Modeling Analysis of the Factors Affecting the Information and Communication Technology Acceptance and Use

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ABSTRACT

Over the last decade the business world has changed so rapidly, that one can no longer imagine managing in a steady state. In no other domain has this observation been more relevant than in the field of Information and Communication Technology (ICT).

The Internet and mobile technology, the two most dynamic technological forces in modern information and communication technologies are converging into one ubiquitous mobile Internet service, which will change our way of both doing business and dealing with our daily routine activities. There is no doubt that the mobile Internet service is moving toward the new generation on which enables mobile users to enjoy a variety of new and upgraded multimedia mobile services.

Agarwal (2000) defines technology adoption as the use, or acceptance of a new technology, or new product. Moreover, understanding individual acceptance and use of information technology is one of the most mature streams of information systems research. In Information Technology and Information System (IT/IS) research, numerous theories are used to understand users' adoption of new technologies. Various models were developed including the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and recently, the Unified Theory of Acceptance and Use of Technology (UTAUT). Each of these models has sought to identify the factors which influence a citizen's intention or actual use of information technology.

Drawing mainly on the UTAUT model, flow theory, and other extant well-established theoretical models, this research composes a new hybrid theoretical framework to identify the factors affecting the acceptance and use of mobile Internet -as an ICT application- in a consumer context. The proposed model incorporates eight constructs: Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), Social Influences (SI), Perceived Value (PV), Perceived Playfulness (PP), Attention

Focus (AF), and Behavioral Intention (BI). Individual differences—namely, age, gender, and experience—are hypothesized to moderate the effects of behavioral intention towards the use of ICT.

Data collected online from 624 respondents in Saudi Arabia were tested against the research model, using the structural equation modeling approach. The proposed model was mostly supported by the empirical data. It was found that performance expectancy and perceived playfulness have the strongest significant effect on the behavioral intentions towards the use of ICT. Perceived value, effort expectancy, and the moderating variables of age, gender, and experience found to be statistically non-significantly affecting the acceptance and use of ICT. The rest of the factors yield moderated effect on the intentions and use of the technology. The findings of this study provide several crucial implications for ICT and, in particular, mobile Internet service providers, practitioners, consumers and researchers.

Table of Contents

ABSTRACT ..... **I**

TABLE OF CONTENTS ..... **III**

LIST OF TABLES ..... **VI**

LIST OF FIGURES ..... **VII**

ACKNOWLEDGEMENTS ..... **VIII**

DEDICATION ..... **IX**

1 INTRODUCTION **1**

1.1 AIMS AND OBJECTIVES 2

1.2 RESEARCH QUESTIONS 3

1.3 PRACTICAL AND THEORETICAL VALUE OF THE RESEARCH 4

1.4 RESEARCH METHODOLOGY 5

1.5 LIMITATIONS OF SCOPE 7

2 LITERATURE REVIEW **8**

2.1 ICT ACCEPTANCE 9

2.2 REVIEW OF TECHNOLOGY ACCEPTANCE THEORIES 11

2.3 INNOVATION DIFFUSION THEORY (IDT) 11

2.4 THEORY OF REASONED ACTION (TRA) 12

2.5 THEORY OF PLANNED BEHAVIOR (TPB) 13

2.6 TECHNOLOGY ACCEPTANCE MODEL (TAM) 14

2.7 UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT) 16

3 CONCEPTUAL MODEL AND HYPOTHESES **23**

3.1 RESEARCH QUESTION 23

3.2 RESEARCH MODEL AND HYPOTHESES 24

3.2.1 Performance Expectancy 25

3.2.2 Effort Expectancy 26

3.2.3 Social Influence 26
3.2.4 Facilitating Conditions 27
3.2.5 Perceived Value 27
3.2.6 Perceived Playfulness 28
3.2.7 Attention Focus 28
3.2.8 Behavioral Intention 29
3.2.9 Moderating variable 29

4 SURVEY RESEARCH DESIGN AND METHOD 31

4.1 SURVEY OBJECTIVES 32
4.2 SURVEY RESEARCH DESIGN 32
4.3 UNIT OF ANALYSIS 33
4.4 RESEARCH INSTRUMENT 33
4.5 PILOT-TEST 34
4.6 QUESTIONNAIRE DESIGN 34
4.7 QUESTIONNAIRE DISTRIBUTION AND DATA COLLECTION 36
4.8 DESCRIPTIVE STATISTICS 36
4.8.1 Demographic Statistics 37

5 ANALYSIS OF THE DATA 41

5.1 FACTOR ANALYSIS 41
5.2 REGRESSION ANALYSIS 44
5.3 MODEL VALIDATION 45
5.4 SCALE RELIABILITY 46
5.5 CONVERGENT VALIDITY 46
5.6 DISCRIMINANT VALIDITY 48
5.7 PATH ANALYSIS 49
5.8 PATH COEFFICIENTS 50
5.9 PATH VALIDITY 53

5.10 PREDICTIVE ABILITY 54
5.11 GLOBAL GOODNESS OF FIT 55
5.12 MODERATING EFFECTS 55
5.13 PERCEIVED LEVEL OF MODERATING VARIABLES 56

