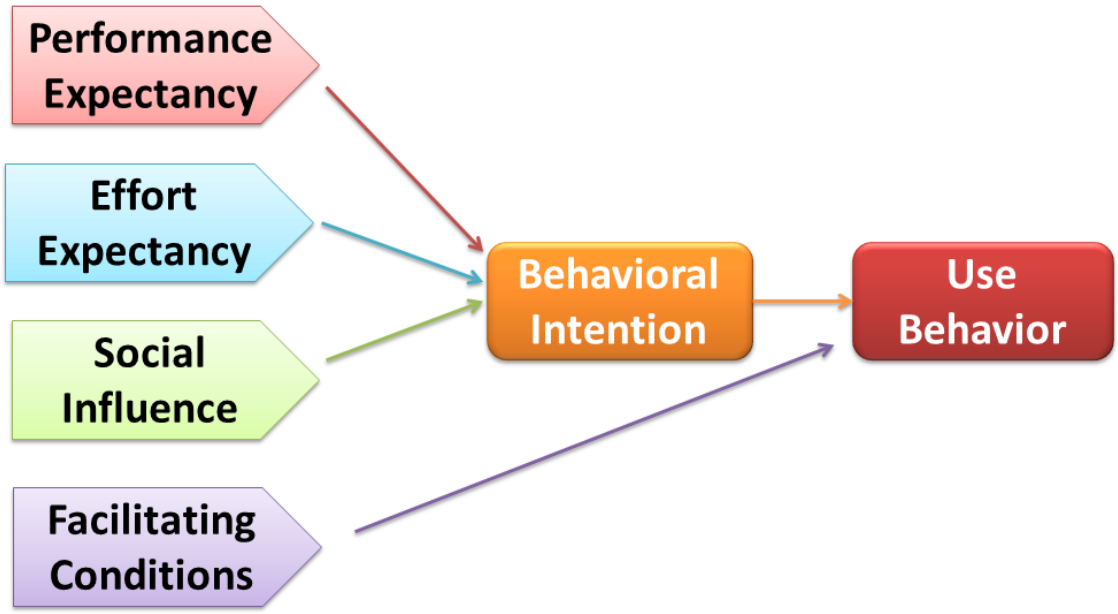


Figure 2.5 Unified Theory of Acceptance and Use of Technology (UTAUT) Model

The Unified Theory of Acceptance and Use of Technology (UTAUT) will be used for this study because of its advantages. The capability of TAM and TAM2 to predict technology adoption success is only 30% and 40%. UTAUT has integrated the 32 variables found in the previous eight models (TRA, TPB, TAM, MM, C-TPB-TAM, MPCU, IDT and SCT) into four main construct. The predictive efficiency of UTAUT model is 70%, which is more better than others model (96).

Saber et.al (2005) uses four basic construct of the UTAUT model (performance expectancy, effort expectancy, social influence, and facilitating conditions) to study the probability of adoption of the technology e-learning (in the process of re-accreditation) nursing administrators in the U.S. Nevertheless, the study reported descriptive statistics for the use of e-learning courses and proposed to further explore the relationship between intention and factors UTAUT model in subsequent analysis. The results of their study indicated that the sample was lower than expected for the use of online learning resources (97).

Chang et al. (2007) performed a study of the acceptance of the pharmacokinetics of Taiwanese doctors support systems based clinical decisions (DSS). They used the basic concepts of the UTAUT model in their study. They found that the expectation of performance and duration of exercise had a significant

influence, while social influence had a marginal effect on the intention to use DSS. These three elements assumed for 28% of the variance of behavioral intention. Moreover, facilitating conditions exhibited a minimal influence on MAS consumer behavior and 43% of the variance of the DSS use behavior is explained by the behavioral intention and facilitating conditions.(98)

Al Awadhi S. et al. (2008) conducted a study by using the unified acceptance and use of technology (UTAUT) model to find out the factors that regulate the acceptance of e-government services in a developing country, like Kuwait. 880 students were interviewed using a modified form of the UTAUT model. Experimental data shows that performance expectancy, effort expectancy and peer influence regulate students' behavioral intention. In addition, facilitating conditions and behavioral intentions regulate the use of e-government services students (99).

Kijsanayotin B. et al. (2009) used a revised form of the unified theory of acceptance and use of technology (UTAUT) structural model to recognize the factors that effect on health IT acceptance in community health centers in Thailand and certify the existing IT adoption model in the context of health care in developing countries. The research model analysis suggests that IT adoption is influenced by performance expectation, effort anticipation, social inspiration and voluntariness. The use of IT is anticipated by prior experience, the intention to use the system, and to facilitate conditions (5, 100).

Oye et al. (2011) used this UTAUT model in a pilot study which was conducted at the university of Jos Plateau state, Nigeria to understand why people accept or reject new information technology. In their study performance expectancy exerted the utmost influential factor for the acceptance and use of ICT by the respondents.(101)

Paul Juinn Bing Tan (2013) used UTAUT model in his study is to determine core factors of university students’ that effect on their attitudes toward computerized placement tests and corresponding use. It assesses four factors that influence students' attitudes: performance expectancy, effort expectancy, social influence, and facilitating conditions. The results confirm that three out of the four core constructs (factors) have a significantly positive effect on behavioral intention, which in turn have a positive correlation to actual use and this study result also support

the UTAUT model as a good tool to measure the factors that influence to adopt new technologies(102).

All of these works adjusted the model to adapt in their context of study and showed high reliability and validity of UTAUT model constructs.

CHAPTER III
METHODOLOGY

3.1 Type of study

This will be a descriptive type of cross sectional survey.

3.2 Places of Study

This study will be conducted in the Bangabandhu Sheikh Mujib Medical University of Bangladesh.

3.3 Study Population

The study population will be all the staffs of Bangabandhu Sheikh Mujib Medical University working in various different. Approximately 3,836 staffs were working permanently for Bangabandhu Sheikh Mujib Medical University in 43 departments under 5 faculties. Among them 1,109 were physicians/teachers, 826 were nurses and rest of them were considered as others supporting staffs.

Inclusion Criteria

1. Male and Female, Age ≥ 18 years old
2. Staffs, who were working as permanent basis in the Bangabandhu Sheikh Mujib medical University, Bangladesh
3. Agree to participate in the study

Exclusion Criteria

Staffs, who were working as daily basis and temporarily or contract basis were excluded.

3.4 Sample Size and Sampling Technique

The sample size in this study was determined on the basis of Taro Yamane's formula.(103) Since our population size 3,836 sample size 363 was suggested according to Taro Yamane's formula with 95% CI and 5% error. With this suggested sample size 10% more was added for non-respondents and missing data. So, in this study final sample size was 400.

Table 3.1 Taro Yamane's Formula

$$n = \frac{N}{1+N\,(e)^2}$$

n = Sample size
N=Total Population
e= Error

According to sample size calculation, 400 staffs were asked to participate in the study. The respondents were purposively selected according to their convenience, stratified by their type of professional and department, as follows:

Table 3.2 Stratified Sampling

Description	Number	Staff Percentage	Sample	Sample Percentage
Physician/Teacher	1109	29	116	29
Nurse	826	22	88	22
Others Supporting staffs (Technician and Administrative staff)	1901	49	196	49
Total	**3836**	**100**	**400**	**100**

3.5 Instrument

The survey questionnaire was adopted after minimal modification from prior studies in which this instrument had been verified and showed sufficient reliability and validity (100, 104-108) (see Appendix for the actual survey questionnaire.)

Questions regarding respondents' demography, IT resources, IT usage and knowledge measures were drawn from previous studies in Thailand, (104, 109, 110) and questions based on attitudes toward IT were drawn from the study from which the UTAUT model was developed.(74) These UTAUT-based questions consist of the measures of the constructs of performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC) and behavioral intention (IN).(74)

After a small modification in context of Bangladesh, the entire implemented survey questionnaire was translated in Bangla language. To ensure the correctness of the questionnaire the questionnaire was translated from English to Bangla by two expertise person, then again Bangla to English translation was done by different two persons.

Questionnaire components

Section A: participant demography

To collect demographic information, the BSMMU's personnel were asked to fill out about the participants' gender, age, education, field of work, currently used computer systems, local area network availability and internet connectivity.

Section B: IT use

The measures of IT use consisted of one question asking frequency of use and a set of 10 questions asking three different types of use associating with jobs in BSMMU including providing health care and report production tasks, administrative and management tasks, and communication and information searching tasks. Four questions related to provision of care and routine reporting, three questions related to management and administration and the last three questions focused on information searching and collaboration with colleagues. Responses for all questions about types

of computer use will be given in a format of five-point scale ranging from 1 (never perform this task), 2 (never use a computer), 3 (sometimes use a computer), 4 (often use computer) and 5 (always use a computer). This section also contained one question asking participants to quantify their own IT experience (Experience).

Previous study done in Thailand showed that these three types of IT use constructs had acceptable reliability and reasonable internal consistency as recommended by Nunnally (111).

Section C: IT Knowledge

A set of 20 questions relating to basic IT knowledge was used to measure "IT knowledge". These items also drawn from previous study done in Thailand. The answer options for the knowledge questions were "true," "false" and "don't know." The internal consistency reliability of the scale from previous studies was relatively high with a Cronbach's alpha of 0.80.(104, 109)

Section D: Attitudes toward IT

To measures of attitude towards IT were drawn from several studies after minimal modification, that developed from the UTAUT model(74). Some studies show that to assess the usage behavior on information technology, the UTAUT model is an sufficiently valid and reliable tool (5, 93, 101, 102, 105-108).