6 SYNTHESIS OF THE RESEARCH FINDINGS 59

6.1 HYPOTHESES TESTING 59
6.2 CONCLUSION AND DISCUSSION 62

7 CONCLUSIONS AND FUTURE IMPLICATIONS 67

7.1 OVERVIEW OF RESEARCH 67
7.2 THE RESEARCH MODEL 68
7.3 RESEARCH METHODOLOGY 68
7.4 SUMMARY OF THE MAIN FINDINGS 68
7.5 LIMITATIONS 70
7.6 IMPLICATION FOR FURTHER RESEARCH 70

8 PUBLICATIONS 72

8.1 JOURNALS 72
8.1.1 Scopus indexed 72
8.1.2 ACM, DBLP and Google Scholar indexed 72
8.2 BOOK CHAPTERS 73
8.3 CONFERENCES 73

REFERENCES 75

APPENDIX A - MEASUREMENT SCALES AND ITEMS **87**

APPENDIX B - SURVEY QUESTIONNAIRE **89**

List of Tables

TABLE 2.1 - TECHNOLOGY ACCEPTANCE THEORIES: CHARACTERISTICS, AND CRITICISMS 19

TABLE 4.1 - DEMOGRAPHIC STATISTICS BY GENDER 37

TABLE 4.2 - DEMOGRAPHIC STATISTICS BY AGE 37

TABLE 4.3 - DEMOGRAPHIC STATISTICS BY EDUCATION 38

TABLE 4.4 - DEMOGRAPHIC STATISTICS BY INCOME 38

TABLE 4.5 - DEMOGRAPHIC STATISTICS BY OCCUPATION 39

TABLE 4.6 - DEMOGRAPHIC STATISTICS BY INTERNET EXPERIENCE 39

TABLE 4.7 - DEMOGRAPHIC STATISTICS BY INTERNET USAGE FREQUENCY 40

TABLE 5.1 -EIGENVALUE AND CUMULATIVE PERCENTAGE OF VARIANCE EXPLAINED 43

TABLE 5.2 - FIT INDICES FOR STRUCTURAL MODEL 45

TABLE 5.3 - LOADINGS AND CROSS-LOADINGS 47

TABLE 5.4 - RELIABILITY, CORRELATION COEFFICIENT MATRIX AND SQUARE ROOTS OF AVES 48

TABLE 6.1 - HYPOTHESES TESTING 59

List of Figures

FIGURE 1.1 - THE PROPOSED RESEARCH MODEL 7

FIGURE 2.1 - THEORY OF REASONED ACTION 13

FIGURE 2.2 - THEORY OF PLANNED BEHAVIOR 14

FIGURE 2.3 - TECHNOLOGY ACCEPTANCE MODEL 15

FIGURE 2.4 - TECHNOLOGY ACCEPTANCE MODEL 2 16

FIGURE 2.5 - UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY 17

FIGURE 3.1 - THE PROPOSED RESEARCH MODEL WITH HYPOTHESES 30

FIGURE 5.1 - SCREE PLOT 43

FIGURE 5.2 - REGRESSION ANALYSIS DIAGRAM 51

FIGURE 5.3 - PATH COEFFICIENT DIAGRAM 52

FIGURE 5.4 - PATH COEFFICIENT ANALYSIS OF THE MAIN MODEL 53

FIGURE 5.5 - BOOTSTRAPPING PATH COEFFICIENTS 54

FIGURE 5.6 - MODERATING VARIABLE PATH COEFFICIENTS 57

FIGURE 5.7 - MODERATING VARIABLE BOOTSTRAPPING ANALYSIS 58

FIGURE 6.1 - SUPPORTED HYPOTHESES LABELED BY THEIR SIGNIFICANCE VALUES 60

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Finally, many ideas in my thesis have been inspired by, and sometimes were the direct product of discussions with, many other people who are genuinely interested in my work. Although mere thanks are inadequate, I sincerely thank all of them.

DEDICATION

"This thesis is dedicated to my Parents, my wife Massar, my brother Mohamed, and my two little angels Hussein and Noor for their years of patience and *support during my PhD Journey"*

1 Introduction

Information and communications technology or ICT, is often used as an extended synonym for Information Technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications, computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information. ICT is an interdisciplinary area of research driven and shaped by the fast development of computing, communication, and Internet-related technologies, which have a great impact on our societies and daily lives. Over the last few decades there has been an increase in ICT research, which has changed and shaped the way societies and organizations operate and produce their goods and services.

Over the last decade the business world has changed so rapidly, that one can no longer imagine managing in a steady state. In no other domain has this observation been more relevant than in the field of ICT. It is not only the generation of new technology but also, and perhaps even to a higher extent, its diffusion throughout the economy which affects productivity growth at the macro-level. Pilat and Lee (2001), showed that to capture the benefits of ICT it is not necessary to dispose of an ICT producing sector. Timely diffusion of new technology or, from the firm's point of view, its adoption is a key element to securing economic growth.

ICT use has proliferated throughout most sectors of the economies of developed countries. In the recent years, the mobile industry as a whole has been growing at an increasing pace (Liu & Li, 2011). Despite the recent downturn following the global financial crisis, the mobile industry has stayed relatively unscathed. With the so-called smart phone revolution, where advanced mobile devices are starting to see mass-adoption, the demand for more sophisticated mobile services is on the rise. Moreover, the penetration of mobile phone handsets and the diffusion of mobile technologies have been dramatically increasing in recent years. While it is still too early to predict that a mobile

phone will become the ultimate converged device, people already carry their mobile handsets anytime and anywhere and use them for different purposes.

According to a recent study by on global mobile data traffic forecast, Smartphones represent only 12% of total global handsets in use today, but they represent over 82% of total global handset traffic (Cisco, 2012). Moreover, the number of mobile phone subscriptions reached almost 6,000 million at the end of 2011, representing a penetration rate of 86.7% worldwide and 78.8% in developing countries (ITU, 2012). Hence, during the period from Sep. 2011 to Sep. 2012, on an average around 265,000 applications were registered in the US App Store (Scott, 2012), and 140,000 application were registered in Android Market during same period (AndroLib, 2012).

1.1 Aims and Objectives

As the use of ICT expands globally, there is need for further research into cultural and technical aspects and implications of ICT. The acceptance of IT has become a fundamental part of the research plan for most organizations (Igbaria 1993). A better understanding of the factors contributing to the acceptance or rejection of IT is the first step toward the solution of the problem.

User acceptance is often the pivotal factor and a central focus of Information Systems (IS) implementation research in determining the success or failure of an IT product (Swanson, 1988; Davis et al, 1989; Thompson et al, 1991; Davis, 1993; Igbaria, 1993). Availability of IT does not necessarily lead to its acceptance. Most information system failures result from a lack of user acceptance rather than poor quality of the system (Torkzadeh and Angulo, 1992; Igbaria, 1993; Davis, 1993).

1.2 Research Questions

The focus of this research is on the underlying reasons behind end users' acceptance or rejection of mobile Internet as a mean of ICT. Thus the important question that is addressed in this research is:

What are the factors that contribute to Information and Communication Technology acceptance and use, and in particular mobile Internet acceptance and use?

This research aimed to explore, explain, and analyze the influential determinants on the adoption and implementation of mobile Internet as a mean of ICT from a consumer perspective. The research program seeks to detect the different constructs and variable affecting the adoption process by examining the acceptance and use of mobile Internet on Saudi consumers as a case of a developing country. Hence, the aims and objectives of this research are:

- To identify the major constructs of the ICT adoption and use;
- To investigate the adoption and use of mobile Internet by individuals in the Kingdom of Saudi Arabia (KSA) as an example of a developing country.
- To quantify constructs concerning the current state of consumer beliefs and attitudes toward mobile Internet, and develop and validate the relationships between the factors that drive the adoption and acceptance of such services.
- To propose opportunities for both participants and researchers to uncover unseen problems, thereby improving the use and acceptance of ICT.
- To investigate the impact of the Saudi culture - social norms and believes - on the Adoption and use of ICT; and
- To use the results of the research to suggest ways of improving the adoption and use of ICT in the KSA towards bridging the digital divide between the KSA and the developed countries.

1.3 Practical and Theoretical Value of the Research

ICT use has proliferated throughout most sectors of the economies of developed countries. Over the last decade the business world has changed so rapidly, that one can no longer imagine managing in a steady state. In no other domain has this observation been more relevant than in the field of ICT.

Pilat and Lee (2001), showed that to capture the benefits of ICT it is not necessary to dispose of an ICT producing sector. Timely diffusion of new technology or, from the firm's point of view, its adoption is a key element to securing economic growth. As mobile Internet plays an important role in the explosion of ICT, consumers' acceptance behavior needs to be understood. A greater understanding of the factors that impact this behavior could help organizations develop appropriate ICT adoption strategies. What little research there has been on ICT acceptance is general and this research aims to expand this field by probing the consumers' acceptance of information and communication technologies.

In the technologically developed world, IT adoption is faced by barriers, such as the lack of top management support, poor quality IS design and inadequately motivated and capable users (Kwon and Zmud, 1987). In the developing world, the same barriers appear to be often impenetrable (Danowitz et al., 1995; Knight, 1994). In addition, problems found in developing counties are attributed to a lack of national infrastructure (Odedra et al., 1993), capital resources, or government policies set in place to prevent technology transfer (Goodman and Green, 1992).Although there are isolated reports of countries where sufficient resources and government support exist, the technology has failed to be effectively transferred (Atiyyah, 1989; Goodman and Green, 1992). While the uses of IT are varied, the common tie of technology use in the developing counties is one of limited diffusion (Goodman and Green, 1992).

From the practical perspective Saudi Arabia, the world's largest oil producer and it has the largest and fastest growth of ICT marketplaces in the Arab region (AlGhamdi et al, 2012). Hence, practitioners, managers and decision makers in the Saudi IT and telecommunication sectors are in need of information about how their customers act and react. The penetration of mobile phone handsets and the diffusion of mobile technologies have been dramatically increasing in recent years. While it is still too early to predict that a mobile phone will become the ultimate converged device, people already carry their mobile handsets anytime and anywhere and use them for different purposes.