In this study, with 5-point Likert-type answer scales extending from 1 (strongly disagree) to 5 (strongly agree) a set of 23 questions were used (see Appendix # for the actual survey questionnaire). Of these 23 items, four items assessed the degree to which an individual believes that using IT will support him/her to achieve improvements in job performance; the performance expectancy (PE) . Four items evaluated the degree of ease associating with use of IT; the effort expectancy (EE). Another four items evaluated the degree to which an individual identifies that others believe he /she should use IT; the Social Influence (SI). There were six items for evaluating the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of IT; the facilitating conditions (FC). The final three items evaluated behavioral intention to use IT; the intention (IN).

Pilot test

The study questionnaire was verified for consistency, simplicity and ease of accomplishment using a convenience sample of 14 individuals. Among the subjects 8 were doctor, 4 were non-medical person and 2 were nurses. Except the nurses (diploma) all were graduate person, working in different institutions. The results of the pilot test suggested minor drafting changes. The survey questionnaire was found to be easy to understand and took approximately 20 minutes to complete. The revised questionnaire was used for data collection.

3.6 Data Collection

Data were collected by using self-administered structured questionnaire. The investigator team was hand on the questionnaire and was available to answer questions regarding the study.

Two data collector was employed by researcher and they were trained properly for this study. The principle investigator and trained data collector were met with the departmental head for asking permission to invite the randomly selected staffs of the Bangabandhu Sheikh Mujib Medical University (BSMMU) to participate in this study (permission from BSMMU authority was taken for data collection). Following steps were followed there:

- The respondents were purposively selected according to their convenience according to stratified sampling.
- The study was described, if participants concern to participate the study. Those selected participants was described the detail regarding the study precisely by interviewers about objectives of the study and benefits of the study. The description of all detail about the project was described in local language.
- The time was open for question from participants until the participants clearly understands the detail of the study.

• After participants make decision to participate in the study, the interviewers gave the participant information sheet and inform consent from was asked to assure for participating in the study.

• If the participants voluntary make decision to participate in the study, the participants was asked to sign inform consent.

• Though, data was be collected by self-administered structured questionnaire, if participants feel uneasy with any of the questions, s/he could skip/ refuse to answer or withdraw him/herself at any time from this study. Did not need to give any reason for the withdrawal of the consent.

• For participating in this study, no participates got any amount of money/compensation. However, all participants got a souvenir for participating in this study.

3.7 Data Analysis

Statistical Packages for Social Science (SPSS) version 18 was used for data analysis.

Descriptive analysis

Descriptive statistics were applied by means of calculating percentage, ratio or frequency, analyze the characteristics of basic demographic information based on statistics. The result will were stratified by major field of work.

Correlation and Regression analysis

Correlation and regression analysis were used to verify the influence of the four constructs of UTAUT (PE, EE, SI, and FC) towards use of technology on the behavioral intention of the university staff, towards the acceptance and use of HIT.

Regression of adoption factors on intention to use, independent variables were Performance expectancy (PE), Effort expectancy (EE) and Social influence (SI). Regression of intention to use behavior, independents variables were Facilitating condition (FC) and Behavioral intention (BI).

3.8 Ethical consideration

The study was approved by the Ethics Committee of Faculty of Tropical Medicine, Mahidol University, Thailand (MUTM 2013-050-01) (Appendix A), and Institutional Review Board (I.R.B), Bangabandhu Sheikh Mujib Medical University, Bangladesh (No. BSMMU/2013/11397 Date: 26-09-2013) (Appendix B). All participants were volunteers, and they could withdraw from anytime. The participants did not have to answer the question that they felt uncomfortable with. Name and identifiers of the participants were not recorded. Information provided would be kept confidential.

CHAPTER IV
RESULT

According to our research objectives, we present the characteristics of respondents and descriptive statistics of health IT resources, usage behavior, basic knowledge and intention toward HIT. To identify the factors that effecting to their behavioral intention and use behavior towards HIT, we used correlation and linear regression analysis.

4.1 Characteristics of Respondents

In this study, 400 samples were selected out of 3836 working staff of BSMMU. Among the participants 61% were male and 39% were female [Table 4.1]

The average age of the respondents was 32 years old (SD = 6.4, range: 19 - 54). The average age of physician (Mean 34.1, SD=5.4)) was higher than any other groups. As well as about 61% of the participants were in 26-35 years age group. Among the respondents most of them (39%) had a bachelor degree.

Table 4.1 Characteristic of respondent's

	Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**
	N (%)	**N (%)**	**N (%)**	**N (%)**
Gender:				
Male	244(61)	82(71)	6(7)	156(80)
Female	156(39)	34(29)	82(93)	40(20)

Table 4.1 Characteristic of respondent's (cont.)

		Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**
		N (%)	**N (%)**	**N (%)**	**N (%)**
Age:	Mean (SD)	32.2 (6.4)	34.1 (5.4)	30.44 (7.8)	31.8 (6.1)
	≤25 years	54(14)	0(0)	21(24)	33(17)
	26-35 years	245(61)	81(70)	48(55)	116(59)
	36-45 years	89(22)	28(24)	15(17)	46(23)
	≥46 years	12(3)	7(6)	4(4)	1(1)
Education:					
Diploma/Certificate		112(28)	2(2)	70(80)	40(20)
Bachelor degree		157(39)	91(78)	12(13)	54(28)
Master degree		67(17)	14(12)	0(0)	53(27)
Doctorate degree		5(1)	4(4)	0(0)	1(1)
Others		59(15)	5(4)	6(7)	48(24)

4.2 Health IT resource in BSMMU

Regarding health IT resources in BSMMU, 88% of the respondents reported that they have computer system and 76% reported that they have internet connection in their working place [Table 4.1]. Almost one third (29%) of the total respondents have no experiences of internet access in their daily/working life. Almost 60 % of the nurses had no experience to internet access.

The pattern of respondents' computer usage are showed in Table 4.2. More than 80% of respondents reported using a computer, but almost 50% of the nurses never used. Along with half the repondents had used a computer for more than 2 years. As well as, 50% of the respondents used computers almost everyday.Furthermore 55% respodent used PDA/Tablet/Mobile phone.

Table 4.2 Health IT resources

	Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**
	N (%)	**N (%)**	**N (%)**	**N (%)**
Availability of Computer system in working place				
Yes	352(88)	110(95)	65(74)	117(90)
No	48(12)	6(5)	23(26)	19(10)
Internet connection availability in working place				
Yes	302(76)	101(87)	47(53)	154(78)
No	61(15)	7(6)	23(26)	31(16)
Don’t know	37(9)	8(7)	18(21)	11(6)
Access to the internet:				
Never	116(29)	3(3)	52(59)	61(31)
Workplace	118(47)	64(55)	17(19)	107(55)
Home	183(46)	92(79)	26(29)	65(33)
Others	9(2)	5(4)	0(0)	4(2)
Duration of computer use:				
Never	70 (18)	0 (0)	39 (44)	31 (16)
< 1month	11 (3)	2 (2)	5 (6)	4 (2)
1-6 months	23 (6)	4 (3)	10 (11)	9 (5)
7-11 months	42 (11)	19 (16)	4 (5)	19 (10)
1-2 years	40 (10)	8 (7)	15 (17)	17 (9)
3-5 years	71 (18)	18 (16)	12 (14)	41 (21)
6-10 years	61 (15)	27 (23)	1 (1)	33 (17)
>10 years	82 (21)	38 (33)	2 (2)	42 (21)

Table 4.2 Health IT resources (cont.)

	Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**
	N (%)	**N (%)**	**N (%)**	**N (%)**
Frequency of Computer usage:				
Never	70 (18)	0 (0)	39 (44)	31 (16)
< 1 for a week	37 (9)	8 (7)	15 (17)	14 (7)
1 for a week	28 (7)	7 (6)	9 (10)	12 (6)
more for a week	69 (17)	26 (23)	19 (22)	24 (12)
everyday	142 (36)	44 (38)	6 (7)	92 (47)
more for a day	54 (14)	31 (27)	0 (0)	23 (12)
Used type if device:				
Not used	70 (18)	0 (0)	39 (44)	31 (16)
Office Desktop Computer	179 (45)	36 (31)	16 (18)	126 (65)
Home Desktop Computer	103 (26)	35 (30)	21 (24)	47 (24)
Office Notebook or laptop	14 (4)	22 (19)	0 (0)	4 (2)
Home Notebook computer	89 (22)	63 (54)	8 (9)	18 (9)
PDA/Tablet/Mobile Phone	220 (55)	114 (98)	26 (30)	80 (41)

4.3 Current status of IT usage in BSMMU

To measure HIT usage in BSMMU, we used nine statements with five-point scale ranging from 1 (never perform this task), 2 (never use a computer), 3 (sometimes use a computer), 4 (often use computer) and 5 (always use a computer). Three statements of them measured IT use for Reporting and Care giving, three statements measured IT use for management and administration and another three statements measured IT used in Communication. The average score of each construct was the average of the summed score from associated three statements. Mean score was the average of the summed score of the three statements. After that the mean score usage of HIT in BSMMU was the average of this tree main construct.

The respondents not heavily used computer technology to help them accomplish their tasks. They not frequently used computer in their job (total usage mean=2.6). Mainly they used IT for the communication purpose (mean = 3.0). The nurses were less frequently used computer.

Table 4.3 Usage Behavior of IT

	Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**	**p-value***
	Mean (SD)	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	
Report and Care giving:	2.2(1.1)	2.7(1.0)	1.7(0.8)	2.2(1.2)	*<0.001*
Recording patient information (e.g. history, physical exam, laboratory, procedure provided etc.)	2.2(1.4)	2.6(1.3)	1.9(1.0)	2.1(1.5)	
Retrieving previously recorded individual information for providing care	1.9(1.1)	2.4(1.2)	1.7(0.8)	1.6(1.1)	
Generating mandatory reports	2.6(1.7)	2.9(1.6)	1.6(1.3)	2.9(1.8)	
Administrative Use:	2.5(1.3)	3.2(0.9)	1.4(0.9)	2.5(1.3)	*<0.001*
Writing official letters, reports etc.	3.0(1.7)	3.6(1.3)	1.6(1.1)	3.3(1.7)	
Preparing presentation slides	2.6(1.7)	3.9(1.3)	1.3(1.0)	2.3(1.6)	
Performing statistical analysis	1.8(1.3)	2.1(1.4)	1.3(1.0)	1.9(1.4)	

Table 4.3 Usage Behavior of IT (cont.)

	Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**	**p-value***
	Mean (SD)	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	
Communication:	3.0(1.4)	4.1(0.8)	1.8(1.1)	2.9(1.4)	*<0.001*
Communicating with colleagues (email, etc)	2.9(1.6)	4.0(0.9)	1.6(1.1)	2.8(1.5)	
Searching for information associating with office tasks (e.g. health literature, official documents, etc.)	3.0(1.6)	4.1(1.0)	1.8(1.2)	2.9(1.6)	
Searching for information associating with personal interest.	3.2(1.6)	4.2(1.0)	1.9(1.4)	3.1(1.5)	
Total usage:	2.6 (1.1)	3.3 (0.7)	1.7 (0.9)	2.6 (1.1)	*<0.001*

*Tested by ANOVA

4.4 Basic knowledge on HIT among the staffs of BSMMU

We assessed basic IT knowledge of the respondents from the BSMMU, by using 20 questions. The questions allowed respondents to reply either “True,” “False” or “Not know”. When the knowledge score was calculated, the “Not know” responses were categorized as incorrect answers. A large number of the respondents (65%) answered at least half of the total questions correctly [Table 4.4 (a)].The average score was 11.00 (out of 20). According to this evaluation mean knowledge score of nurse (7.1) is lower than other groups. About 9% of respondents got zero score, or they could not answer all questions correctly, only 3 respondents (out of 400) got 19 scores, the highest score. More than 80% of respondents gave correct answer to the question

no. 19 (The most common cause for data error is human errors), whereas question no.5 (USB stands for Universal Serial Bus) had the least number of those who gave correct answer (14%).

Table 4.4 (a) Knowledge on HIT

	Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**	**p-value**
	N (%)	N (%)	N (%)	N (%)	
Knowledge level:					<0.001*
Correct answer >10	280(65)	95(82)	27(31)	138(70)	
Correct answer ≤10	140(35)	21(18)	61(69)	58(30)	
	Mean(SD)	**Mean(SD)**	**Mean(SD)**	**Mean(SD)**	
Knowledge Score:	11(5)	13.2(3.37)	7.1(3.4)	11.5(4.7)	*<0.001†*

*Chi-square test

†ANOVA test

Table 4.5 (b) Correctness of question on HIT

Correctness of each question:	**Total (n=400)**	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**
	N (%)	N (%)	N (%)	N (%)
1.Linux is an example of an operating system	194(49)	71(61)	22(25)	101(52)
2. Example of graphic and design software are Corel Draw, Adobe Illustrator and adobe Photoshop	230(58)	83(72)	28(32)	119(61)
3. Software is a series of instruction that make computer to do something	323(81)	109(94)	52(59)	162(83)
4. Computer virus is a software that can damage computer	320(80)	111(96)	55(63)	154(79)
5. USB stands for universal Serial Bus	56(14)	20(17)	8(9)	168(86)
6. All the information used by the processor loaded first into RAM	219(55)	66(57)	28(32)	125(64)
7. The most common use for serial or com ports is to increase processing speed.	63(16)	20(17)	6(7)	37(19)
8. Gigabyte is the unit of measurement of hard disk capacity	226(67)	98(84)	37(42)	131(67)

Table 4.5 (b) Correctness of question on HIT (cont.)

Correctness of each question:	**Total (n=400)**	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**
	N (%)	N (%)	N (%)	N (%)
9. Before a new Compact Disk(CD) can be written on, it must be formatted	125(31)	37(32)	21(24)	67(34)
10.The resolution of a monitor display unit tells us the quality of this output device	238(60)	80(69)	33(38)	125(64)
11. A function key on the keyboard to accesses help is F1	250(63)	75(65)	41(47)	134(68)
12. Scanner is an output device	102(26)	44(38)	12(14)	46(23)
13. LAN stands for Local Area Network	271(68)	95(82)	38(43)	138(70)
14. Data is transmitted using light through a fiber optic cable	204(51)	85(73)	25(28)	94(48)
15. A computer network is the term used to describe a communication system connecting two or more computers together.	296(74)	102(88)	44(50)	148(76)
16. The internet is the network of Worldwide computer networks.	262(66)	93(80)	39(44)	130(66)

Table 4.5 (b) Correctness of question on HIT (cont.)

Correctness of each question:	**Total (n=400)**	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**
	N (%)	N (%)	N (%)	N (%)
17. Integrating video, voice, music, and even graphics in a presentation is called multimedia	280(70)	103(89)	38(43)	139(71)
18. An example of e-commerce on the internet is ordering a book from on-line book store.	128(32)	44(38)	17(19)	67(34)
19. The most common cause for data error is human errors.	326(82)	105(91)	54(61)	167(85)
20. A data field is a component of a record	252(63)	87(75)	30(34)	135(69)

4.5 Behavior Intention towards HIT

Regarding behavior intention to use HIT, the data showed strongly positive (mean 4.1) attitude among all groups. Intention to use IT measured by three construct of UTAUT model. However nurses showed less intention then others. Three questions used to evaluate behavioral intention to use HIT with 5-point Likert-type response scales ranging from 1 (strongly disagree) to 5 (strongly agree)

Table 4.6 Behavior Intention

	Total (n=400)	**Physicians (n=116)**	**Nurses (n=88)**	**Supporting staffs (n=196)**	**Statistics (ANOVA)**
	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)	
Behavioral intention (BI)	4.1(0.8)	4.2(0.7)	3.9(0.7)	4.1(0.9)	p=0.031 (*df*=2)
I intend to use the computer system in the next 3 months.	4.2(0.9)	4.4(.8)	4.1(0.9)	4.2(1.0)	
I predict I would use the computer system in the next 3 months	4.0(0.9)	4.2(0.8)	3.7(0.9)	4.0(1.0)	
I plan to use the computer system in the next 3 months	4.1(0.9)	4.2(0.8)	3.9(0.9)	4.1(1.0)	

4.6 Influential factors for the intention and usage of HIT

Reliability analysis:

In this research we used UTAUT model to analyze the end-users' intention and use behavior of HIT, therefore the reliability analysis conducted to test construct on of the UTAUT model based on the collected quantitative data from BSMMU. This study confirmed whether the UTAUT model was suitable for user acceptance study. Consequently, Cronbach's Alpha had been used to test the reliability of those indicators in order to know the reliability between them; the results are shown in Table

4.6. As Cronbach's Alpha<0.35 means low reliability, 0.35<Cronbach's Alpha<0.7 means acceptable, if Cronbach's Alpha>0.7, it shows high reliability.

Table 4.7 Reliability analysis of UTAUT model (n=400)

Indicators in UTAUT construct	Cronbach's Alpha	Number of Items
Performance Expectancy	0.841	4
Effort Expectancy	0.891	4
Social Influence	0.837	4
Facilitating Conditions	0.807	6
Behavior Intention	0.869	3
User Behavior	0.889	9

As shown in table 4.6, most of indicators in the UTAUT construct show good reliability as the Cronbach's Alpha statistic for each of them is higher than 0.7. Therefore there exists high internal consistency among different indicators in the UTAUT model, and construct of the UTAUT model is suitable for testing the user acceptance of HIT in BSMMU.

Correlation analysis

Besides the reliability analysis of the construct on the UTAUT model, this study also intended to discover whether there was a linear association between different indicators inside the model base on the 400 samples. Therefore, correlation coefficient calculated, and Spearman correlation analysis had been applied to test the extent to which different dimensions inside the model associate with each other.

Table 4.8 Spearman's correlation analysis of the UTAUT model (n=400)

	Performance Expectancy	Effort Expectancy	Social Influence	Facilitating Conditions	Behavior Intentions	User Behavior
Performance Expectancy	CC=1					
Effort Expectancy	CC=0.657 p-value <0.001	CC=1				
Social Influence	CC=0.598 p-value <0.001	CC=0.650 p-value <0.001	CC=1			
Facilitating Conditions	CC=0.480 p-value <0.001	CC=0.614 p-value <0.001	CC=0.624 p-value <0.001	CC=1		
Behavior Intentions	CC=0.505 p-value <0.001	CC=0.567 p-value <0.001	CC=0.492 p-value <0.001	CC=0.506 p-value <0.001	CC=1	
User Behavior	CC=0.316 p-value <0.001	CC=0.469 p-value <0.001	CC=0.334 p-value <0.001	CC=0.439 p-value <0.001	CC=0.260 p-value <0.001	CC=1

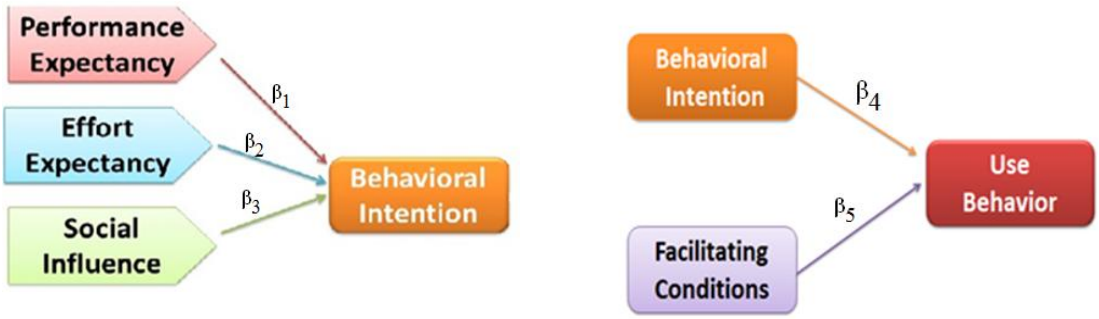
In the UTAUT model: performance expectancy, effort expectancy, social influence, facilitating conditions, behavior intentions and user behavior were all positively correlated to each other in the BSMMU that had been investigated, as their p value was smaller than 0.01 and they had positive correlation coefficient.