1.4 Research Methodology

Research is an accepted investigation to find answers to a problem. Deciding on the appropriate research methodology is an essential part in defining the steps to be taken toward the completion of the research (Leedy, 2005). The methodology itself outlines all the essential steps to be followed in gathering and analyzing the data for the research.

This research study hoped to investigate the relative impact of factors contributing to mobile Internet as a mean of Information and Communications technology acceptance across several consumers with different ages, experience, and educational backgrounds. Davis et al (1989), Thompson et al (1991), Igbaria (1993), and Davis (1993) attempted something similar when investigating the acceptance of IT. Their experience indicated a sample size more than 100 would be needed if statistical analysis was to be conducted satisfactorily with control variables.

The methodology to be used for this research incorporates the four phases of: data collection; data reduction; data display; and the verification and drawing of conclusions. The data for analysis would be collected from normal people across the Kingdom of Saudi Arabia using online questionnaire techniques.

In general, this research will go through three successive stages:

- Building the research model;

- Research design; and
- Analysis.

The first stage provided the research framework for the study based on a theory from social psychology and an application model of IT acceptance and use. The second stage led to the choice of the 'self-administered questionnaire' as a suitable research strategy and to a definition of the study sample. This stage provided the research data from 624 individuals of different educational and industrial backgrounds. In the third stage the data will be analyzed using different analysis techniques of varying levels of sophistication.

A clear advantage of the survey approach was that it had been proven by the above mentioned works as an effective method for the collection of data on IT acceptance. Moreover, with the online survey method it is theoretically possible to collect data from a large number of individuals in a wide geographical area. Thus, allowing quantitative analysis in the testing of hypotheses and also the potential to generalize the findings to similar types of consumers in different means of Information and communications technologies.

The research model includes eight factors. Each factor was measured with multiple items. All items were adapted from extant literature to improve content validity (Straub et al., 2004). These items were first translated into Arabic by a researcher. Then another researcher translated them back into English to ensure consistency. When the instrument was developed, it was tested among ten users that had rich mobile Internet usage experience. Then according to their comments, we revised some items to improve the clarity and understandability.

Figure 1.1 presents the research model and the relationship between the eight constructs, moderating variables and the behavioral intentions towards the use of ICT.

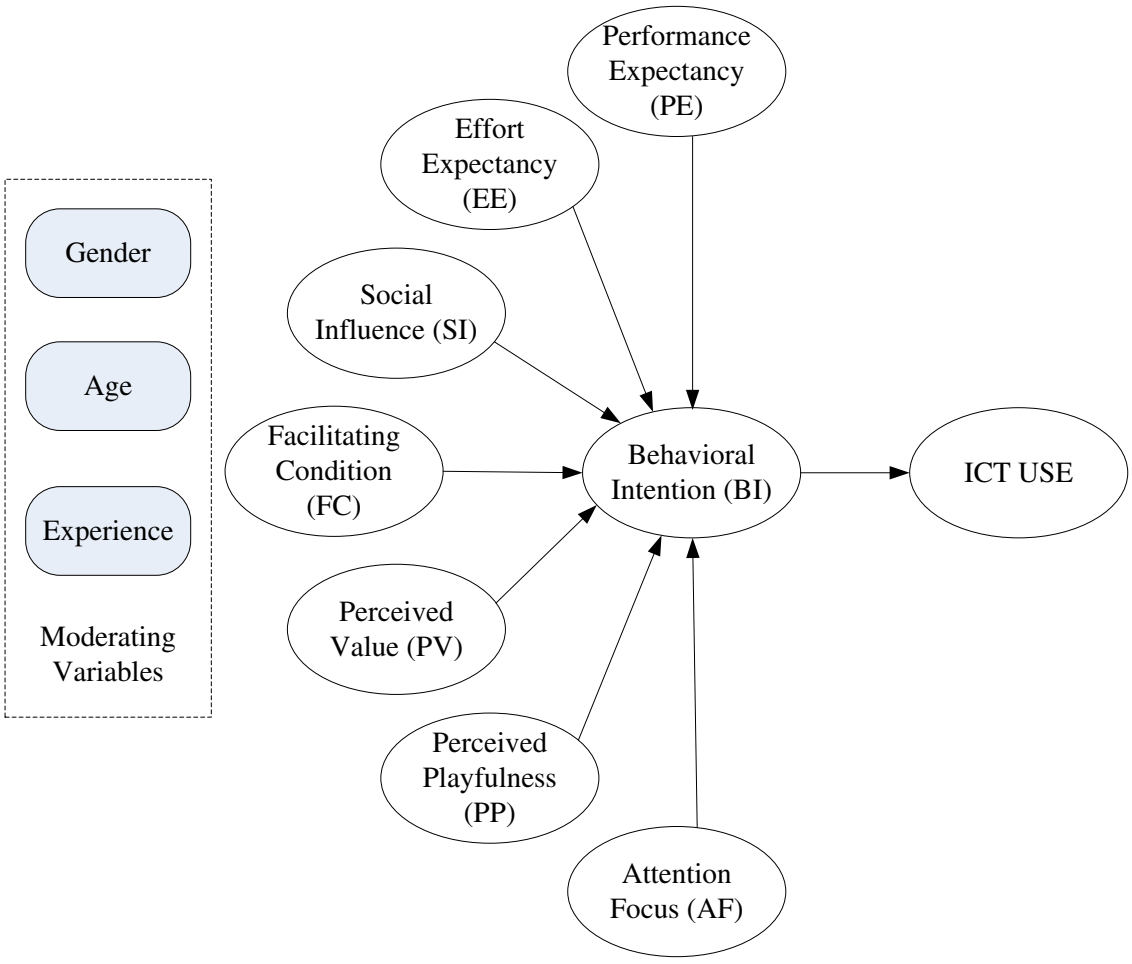

FIGURE 1.1 - THE PROPOSED RESEARCH MODEL

1.5 Limitations of Scope

This research is explanatory and cross-sectional in design, focusing on the explicit boundaries of the research problem described in section 1.2. The study examined the influential factors on the adoption and use of mobile Internet as a mean of ICT in Saudi Arabia. Hence, this research was limited one representative technology of ICT. This research concentrated only on the consumers in the Kingdome of Saudi Arabia, who have their specific demographic and socio-economic profiles. The data collection phase for this research was conducted between May 2012 and November 2012.

2 Literature Review

Information and communications technology or ICT, is often used as an extended synonym for Information Technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications, computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information. ICT is an interdisciplinary area of research driven and shaped by the fast development of computing, communication, and Internet-related technologies, which have a great impact on our societies and daily lives. Over the last few decades there has been an increase in ICT research, which has changed and shaped the way societies and organizations operate and produce their goods and services. It is not only the generation of new technology but also, and perhaps even to a higher extent, its diffusion throughout the economy which affects productivity growth at the macro-level.

Agarwal (2000) defines technology adoption as the use, or acceptance of a new technology, or new product. Moreover, understanding individual acceptance and use of IT is one of the most mature streams of information systems research. The Internet and mobile technology, the two most dynamic technological forces in modern information and communication technologies are converging into one ubiquitous mobile Internet service, which will change our way of both doing business and dealing with our daily routine activities. There is no doubt that the mobile Internet service is moving toward the new generation on which enables mobile users to enjoy a variety of new and upgraded multimedia mobile services.

It is not only the generation of new technology but also, and perhaps even to a higher extent, its diffusion throughout the economy which affects productivity growth at the macro-level. Pilat and Lee (2001), showed that to capture the benefits of ICT it is not necessary to dispose of an ICT producing sector. Timely diffusion of new technology or, from the firm's point of view, its adoption is a key element to securing economic growth.

ICT use has proliferated throughout most sectors of the economies of developed countries. In the recent years, the mobile industry as a whole has been growing at an increasing pace (Liu & Li, 2011). Despite the recent downturn following the global financial crisis, the mobile industry has stayed relatively unscathed. With the so-called smart phone revolution, where advanced mobile devices are starting to see mass-adoption, the demand for more sophisticated mobile services is on the rise. Moreover, the penetration of mobile phone handsets and the diffusion of mobile technologies have been dramatically increasing in recent years. While it is still too early to predict that a mobile phone will become the ultimate converged device, people already carry their mobile handsets anytime and anywhere and use them for different purposes.

According to a recent study by on global mobile data traffic forecast, Smartphones represent only 12 percent of total global handsets in use today, but they represent over 82 percent of total global handset traffic (Cisco, 2012). Moreover, the number of mobile phone subscriptions reached almost 6,000 million at the end of 2011, representing a penetration rate of 86.7 percent worldwide and 78.8 percent in developing countries (ITU, 2012). Hence, during the period from Sep. 2011 to Sep. 2012, on an average around 265,000 applications were registered in the US App Store (Scott, 2012), and 140,000 application were registered in Android Market during same period (AndroLib, 2012).

2.1 ICT Acceptance

As the use of ICT expands globally, there is need for further research into cultural aspects and implications of ICT. The acceptance of IT has become a fundamental part of the research plan for most organizations (Igbaria 1993). A better understanding of the factors contributing to the acceptance or rejection of IT is the first step toward the solution of the problem.

User acceptance is often the pivotal factor and a central focus of Information Systems (IS) implementation research in determining the success or failure of an IT product (Swanson, 1988; Davis et al, 1989; Thompson et al, 1991; Davis, 1993; Igbaria, 1993). Availability of IT does not necessarily lead to its acceptance. Most information system failures result from a lack of user acceptance rather than poor quality of the system (Torkzadeh and Angulo 1992, Igbaria 1993, Davis 1993).

Previous research into user acceptance of IT has mainly concentrated on users' attitudes toward acceptance while neglecting the role of social norms. It was also noticed that few IT characteristics were researched and these were not approached in a coherent manner (e.g., Davis 1989, Thompson et al 1991, Igbaria 1993, and Davis 1993). Thus, it was recognized that the study would need to consider a broad range of IT characteristics and investigate the normative side of the equation besides that of attitudes toward usage.