Among those four dimensions mentioned above, the correlation coefficient between performance expectancy (PE) and effort expectancy (EE) was the highest, which means the relationship between those two variables was strong. Effort expectancy (EE) was strongly correlated with behavior intentions (BI) as well as use behavior (UB).On the other hand, behavior intention (BI) and user behavior (Usage) were least correlated when comparing their correlation coefficient with others, which explains the weak relationship between those two variables.

So the correlation analysis had reach the conclusion that part of the UTAUT model were correlated with each other based on the data analysis from BSMMU

Regression analysis

In order to test relationship between the four dimensions in UTAUT model (PE, EE, FC and SI) and behavioral intension and use behavior, bivariate linear regression analysis was performed. Firstly we identified the effects of independent variables (PE, EE and SI) on behavioral intention (BI) based on linear regression models and after that we identified the effects of behavioral intention (BI) and facilitating condition (FC) on users behavior based on linear regression models (Figure 4.1).



$$BI = \beta_1 PE + \beta_2 EE + \beta_3 SI \qquad UB = \beta_4 BI + \beta_5 FC$$

Figure 4.1 Regression analysis model

In our first model, the independent variables were performance expectancy, effort expectancy and social influence which correspond to the dependent variable (behavioral intention). The variance (R2) of behavioral intention was 36 % which means that 36% of behavior intention can be explained by the three independent variable (PE, EE, and SI). There might be others factors that could account for behavior intention

Relationship between Performance expectancy and behavioral intention

Based on the survey, the independent variable was performance expectancy which corresponded to the dependent variable (Behavior Intention). The β coefficient for performance expectancy showed 0.200 with p-value of 0.001, point out that

performance expectancy was positively correlated with user's behavioral intention to adopt HIT. [Table 4.8]

Relationship between Effort expectancy and behavioral intention

Based on the survey, the independent variable was effort expectancy which corresponds to the dependent variable (Behavior Intension). The B coefficient for effort expectancy was 0.333 with p-value <0.001. The effort expectancy was positively related to behavioral intention, so effort expectancy significantly predicted behavior intension. [Table 4.8]

Relationship between Social influence and behavioral intention

Based on the survey, the independent variable was social influence which corresponding to the dependent variable (Behavior Intension). The B coefficient for social influence was 0.164 with p-value 0.004. The social influence is positively related to behavioral intention, and social influence could significantly predict behavior intension. [Table 4.8]

Table 4.9 Effects of independent variables on behavioral intention (BI) based on linear regression models

Independent variables the model (dependent variable Behavior Intentions)	**R^2=0.365**	**Coefficient (B)**	**Standardized Coefficients (Beta)**	**p-value**
Performance Expectancy (PE)		0.200	0.184	0.001
Effort Expectancy (EE)		0.333	0.342	<0.001
Social Influence (SI)		0.164	0.160	0.004

Effect of Facilitating conditions and Behavioral intension on user behavioral

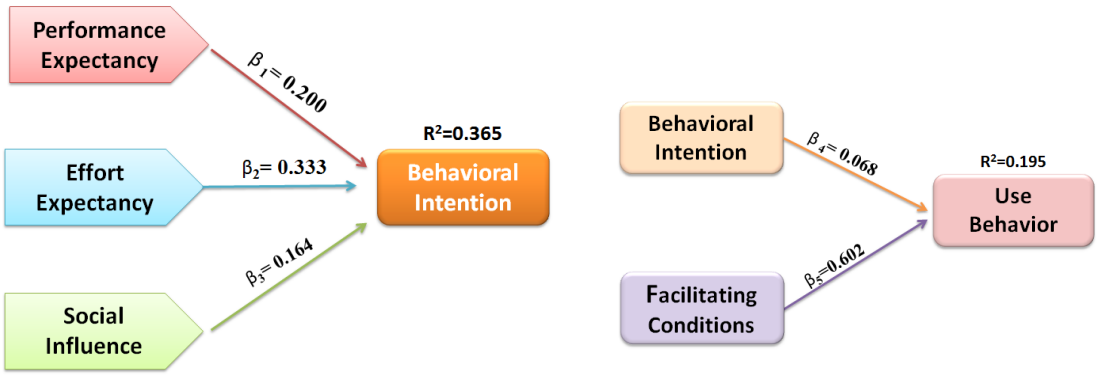
In another model, the independent variables were facilitating conditions and behavior intention which correspond to the dependent variable (User Behavioral). The variance (R2) of use behavior was 20 % which means that 20% of user behavior can be explained by the two independent variable (FC, BI). The β coefficient for facilitating

conditions is 0.602. The facilitating condition is positive to user behavioral. The value of standardized beta coefficient was 0. 414. The Sig. value is <0.001, so facilitating conditions could significantly predict user behavioral. However, behavioral intention was found to be not significantly influence to user behavior (p-value 0.33) [Table 4.9].

Table 4.10 Effects of independent variables on User Behavior (UB) based on linear regression models

Independent variables the model (dependent variable User Behavior)	**R^2=0.195**	**Coefficient (B)**	**Standardized Coefficients (Beta)**	**p-value**
Facilitating Conditions (FC)		0.602	0.414	<0.001
Behavior Intentions (BI)		0.068	0.051	0.330

Regression analysis Model:



$$BI = \beta_1 PE + \beta_2 EE + \beta_3 SI \qquad UB = \beta_4 BI + \beta_5 FC$$

Figure 4.2 Regression analysis of UTAUT model

CHAPTER V
DISCUSSION

This study's result exhibited that the majorities of the respondents are young with a bachelor degree and have been exposed to computer technology for years. Computer system with internet is widely available in BSMMU but not used extensively. The availability of computer system enhanced by the Governmental strong motivation to implement HIS through utilization of ICT and e-health systems in the country with the motto "Digital Bangladesh" (24, 25). The usage of IT behavior is on average level. Score of IT usage (reporting & care giving, administrative use and communication use) only 2.6 on 5-point scale supports this argument, mainly computer system usage for communication purpose (mean 3.0). Computer is mainly used in BSMMU for communication and administrative purpose. An integrated health information technology (HIT) is not starting yet in BSMMU. For this reason, HIT is used in minimum level in care delivery field. Along with maximum of the respondent has access to use internet. Mainly they got access by using mobile phone/tablet. Mobile phone subscribers' rate is increasing rapidly in recent years. According to Bangladesh Telecommunication Regulatory Commission (BTRC), currently the total number of Internet Subscribers has reached 36.5 million out of 160 million people at the end of September 2013 in Bangladesh. About 95 percent of them use the Internet through mobile phones, while the rest use broadband Internet from Internet Service Providers (ISP) (112). But almost half of the nurses have no experience to use computer system as well as internet surfing.

Basic knowledge on HIT

The study result showed that BSMMU staffs had average knowledge on IT. Only 65% answered at least half of the total questions correctly. The questionnaire that we used may not be adequately assessed IT literacy and the ability of a person, because to do the assessment of an individual's computer literacy and skills may

require a hand on test and a more wide-ranging instruments than the test we used (113, 114).

However, our results can provide a rough picture of the IT knowledge level of the responding BSMMU personnel. The results recommended that the BSMMU staff had basic IT knowledge similar to the health care personals and medical students in a university teaching hospital in Nigeria (115) and health center personals of Thailand (116). The result advocates that IT training will be required to improve IT knowledge, if the health information technology is to be used successfully.

Behavioral intention towards HIT

Regarding behavioral intention to use HIT, the staffs of BSMMU exhibits strong intention to use and accept IT in healthcare with average level of IT knowledge and moderate usage behavior. The circumstance that the larger part of the participants were young with masters degrees, and have been exposed to computer technology for years might be a significant contributing factor to the high IT acceptance, similar as Thailand's national survey findings(116).

Influential factors for the intention and usage of HIT

This study sought to find out the factors that influence the survey respondents' intention to use and their use behavior of health IT in BSMMU by applying UTAUT model.

According to UTAUT model, intention to use health IT is a function of the perception that it is easy to use (effort expectancy), health IT is useful (performance expectancy) and others believed that s/he should use (social influence). Our study results exhibited that the three construct of UTAUT model has influenced the usage of health IT, which is consistent with previous studies conducted in other countries (5, 98-102). Among these three influencing factors, effort expectancy is the strongest positive influential factor on behavioral intention in our study following by performance expectancy and social influence.

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In our study, the result exhibited that effort expectancy is the most positive influential factor to accept health information technology in BSMMU. This result was consistent with the results of some others previous studies, showed that effort expectancy had positive influence on user intention to accept new technology (5, 98-101, 115, 116). This result indicates that HIT developers should keep developing user oriented easy-to-use and user friendly interfaces; in general the system should be easy-to-use. A probable reason of these findings is that HIT is still in its infancy in Bangladesh and the users want to accept and use the new technology (HIT) without any effort. Users of Information Systems are concerned with the easiness that is related with the use of the information system. A complex system that is difficult to use can make users uninterested in accepting the HIT (117). But in some studies effort expectancy did not show substantial influence for behavioral intention (118-120)

Performance expectancy and social influence also exhibited a significant encouraging influence on Behavioral Intention to use HIT. This result supports some previous studies (98-101) and indicates that BSMMU staffs intentions to use HIT services are positive and they expected that HIT will be useful for them to perform their job easily and will get maximum benefit from it. During July–October 2005 a cross-sectional national survey was conducted in Thailand to understand factors that influence health IT adoption in community health centers in Thailand and the result suggested that IT acceptance is influenced by performance expectancy, effort

expectancy and social influence same as our study findings (5). Another study was done by the engineering faculty of Mahidol University in Thailand to examine the factors influencing healthcare Information Technology (IT) services. The study suggested that performance expectancy, effort expectancy and facilitating conditions were the significant influencing factors Performance expectancy was found to have the strongest direct effect on behavioral intention, whereas social influence was found to have no direct effect on behavioral intention(121). Moreover, another study conducted in Jordan found that Social Influence was the most significant determinant that directly affects behavioral intention to use M-commerce services in Jordan followed by Effort Expectancy then Performance Expectancy(116).