ICT use has proliferated throughout most sectors of the economies of developed countries. Over the last decade the business world has changed so rapidly, that one can no longer imagine managing in a steady state. In no other domain has this observation been more relevant than in the field of ICT.

As mobile Internet plays an important role in the explosion of ICT, consumers' acceptance behavior needs to be understood. A greater understanding of the factors that impact this behavior could help organizations develop appropriate ICT adoption strategies. What little research there has been on ICT acceptance is general and this study aims to expand this field by probing the consumers' acceptance of information and communication technologies.

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found in developing counties are attributed to a lack of national infrastructure (Odedra et al., 1993), capital resources, or government policies set in place to prevent technology transfer (Goodman and Green, 1992).Although there are isolated reports of countries where sufficient resources and government support exist, the technology has failed to be effectively transferred (Atiyyah, 1989; Goodman and Green, 1992). While the uses of IT are varied, the common tie of technology use in the developing counties is one of limited diffusion (Goodman and Green, 1992).

2.2 Review of Technology Acceptance Theories

In ICT research, numerous theories are used to understand users' adoption of new technologies.

Researchers have attempted to predict and explain user behavior across many IS and IT domains, seeking to investigate and develop theory as to how to improve usage and examine what inhibits usage and intention to use the technology (Venkatesh, Morris, Davis, & Davis, 2003). To develop the conceptual framework for our model it is useful to draw comparisons between the various theories. The theories based on intention of ICT adoption such as Technology Acceptance Model –TAM- (Davis, 1989; Venkatesh & Davis, 2000) and Theory of Planned Behavior –TPB- (Taylor & Todd, 1995; Venkatesh & Morris, 2000) have shown that the adoption and usage of an IT system is eventually determined by the users' personal beliefs and attitudes toward the technology. Other models such as IDT state that user's perception of the characteristics of an innovation is more significant (Rogers, 1995).

2.3 Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (IDT) notes that relative advantage, complexity, compatibility, trialability and observability predict user adoption (Rogers, 1983). Rogers (1995) defined an innovation as an idea or practice that is perceived as new by the adopting organization. Braun (2004) argued that Rogers Innovation Diffusion Theory (IDT) analyzed the process of diffusion, and mapped the impact of a combination of

social, economic, and technical forces on that process. There is a general agreement among researchers that IDT is a suitable and valid theory for examining the process of adoption. In a research conducted by Jeyaraj, Rottman and Lacity (2006) on adoption IT by individuals and organizations, IDT was recognized as the only theory which has been used to evaluate adoption on the individual and organizational level. Looi (2004) suggested that the Rogers' innovation diffusion theory is perhaps the most frequently cited theory in most research on diffusion of innovation. Looi (2004) stated that Rogers' theory is considered valuable because it attempts to explain the factors which influence the adoption of an innovation and the manner in which new innovations are disseminated through social systems over time. El-hadary (2001) emphasized that one of the major contributions of IDT is the innovation decision process, which starts with one's knowledge about the existence of the innovation and ends with the confirmation of the adoption/rejection decision.

2.4 Theory of Reasoned Action (TRA)

The theory of reasoned action (TRA) is a widely studied model from social psychology which is concerned with the determinants of consciously intended behaviors (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). The foundation of the TRA conceptual framework is provided by the distinction between beliefs, attitudes, intentions, and behaviors. The major concern of the conceptual framework, however, is with the relations between these variables, as shown in figure 2.1.

According to TRA, a person's performance of a specified behavior is determined by his or her behavioral intention to perform the behavior, and behavioral intention is jointly determined by the person's attitude and subjective norms concerning the behavior in question. TRA is a general model as it does not specify the beliefs that are operative for a particular behavior. Therefore, researchers using TRA must first identify the beliefs that are salient for subjects regarding the behavior under investigation (Davis et al 1989).

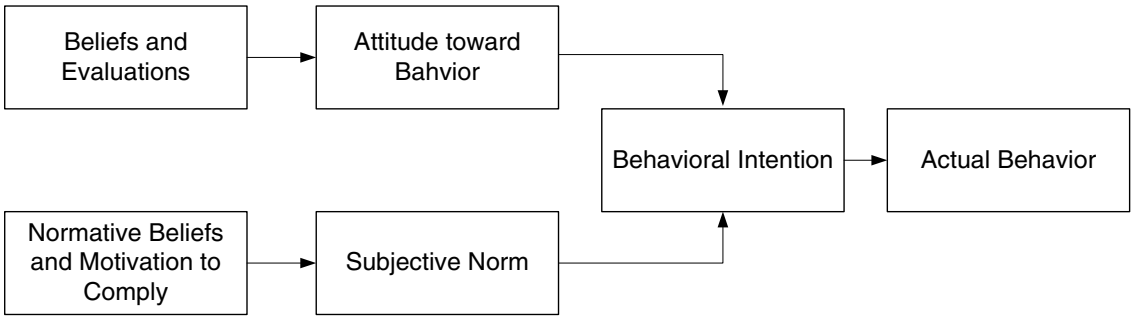

FIGURE 2.1 - THEORY OF REASONED ACTION (FISHBEIN & AJZEN 1975)

2.5 Theory of Planned Behavior (TPB)

The theory of planned behavior (TPB) goes beyond the theory of reasoned action (TRA) and incorporates a further construction, specifically perceived behavior control (PBC); this accounts for those situations where control over the target behavior is not fully volitional (Ajzen, 1985). TPB is considered as to be among the more influential of the theories in predicting and explaining behavior (Sheppard et al, 1985). Various studies showed the applicability of TPB to various domains, and verified the ability of this theory in providing a valuable framework to explain and predict the accepting of new IT (Hung et al, 2006). The new construct PBC was defined as the "perception of ease or difficulty of performing the behavior of interest" (Ajzen, 1991).

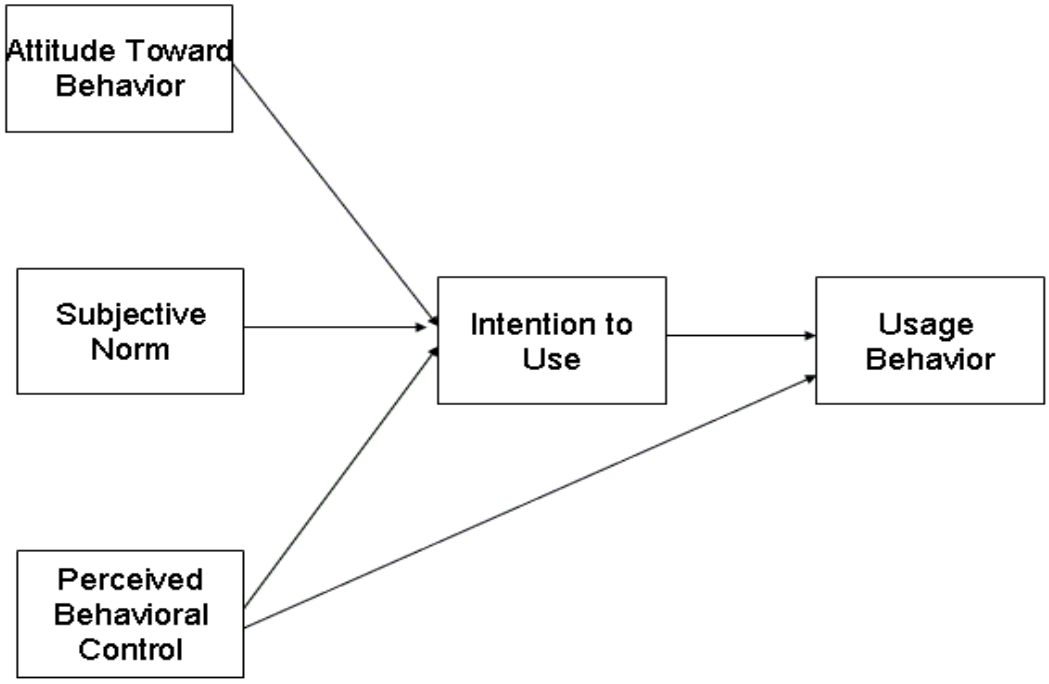

FIGURE 2.2 - THEORY OF PLANNED BEHAVIOR

Under TPB, the explanation of a person's behavior lies in their behavioral intention as shown in figure 2.2; this is influenced by perceived behavioral control, attitude and subjective norms (Alzahrani and Goodwin, 2012). Perceived behavioral control describes the perceptions an individual has regarding the absence or presence of the resources required or requisite opportunities to perform the target behavior. Attitude refers to the negative or positive way the individual evaluates the performance effect of a given behavior. The subjective norms are an individual's perceptions of how others will view their performance of a given behavior.

2.6 Technology Acceptance Model (TAM)

Originally introduced by Fred Davis as early as in the 1980s, the Technology Acceptance Model (TAM) sought to measure the willingness of people to accept and adopt new IT innovations of that era, such as the electronic mail systems (Davis 1989). The model had two main determinants which explained IT adoption: Perceived Usefulness and Perceived Ease of Use. In his work, Davis (1989) defined them as "the degree to which a person

believes that using a particular system would enhance his or her job performance" and "the degree to which a person believes that using a particular system would be free of effort", respectively. Contrary to his hypothesis, Davis (1989) reported that the relationship between perceived usefulness and adoption was significantly stronger than that of between perceived ease of use and adoption. Furthermore, he noted that perceived ease of use might even precede perceived usefulness, suggesting the existence of a causal relationship instead of the independence of the determinants.

Figure 2.3 above suggests an interpretation that respondents tend to consider the usefulness of a new system before making a decision to use it. However, the easier the system is perceived to be, the more useful it becomes in the minds of the people, thus improving the overall perception and leading to increased usage. Still, there is a certain limitation to how usage is measured in the study, as Davis (1989) duly stated. In his study, usage was subjective and self-reported, and not based on any standard measures.