Facilitating conditions has significant effect on use behavior. The positive effect of facilitating conditions on use behavior is similar to studies in HIT adoption in other countries. However, this study failed to show any significant correlation or influence of behavior intention on usage behavior of HIT, due to moderate level of use behavior of HIT. as others previous study done in Indonesia to assess user acceptance toward blog technology using the UTAUT Model (118). This study may not be able to establish the full effect of the intention to use, on usage behavior, because it was a snap-shot observation which captured a current intention and use behavior simultaneously.

In summary, effort expectancy, performance expectancy and social influence are the strong factors that Influence intention to use. Additionally facilitating condition has significant effect on use behavior.

CHAPTER VI
CONCLUSION

To the best of our knowledge, this study was the first study regarding adoption of health information technology in BSMMU, as well as in Bangladesh. Based on the data collected and the results of the analysis, it can be concluded that staffs of BSMMU had high intention to use HIT, though their usage behavior and basic knowledge on HIT was on average. Beside this, there is an enough gap regarding experience, uses and knowledge on HIT between nurses and other groups. Before implementation of HIT in BSMMU, all staffs should undertake mandatory training and retraining on HIT program. Moreover, there is a need to ensure full organizational facilities. Furthermore the BSMMU authority should develop ICT policies and guidelines that would support the university staffs to perform their job. The study results suggest that user acceptance and use of HIT can be predicted from the Users Behavioral intentions, which are affected significantly by Performance expectancy, effort expectancy, and Social influence, and among these variables, effort expectancy was the most significant factor. Likewise facilitating condition has positive influence to use behavior. This result indicates that the authority needs to develop user friendly and easy-to-use HIT system and ensuring the facilitating support to the users to make success regarding adoption.

Limitations of this study:

This study has some limitations due to the time constrain. Though the sample size in this study represented about 10% of people working in the BSSMU, this may lead to selection bias in this study. Because the respondents were purposively selected according to their convenience, stratified by their health professionals and departments. As well as, only young physicians were willing to participates, this might affect the result that young people may have higher intention to use HIT.

In addition, the study was conducted in only one hospital in Bangladesh, which is the largest hospital; the results may not be able to generalize to all other hospitals in the country. Furthermore, moderators of UTAUT model such as gender, age, experience, voluntariness of use, experience, anxiety were not included. In future study, these variables should be included, as well as qualitative methods should be added to get flawless picture regarding adoption of HIT.

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APPENDICES

APPENDIX A

CERTIFICATE OF ETHICAL APPROVAL (THAILAND)

MUTM 2013-050-01

CERTIFICATE OF ETHICAL APPROVAL
Ethics Committee of the Faculty of Tropical Medicine, Mahidol University
420/6 Ratchawithi Rd., Ratchatheewee, Bangkok 10400, Thailand

This Certificate of Ethical Approval (MUTM 2013-050-01) applies to the

Project entitled: Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh

EC Submission No.: TMEC 13-054

with the following relevant documents:

1. Research Proposal (FTM ECF-019-02); English version 1 date 11 September 2013
2. Participant Information Sheet (MU-IRB-2 Form); English version date 31 July 2008
3. Form of Informed and Voluntary Consent to Participate in Research (MU-IRB-3 Form); English version date 31 July 2008
4. Questionnaire; English version (date not affixed)

Principal Investigator: Dr. Md. Maruf Haque Khan

Advisor: Dr. Saranath Lawpoolsri Niyom

Affiliation: Department of Tropical Hygiene,
Faculty of Tropical Medicine, Mahidol University

This project has been approved for the period
From 24 September 2013 to 23 September 2014

The Ethics Committee of Faculty of Tropical Medicine certify that we are in compliance with Declaration of Helsinki, ICH Guidelines for Good Clinical Practice and other International Guidelines for Human Research Protection.

Signature .....
(Prof. Dr. Srisin Khusmith)
Chairperson (Panel 2)
Ethics Committee of the
Faculty of Tropical Medicine
Date 25 SEP 2013

Signature .....
(Mrs. Pornpimon Adams)
Member and Secretary
Ethics Committee of the
Faculty of Tropical Medicine
Date 25 SEP 2013

Page 1 of 1

FTM ECF-013-03

APPENDIX B

INSTITUTIONAL REVIEW BOARD CLEARANCE (BANGLADESH)

বঙ্গবন্ধু শেখ মুজিব মেডিক্যাল বিশ্ববিদ্যালয়
Bangabandhu Sheikh Mujib Medical University
রেজিস্ট্রার অফিস
Office of the Registrar

No.BSMMU/2013/ ১১৬০৭ *Date: 26 -09-2013*

Dr. Md. Maruf Haque Khan
Student of M.Sc. Program
Biomedical and Health Informatics
Faculty of Tropiocal Medicine
Mohidol University, Thailand &
Lecturer, Dept. of Public Health & Informatics
Bangabandhu Sheikh Mujib Medical University
Shahbag, Dhaka-1000, Bangladesh.

Sub: **Institutional Review Board (I.R.B) Clearance.**

With reference to your application on the above mentioned subject, this is to inform you that your Research Proposal entitled**"(Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh)"** has been reviewed and approved by the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University in its 45th meeting held on 25 September 2013.

You are requested to follow the Institutional Review Board (I.R.B) guidelines.

26/09/13
Member Secretary
Institutional Review Board
BSMMU, Shahbag, Dhaka.

শাহবাগ, ঢাকা-১০০০, বাংলাদেশ, টেলিফোন ঃ ৮৬১২৫৫০-৪, ৮৬১৪০০১-৫, ৮৬১৪৫৪৫-৯, ফ্যাক্স ঃ ৮৮০-২-৮৬২৪৮১৭, E-mail : bsmmu@bangla.net
Shahbag, Dhaka-1000, Bangladesh, Tel : 8612550-4,8614001-5, 8614545-9, Fax : 880-2-8624817, E-mail : bsmmu@bangla.net

APPENDIX C
PERMISSION LETTER FOR DATA COLLECTION (BANGLADESH)

বঙ্গবন্ধু শেখ মুজিব মেডিক্যাল বিশ্ববিদ্যালয়
Bangabandhu Sheikh Mujib Medical University
রেজিস্ট্রার অফিস Office of the Registrar

DATE: 5 September 2013

TO:

Dr. Md. Maruf Haque Khan
MSc Student of Biomedical and Health Informatics
Faculty of Tropical Medicine, Mahidol University
Bangkok, Thailand
Mob: 0066875503057
and Lecturer Dept. of Public Health & Informatics, BSMMU, Dhaka.

FROM:

Dr. Md. Jamal Uddin Khalifa
Additional Director
Director (Incharge)
BSMMU Hospital
Bangabandhu Sheikh Mujib Medical University (BSMMU)

Subject: PERMISSION FOR COLLECTING DATA/SAMPLE

Dear Khan:

It is a matter of pleasure that you are now going to defense your thesis protocol entitled "Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh" in the Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand. I am very pleased to hear that you will collect data from our hospital for your thesis work. If your protocol is ethically sound you may collect data for BSMMU hospital.

If you have any query don't hesitate to contact with me.

Signature 5.9.2013

শাহবাগ, ঢাকা-১০০০, বাংলাদেশ, টেলিফোন ঃ ৮৬১২৫৫০-৪, ৮৬১৪০০১-৫, ৮৬১৪৫৪৫-৯, ফ্যাক্স ঃ ৮৮০-২-৮৬২৪৮১৭, E-mail : bsmmu@bangla.net
Shahbag, Dhaka-1000, Bangladesh, Tel : 8612550-4,8614001-5, 8614545-9, Fax : 880-2-8624817, E-mail : bsmmu@bangla.net

APPENDIX D

INFORMED AND VOLUNTARY CONSENT FORM

MU-IRB -3 Form

Form of Informed and Voluntary Consent to Participate in Research

Date..... /...../.....

My name is....., aged.....years old, now working at the department of .....

Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.

I hereby express my consent to participate as a subject in the study entitled "Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh"

In so doing, I am informed of the research project's origin and purposes; its procedural details to carry out or to be carried out; its expected benefits and risks that may occur to the subjects, including methods to prevent and handle harmful consequences; and remuneration, and expense. I thoroughly read the detailed statements in the information sheet given to the research subjects. I was also given explanations and my questions were answered by the head of the research project.

I therefore consent to participate as a subject in this research project. On the condition that I have any questions about the research procedures, or on the condition that I suffer from an undesirable side effect from this research, I can contact with the principle investigator at any time by mobile phone or email as follows:

Dr. Md. Maruf Haque Khan
Biomedical and Health Informatics Program
Faculty of Tropical Medicine, Mahidol University
420/6 Ratchawithi Road, Ratchathewi, Bangkok 10400. Thailand
E-mail: drmaruf38@yahoo.com, Mobile Phone: 0875503057
&
Lecturer, Department of Public Health and Informatics
Bangabandhu Sheikh Mujib Medical University, Bangladesh
Mobile Phone: +8801915055225

On the condition that I am not treated as indicated in the information sheet distributed to the subjects, I can contact the office of Ethics Committee of the Faculty of Tropical Medicine, Mahidol University, 4th Floor, The 60th Anniversary of His Majesty the King's Accession to the Throne Building Faculty of Tropical Medicine, Mahidol University. 420/6 Ratchawithi Road, Bangkok 10400, Thailand, Phone: 66 (0) 2354 9100-19 ext. 1349, 1525 or 66 (0) 2306 9126 OR

The office of the Institutional Review Board, Register Office, Bangabandhu Sheikh Mujib Medical University, Shahbagh, Dhaka-1000, Bangladesh, Phone: +88 (02) 8612550-4

Informed Consent form version 31 July 2008

ETHICS COMMITTEE
FACULTY OF TROPICAL MEDICINE
MAHIDOL UNIVERSITY
VALID from 24 SEP 2013
23 SEP 2014

1

I am aware of my right to further information concerning benefits and risks from the participation in the research project and my right to withdraw or refrain from the participation anytime without any consequence on the service and relationship with the University in the future. I consent to the researchers' use of my private information obtained in this research, but do not consent to an individual disclosure of private information. The information must be presented as part of the research results as a whole.

I thoroughly understand the statements in the information sheet for the research subjects and in this consent form. I thereby give my signature.

Signature..... Participants / Date.....

(.....)

Signature..... Person in Charge of Informing and Requesting a Consent/ Head of

(.....) Research Project/ Date.....

ETHICS COMMITTEE
FACULTY OF TROPICAL MEDICINE
MAHIDOL UNIVERSITY
VALID from 24 SEP 2013
to 23 SEP 2014

APPENDIX E

PARTICIPANT INFORMATION SHEET (ENGLISH)

MU-IRB -2 Form

Participant Information Sheet

In this document, there may be some statements that you do not understand. Please ask the principal investigator or interviewer to give you explanations until they are well understood. To help your decision making in participating the research, you may bring this document home to read and consult your relatives, intimates, personal doctor or other doctor.

Title of Research Project: Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh

Name of Researcher: Dr. Md. Maruf Haque Khan

Research Site - Department of Public Health and Informatics,
Bangabandhu Sheikh Mujib Medical University, Bangladesh
E-mail: drmaruf38@yahoo.com, Mobile Phone: +8801915055225

Source of Fund: The Rockefeller Foundation and Faculty of Tropical Medicine, Mahidol University, Thailand

This research project aims to measure current status of IT usage, basic knowledge and attitude to HIT and to describe health IT resources in the Bangabandhu Sheikh Mujib Medical University (BSMMU), which expects that the outcome of this study will be helpful for the concern authority for proper planning, designing and policy making regarding of health information technology in BSMMU

You are invited to participate in this study, because you have been selected randomly by lottery as a permanent staff of the Bangabandhu Sheikh Mujib Medical University (BSMMU).

There will be 400 participants, and the study will last for at end of December 2013.

If you decide to participate in the research project, you will go through the following procedures.

- A consent form will be provided to sign to assure your voluntary participation in the study.
- A structured questionnaire will be provided to fill-up.
- It will take about 20 minute to complete
- You can skip any question to answer or withdraw yourself form this study at any time, even after signing the consent form.
- You can ask any question at any time to the interviewer/Principle investigator.
- After completing it, Please return the questionnaire to the interviewer/Principle investigator.

If you do not participate in this study, it will not affect your current or future relations with the University.

There is no risk associated with participating in this study. However, if you feel uneasy with any of the questions, you can refuse to answer. You may also skip questions you do not want to answer. You can stop the interview at any time. The researcher conducting this study is Dr. Md. Maruf Haque Khan. You may ask any questions you have now. If you have questions later, you may contact the investigator at the following address:

ETHICS COMMITTEE
FACULTY OF TROPICAL MEDICINE
MAHIDOL UNIVERSITY
VALID from 24 SEP 2013
to 23 SEP 2014

Dr. Md. Maruf Haque Khan
Biomedical and Health Informatics Program
Faculty of Tropical Medicine, Mahidol University
420/6 Ratchawithi Road, Ratchathewi, Bangkok 10400. Thailand
E-mail: drmaruf38@yahoo.com, Mobile Phone: 0875503057
&
Lecturer, Department of Public Health and Informatics
Bangabandhu Sheikh Mujib Medical University, Bangladesh
Mobile Phone: +8801915055225

Remuneration: There is no payment or direct benefit for participating in the study. However participant will get a souvenir for participating in this study

Expense: The participant is not to be responsible for any expense

If relevant information arises about benefits and risks of the research project, the researcher will inform the participant.

In the survey, you will not be asked to fill in your name or any identifiable information. The records of this study will be securely kept . In any sort of report we might publish, we will not include any information that will make it possible to identify a subject. Research records will be kept in a locked file; only researchers, funding organization, and the ethics committee will have access to the records.

The participant has the right to withdraw from the study at any time without prior notice. And the refusal to participate or the withdrawal from the study will not at all affect the current or future relations with the University.

On the condition that you are not treated as indicated in this information sheet, you can contact:

The office of Ethics Committee of the Faculty of Tropical Medicine, Mahidol University
4th Floor, The 60th Anniversary of His Majesty the King's Accession to the Throne Building
Faculty of Tropical Medicine, Mahidol University
420/6 Ratchawithi Road, Bangkok 10400, Thailand
Phone: 66 (0) 2354 9100-19 ext. 1349, 1525 or 66 (0) 2306 9126

OR

The office of the Institutional Review Board
Register Office
Bangabandhu Sheikh Mujib Medical University
Shahbagh, Dhaka-1000, Bangladesh
Phone: +88 (02) 8612550-4

ETHICS COMMITTEE
FACULTY OF TROPICAL MEDICINE
MAHIDOL UNIVERSITY
VALID from 24 SEP 2013
to 23 SEP 2014

APPENDIX F

Questionnaire (English)

Questionnaire

Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh

Instructions:

This questionnaire has four sections with five pages. It will take about 20 minute to complete. Please try to answer every question. You can withdraw yourself anytime, if you don't want to continue.

Section A: Demography

1. Gender:

Male	1
Female	2

2. Age (in complete year):

3. Name of your working department::

4. Highest Education level:

Diploma/Certificate	1
Bachelor degree	2
Master degree	3
Doctorate degree	4
Others(Specify):	5

5. Major Field of Work:

Physician/Teacher	1
Nurse	2
Administrator	3
Technician	4
Others(Specify):	5

6. Computer system currently used in your office/department

☐ No ☐ Yes

7. Any internet connection(s) available in your office/department

☐ No ☐ Yes ☐ I don't know

8. How do you get access to the internet? (You can answer all that apply)

Never access the internet	1
At my workplace/department	2
At home	3
Others(please specify)	4

Section B: Computer Usage:

9. How long ago did you first start to use a computer?

Never use	1
Less than 1 month	2
1-6 months	3
7-11 months	4
12month-2 years	5
3-5 years	6
6-10 years	7
More than 10 years	8

10. How often do you use computer system hand on?

Don't use at all	1
Use less than once each week	2
Use about once each week	3
Use Several times each week	4
Use about once a day	5
Use several times each day	6

11. What kind(s) of computer do you routinely use?

Desktop computer at your office	1
Desktop computer at your home	2
Offices portable notebook/laptop	3
Your portable notebook/laptop	4
Tablet/iPAD/Mobile phone	5
Others(Specify)	6

12. What Training or experience with computer have you had? (Answer all that apply)

- ☐ Formal school (college, university) computer and related field course training.
- ☐ Formal workshops, conferences or short courses (1-3 weeks) on computer
- ☐ Self-guided learning about computers
- ☐ Other way of learning(Please specify)_____
- ☐ None

13. To what extent do you personally use a computer for each of the following professional tasks?

	Statement (please circle one response for each)	**Never** Perform this task	**Perform** this task but **never** use a	**Sometimes** Use a computer	**Often** use a computer	**Always** use a computer
a	Recording patient information (e.g. history, physical exam, laboratory, procedure provided etc.)	1	2	3	4	5
b	Retrieving previously recorded individual information for providing care (treatment, family planning, ANC, Immunization, counseling etc)	1	2	3	4	5
c	Writing official letters, reports etc.	1	2	3	4	5
d	Preparing presentation slides	1	2	3	4	5
e	Communicating with colleagues (email, etc)	1	2	3	4	5
f	Searching for information associating with office tasks (e.g. health literature, official documents, etc.)	1	2	3	4	5
g	Searching for information associating with personal interest such as knowledge associated with personal continuous education, general knowledge (travel information, news etc.)	1	2	3	4	5
h	Performing statistical analysis	1	2	3	4	5
i	Generating mandatory reports	1	2	3	4	5

Section C: Information and Communication Technology Knowledge

	Statement (please circle one response for each)	True	False	Not Know
1	Linux is an example of an operating system	1	2	3
2	Example of graphic and design software are Corel Draw, Adobe Illustrator and adobe Photoshop	1	2	3
3	Software is a series of instruction that make computer to do something	1	2	3
4	Computer virus is a software that can damage computer	1	2	3
5	USB stands for universal Serial Bus	1	2	3
6	All the information used by the processor loaded first into RAM	1	2	3
7	The most common use for serial or com ports is to increase processing speed.	1	2	3

Social influence (SI):						
9	People who influence my behavior think I should use the computer system	1	2	3	4	5
10	People who are important to me think I should use the computer system	1	2	3	4	5
11	The senior management of this institution has been helpful in the use of the computer system	1	2	3	4	5
12	In general, the organization has supported the use of the computer system	1	2	3	4	5
Facilitating condition (FC):						
13	I have the resources necessary to use the computer system	1	2	3	4	5
14	I have the knowledge necessary to use the computer system	1	2	3	4	5
15	The system is compatible with other computer system I use.	1	2	3	4	5
16	A specific person is available in this university for assistance with computer system difficulties	1	2	3	4	5
17	I think that using the computer system would be fits well with the way I like to work.	1	2	3	4	5
18	I have knowledge source (e.g. books, documents, consultants) to help me, learn about the computer system.	1	2	3	4	5
Behavioral intention (BI):						
19	I intend to use the computer system in the next 3 months.	1	2	3	4	5
20	I predict I would use the computer system in the next 3 months	1	2	3	4	5
21	I plan to use the computer system in the next 3 months	1	2	3	4	5

Thank you very much for your participation

If you have any question regarding this questionnaire
Please contact

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APPENDIX G
PARTICIPANT INFORMATION SHEET (BANGLA)

INFORM CONSENT FORM FOR SUBJECTS (In Bangla Language)

অবহিতক্রমে সম্মতিপত্র

গবেষণার শিরোনাম : Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh

প্রধান গবেষক : ডাঃ মো. মারুফ হক খান

এই সম্মতিপত্রের উদ্দেশ্য হলো আপনাকে প্রয়োজনীয় তথ্য প্রদান করা, যে তথ্যগুলো আপনাকে সিদ্ধান্ত নিতে সাহায্য করবে, আপনি এই গবেষণায় অংশগ্রহণ করবেন কি না?

উদ্দেশ্য পদ্ধতি : বঙ্গবন্ধু শেখ মুজিব মেডিকেল বিশ্ববিদ্যালয় এর ফ্যাকাল্টি মেম্বার, চিকিৎসক, নার্স, ও অন্যান্য কর্মকর্তা ও কর্মচারীদের কম্পিউটার এর ব্যবহার ও কম্পিউটারে দ্বারা কাজের পরিধি জানার জন্য এই গবেষণাটি পরিচালনা করা হবে। এই গবেষণাটি Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand এবং পাবলিক হেলথ ও ইনফরমেটিক্স বিভাগ, বঙ্গবন্ধু শেখ মুজিব মেডিকেল বিশ্ববিদ্যালয় কর্তৃক পরিচালিত হবে। আপনি যদি এই গবেষণায় অংশগ্রহণ করতে সম্মত থাকেন তাহলে গবেষণার নিয়োজিত চিকিৎসক সে সম্পর্কিত কিছু প্রশ্ন আপনাকে করবেন।

গবেষণার ঝুঁকি : এই গবেষণায় অংশগ্রহণে আপনার শারীরিক কোন অস্বস্তির সম্মুখীন হতে হবে না।

গবেষণায় অংশগ্রহণের সুবিধাদি : এই গবেষণা বাংলাদেশে চিকিৎসক এবং হাসপাতালে কর্মরত কর্মকর্তা ও কর্মচারীদের কম্পিউটার এর ব্যবহার সম্পর্কে সম্যক ধারণা পেতে সহায়তা করবে।

বিকল্প : এই গবেষণায় অংশগ্রহণ করা কিংবা না করার ব্যাপারে বা অংশগ্রহণ করার পর যে কোন সময় আপনি নিজেকে গবেষণা থেকে সরিয়ে নিতে পারেন।

খরচ : এই গবেষণায় অংশগ্রহণের জন্য আপনার কোন খরচ নাই বা আপনাকে কোন টাকা পয়সা দেয়া হবে না।

গোপনীয়তা : গবেষণা চলাকালীন ও পরবর্তীতে সকল তথ্য কঠোরভাবে গোপন রাখা হবে। পরবর্তীতে ফলোআপ ও অনুসরণ প্রক্রিয়ার জন্য আপনাকে একটি আইডি নম্বর দেওয়া হবে। আপনার আইডি নম্বর সম্বলিত সব ধরনের কাগজপত্রে আপনার/রোগীর নাম ও ঠিকানা মুছিয়ে অফিসের ফাইলিং কেবিনেটে তালাবদ্ধ থাকবে ব্যক্তিগত বিষয়াদি তথ্য বিশ্লেষণে,

প্রতিবেদন তৈরিতে এবং প্রকাশনার কাজে ব্যবহার হবে না এবং গবেষণার পরীক্ষক ব্যতীত কারো কাছে প্রকাশ করা হবে না। ফলে আপনার কোন তথ্য অন্য কেউ জানতে পারবে না।

স্বেচ্ছামূলক অংশগ্রহণ : এই গবেষণায় আপনার অংশগ্রহণ সম্পূর্ণ স্বেচ্ছামূলক। আপনি গবেষণায় অংশগ্রহণে অস্বীকৃতি জানাতে পারেন অথবা গবেষণা চলাকালীন যে কোন সময় গবেষণা থেকে আপনাকে প্রত্যাহার করে নিতে পারেন। তাতে আপনার চিকিৎসার কোন তারতম্য হবে না। এই ফরমে স্বাক্ষর করলে আপনার আইনগত কোন অধিকার খর্ব হবে না ।

প্রশ্নাবলী : যদি আপনার কোন প্রশ্ন থাকে তবে দয়া করে জিজ্ঞাসা করুন। আমরা তার উত্তর প্রদান করার যথাসাধ্য চেষ্টা করবো।

সম্মতির স্বীকারোক্তি : আমি গবেষণায় নিয়োজিত গবেষকের-এর সাথে এই গবেষণা নিয়ে আলোচনায় সন্তুষ্টি প্রকাশ করছি। আমি এটা বুঝেছি যে গবেষণায় অংশগ্রহণ স্বেচ্ছামূলক এবং আমি যে কোন সময় কোন বাধ্যবাধকতা ছাড়াই গবেষণা থেকে আমাকে বিরত রাখতে পারি। আমি উপরোক্ত শর্তগুলো পড়েছি/ আমার সম্মুখে পঠিত হয়েছে এবং স্বেচ্ছায় গবেষণায় অংশগ্রহণ করতে সম্মতি জ্ঞাপন করছি।

গবেষকের স্বাক্ষর	অংশগ্রহণকারীর স্বাক্ষর/	স্বাক্ষীর স্বাক্ষর
তারিখঃ	বৃদ্ধাঙ্গুলির ছাপ	তারিখঃ
	তারিখঃ	

APPENDIX H

QUESTIONNAIRE (BANGLA)

Questionnaire / প্রশ্নমালাঃ

Adoption of Health Information Technology (HIT) in Bangabandhu Sheikh Mujib Medical University: Lone Medical University in Bangladesh

Instructions / নির্দেশাবলীঃ

এখানে ৩ পৃষ্ঠায় ৪ টি অধ্যায় আছে। সবগুলো প্রশ্নের উত্তর দিতে ২০ মিনিট সময় লাগবে। চেষ্টা করুন সবগুলি প্রশ্নের উত্তর দিতে। আপনি যেকোনো সময় উত্তর দেয়া থেকে বিরত থাকতে পারেন।

Section A: Demography		
১. লিঙ্গ ঃ	পুরুষ	১
	মহিলা	২
২. বয়স (বছর) ঃ		
৩. কর্মস্থল বিভাগের নামঃ		
৪. সর্বোচ্চ শিক্ষাগত যোগ্যতা ঃ	ডিপ্লোমা/সার্টিফিকেট	১
	স্নাতকতর ডিগ্রী	২
	মাষ্টার্স ডিগ্রী	৩
	ডাক্তরেট ডিগ্রী	৪
	অন্যান্য	৫
৫. কর্মক্ষেত্র ঃ	টিচিংহসপিটাল/ শিক্ষক	১
	স্টাফ	২
	এডমিনিস্ট্রেটর	৩
	টেকনিশিয়ান	৪
	অন্যান্য	৫
৬. আপনার অফিস বা বিভাগে কম্পিউটারের ব্যবহার হয় কি না।	না	১
	হ্যাঁ	২
৭. আপনার অফিস বা বিভাগে ইন্টারনেট কানেকশন আছে কি না?	হ্যাঁ	১
	হ্যাঁ	২
	জানা নেই	৩
৮. আপনি মোবাইল ইন্টারনেট ব্যবহার করেন ঃ (প্রযোজ্য ক্ষেত্রে একের অধিক উত্তর প্রযোজ্য)	জানেনা না	১
	কর্মক্ষেত্রে	২
	বাড়ীতে	৩
	অন্যান্য	৪
Section B: Computer Usage:		
৯. কতদিন ধরে কম্পিউটার ব্যবহার করেন।	জানেনা না	১
	একমাসের কম	২
	১-৬ মাস	৩
	৭ - ১১ মাস	৪
	১২ মাস - ২ বৎসর	৫
	৩-৫ বৎসর	৬
	৬ - ১০ বৎসর	৭
	১০ বছরের বেশী	৮
১০. কতক্ষন কম্পিউটার ব্যবহার করেন।	জানেনা না	১
	শপ্তাহে একঘন্টার ও কম	২
	শপ্তাহে একঘন্টা	৩
	শপ্তাহে কয়েকঘন্টা	৪
	প্রতিদিন	৫
	দিনে কয়েকঘন্টা	৬
১১. কি ধরনের কম্পিউটার ব্যবহার করেন ঃ (প্রযোজ্য ক্ষেত্রে একের অধিক উত্তর প্রযোজ্য)	ব্যবহার করি না	১
	অফিসের ডেস্কটপ কম্পিউটার	২
	বাড়ীতে ডেস্কটপ কম্পিউটার	৩
	অফিসে নোটবুক কম্পিউটার (ল্যাপটপ)	৪
	বাড়ীতে নোটবুক কম্পিউটার	৫
	পিডিএ/ স্মার্টফোন/ মোবাইল ফোন	৬
১২. কম্পিউটার সিস্টেমের উপর আপনার কি ধরণের প্রশিক্ষণ/ অভিজ্ঞতা রয়েছে? (প্রযোজ্য ক্ষেত্রে একের অধিক উত্তর প্রযোজ্য)	কোন প্রশিক্ষণ/ অভিজ্ঞতা নাই	১
	স্বল্প সময়ের প্রশিক্ষণ (যেমনঃ ইন্টারনেট)	২
	ডিপ্লোমা, ডিগ্রীকোর্স বা পূর্ণ কোর্স	৩
	শিক্ষা থেকে পেশা	৪
	অন্যান্য	৫

১৩. নিম্ন লিখিত কাজের কোন ক্ষেত্রে আপনি কম্পিউটার ব্যবহার করেন?

	প্রতি কাজের জন্য প্রযোজ্য একটি বৃত্ত তৈরি করুন	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ক)	রোগীর তথ্য সংগ্রহ করা (রোগের বর্ণনা, শরীর পরীক্ষা করা, ল্যাব পরীক্ষা, শল্য চিকিৎসা)	১	২	৩	৪	৫
খ)	চিকিৎসার সুবিধার্থে রোগের পূর্ববর্তী/ অতীত তথ্য সংগ্রহ করা (ঔষধ, পরিবার পরিকল্পনা, এন্টিনাটাল কেয়ার, টিকা দান, পরামর্শ)	১	২	৩	৪	৫
গ)	দাপ্তরিক চিঠি-পত্র লেখা।	১	২	৩	৪	৫
ঘ)	পাওয়ার পয়েন্ট/প্রেজেন্টেশন স্লাইড তৈরী করা।	১	২	৩	৪	৫
ঙ)	সহকর্মীদের সাথে যোগাযোগ করা (ই-মেইল ইত্যাদি)	১	২	৩	৪	৫
চ)	কাজের প্রয়োজনে তথ্য অনুসন্ধান করা (স্বাস্থ্য বিষয়ক প্রবন্ধ, অফিসের কাগজ পত্র ইত্যাদি)	১	২	৩	৪	৫
ছ)	ব্যক্তিগত প্রয়োজনে তথ্য অনুসন্ধান যেমন:- ব্যক্তিগত প্রায়োগিক জ্ঞান অর্জন, সাধারণজ্ঞান, (ভ্রমণ সংক্রান্ত তথ্য, দৈনিক খবর ইত্যাদি)	১	২	৩	৪	৫
জ)	Statistical analysis করা।	১	২	৩	৪	৫
ঝ)	অফিসকালী রিপোর্ট তৈরী করা।	১	২	৩	৪	৫

Section C: Information and Communication Technology Knowledge

	প্রতি কাজের জন্য প্রযোজ্য একটি বৃত্ত তৈরি করুন	[illegible]	[illegible]	[illegible]
১.	লিনাক্স একটি অপারেটিং সিস্টেম এর উদাহরণ।	১	২	৩
২.	গ্রাফিক ও ডিজাইন সফটওয়ার এর উদাহরণ হচ্ছে- Corel Draw, Adobe Illustrator and Adobe Photoshop	১	২	৩
৩.	সফটওয়ার হচ্ছে কিছু ক্রমিক নির্দেশ যা কম্পিউটার কে কাজ করতে সাহায্য করে।	১	২	৩
৪.	কম্পিউটার ভাইরাস হচ্ছে একধরনের সফটওয়ার যা কম্পিউটার এর ক্ষতি সাধন করতে পারে।	১	২	৩
৫.	USB হচ্ছে- Universal Serial Bus.	১	২	৩
৬.	প্রসেসর এ ব্যবহৃত সকল তথ্য প্রথমে RAM এ উত্তোলিত হয়।	১	২	৩
৭.	Serial বা Com port এর কাজ হচ্ছে প্রসেসর এর শক্তি বৃদ্ধি করা।	১	২	৩
৮.	গিগাবাইট হচ্ছে হার্ডডিস্ক এর ধারণ ক্ষমতার একক।	১	২	৩
৯.	একটি নতুন Compact Disk (CD) এ লেখার আগে পূর্ববর্তী তথ্য মুছে দিতে হয়।	১	২	৩
১০.	মনিটর এর রেজিলিউশন আকারের এর মান সম্পর্কে ধারণা দেয়।	১	২	৩
১১.	কিবোর্ড এর মাধ্যমে সাহায্যের জন্য F_1 বাটন টিপতে হয়।	১	২	৩
১২.	স্ক্যানার একটি Output যন্ত্র।	১	২	৩
১৩.	LAN মানে Local Area Network	১	২	৩
১৪.	তথ্য ফাইবার অপটিক তারের মাধ্যমে আলোর সাহায্যে পাঠানো হয়।	১	২	৩
১৫.	কম্পিউটার নেটওয়ার্ক হচ্ছে ২ বা ততোধিক কম্পিউটার এর মধ্যে সংযোগ।	১	২	৩
১৬.	ইন্টারনেট হচ্ছে ২ বা ততোধিক (পৃথিবী জুড়ে) কম্পিউটার এর মধ্যে সংযোগ।	১	২	৩
১৭.	প্রেজেন্টেশন এর মাধ্যে চলমান চিত্র, শব্দ, ভিডিও এর সমন্বয়কে মাল্টিমিডিয়া বলে।	১	২	৩
১৮.	E. commerce হচ্ছে ইন্টারনেট এর মাধ্যমে অনলাইন বইয়ের দোকান হতে বই কেনা।	১	২	৩
১৯.	সবচেয়ে বেশী তথ্য ভুল হয় মানুষের ভুলের জন্য।	১	২	৩
২০.	তথ্য ক্ষেত্রে (ডাটা ফিল্ড) একটি রেকর্ডের অংশ।	১	২	৩

Section D: Opinion about using/intention to using HIT3

	প্রতি কাজের জন্য প্রযোজ্য একটি বৃত্ত চিহ্নিত করুন	একদমই সঠিক নয়	সঠিক নয়	নিরপেক্ষ	সঠিক	একদমই সঠিক
Performance expectancy (PE):						
ক)	কম্পিউটার আমার কাজে সহায়তা করবে	১	২	৩	৪	৫
খ)	কম্পিউটার ব্যবহার করে আমার কাজ দ্রুত সম্পন্ন করতে পারব	১	২	৩	৪	৫
গ)	কম্পিউটার সিস্টেম অনেক বেশি/অতিরিক্ত কাজ সম্পন্ন করতে সহায়তা করবে	১	২	৩	৪	৫
ঘ)	কম্পিউটার সিস্টেম ব্যাবহারের ফলে আমার promotion এর সম্ভাবনা বৃদ্ধি পেতে পারে	১	২	৩	৪	৫
Effort expectancy (EE):						
ঙ)	কম্পিউটারে আমার কাজ সঠিক ও সহজে বোঝা যায়	১	২	৩	৪	৫
চ)	আমি সহজেই কম্পিউটারে দক্ষতা অর্জন করতে পারব।	১	২	৩	৪	৫
ছ)	কম্পিউটার ব্যবহার করা সহজ	১	২	৩	৪	৫
জ)	কম্পিউটারে কাজ শেখা আমার জন্য সহজ	১	২	৩	৪	৫
Social influence (SI):						
ঝ)	আমার শুভাকাঙ্খীরা চায় আমি কম্পিউটার ব্যবহার করি	১	২	৩	৪	৫
ঞ)	গুরুত্বপূর্ণ ব্যক্তিরাও চায় আমি কম্পিউটার ব্যবহার করি	১	২	৩	৪	৫
ট)	অফিসের সিনিয়র কর্মকর্তারা কম্পিউটার ব্যবহার করতে সহযোগিতা করেন	১	২	৩	৪	৫
ঠ)	সর্বোপরি হাসপাতালের সবকিছু কম্পিউটার ব্যবহারের সহযোগিতা করছে	১	২	৩	৪	৫
Facilitating condition (FC):						
ড)	কম্পিউটার সিস্টেম ব্যবহারের জন্য প্রয়োজনীয় সুযোগ সুবিধা/ সরঞ্জামাদি অত্র অফিসে রয়েছে	১	২	৩	৪	৫
ঢ)	কম্পিউটার সিস্টেম ব্যবহারের প্রয়োজনীয় জ্ঞান আমার রয়েছে	১	২	৩	৪	৫
ণ)	আমার ব্যবহৃত কম্পিউটার সিস্টেম এর সাথে অত্র অফিসের কম্পিউটার সিস্টেমের মিল আছে	১	২	৩	৪	৫
ত)	কম্পিউটার সিস্টেমের সমস্যা সমাধানের জন্য হাসপাতালের একজন কর্মকর্তা নিয়মিত রয়েছেন	১	২	৩	৪	৫
থ)	আমি মনে করি আমার প্রাত্যহিক কাজের সাথে কম্পিউটার ব্যবহার সামঞ্জস্যপূর্ণ হবে	১	২	৩	৪	৫
দ)	কম্পিউটারের কাজ সেবার জন্য প্রয়োজনীয় উপাত্ত (বই, ডকুমেন্ট, কনসালটেন্ট) অত্র অফিসে রয়েছে	১	২	৩	৪	৫
Behavioral intention (BI):						
প)	আমি আগামী ৩ মাসে কম্পিউটার ব্যবহার করতে চাই।	১	২	৩	৪	৫
ফ)	আগামী ৩ মাসে আমাকে কম্পিউটার ব্যবহার করতে হতে পারে।	১	২	৩	৪	৫
ব)	আমি আগামী ৩ মাসে কম্পিউটার ব্যবহার করার চিন্তা করছি।	১	২	৩	৪	৫

আপনার সক্রিয় অংশগ্রহণের জন্য ধন্যবাদ

আপনার যদি উপরোক্ত প্রশ্নাবলী সম্পর্কে কোন কিছু জানতে চান, তাহলে নিম্ন ঠিকানায় যোগাযোগ করুন।
ডাঃ মোঃ মারুফ হক খাঁন
বায়োমেডিক্যাল এন্ড হেলথ্ ইনফরমেটিক্স প্রোগ্রাম
ফ্যাকাল্টি অব ট্রপিক্যাল মেডিসিন, মাহিডল ইউনিভার্সিটি
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বঙ্গবন্ধু শেখ মুজিব মেডিক্যাল বিশ্ববিদ্যালয়
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