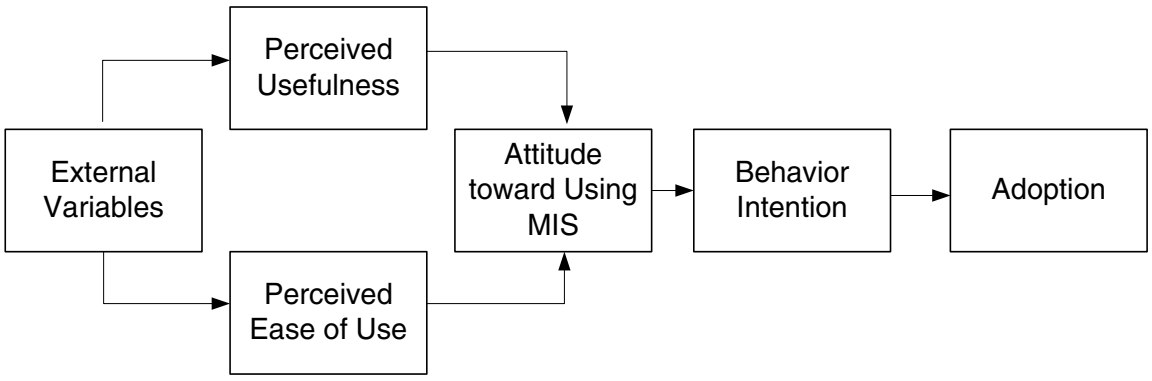

FIGURE 2.3 - TECHNOLOGY ACCEPTANCE MODEL (DAVIS 1989)

In 2000, Davis collaborated with Professor Venkatesh to bring about the first overhaul of his original theory. Venkatesh and Davis (2000) introduced two sets of additional processes in TAM2 compared to the previous model: Social Influence process and cognitive instrumental process. Social influence originates from the concept of subjective norm in the Theory of Reasoned Action (TRA) and Cognitive instrumental process, on

the other hand, turned out to be an addition that did not survive the test of time and, consequently, did not appear in any relevant subsequent studies. Figure 2.4 details the full TAM2 with the additional elements built around the original TAM. The findings of the Venkatesh and Davis (2000) study show that the old theory still holds for the modern times, while the additional processes improve the explanatory ability of the model, and that especially the concept of subjective norm yields some interesting results.

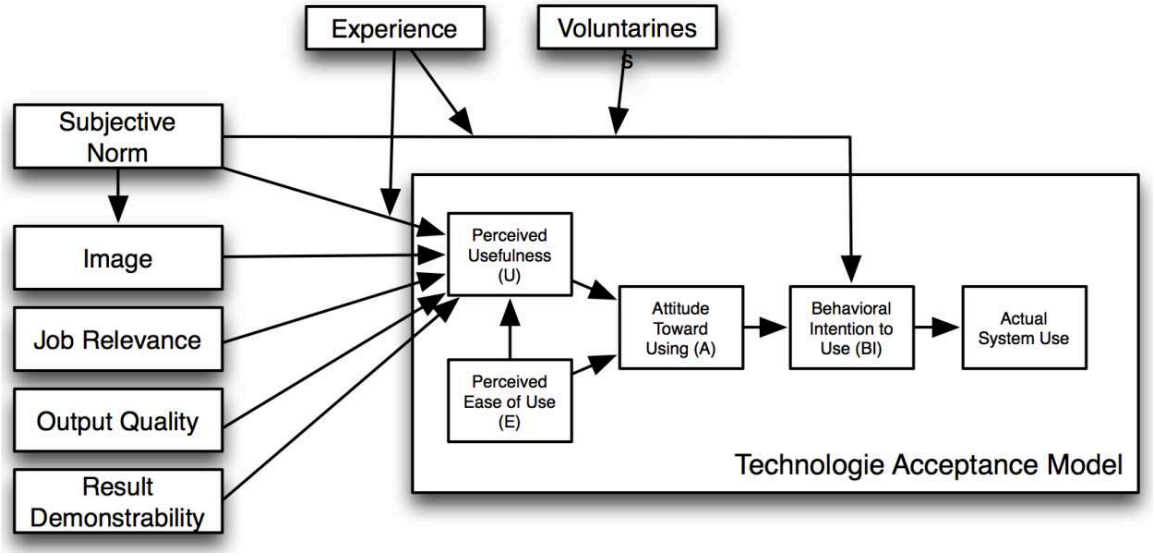

FIGURE 2.4 - TECHNOLOGY ACCEPTANCE MODEL 2 (VENKATESH AND DAVIS, 2000)

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

UTAUT was developed by Venkatesh et al. (2003) to predict user adoption of an IT. UTAUT integrated eight theories, including the TAM, IDT, the theory of reasoned action (TRA), the motivational model, the theory of planned behavior (TPB), a model combining the TAM and TPB, the model of PC utilization and social cognitive theory (SCT). With empirical analysis, Venkatesh et al. (2003) found that performance expectancy; effort expectancy, social influence and facilitating conditions are the main factors determining user adoption. Among them, performance expectancy is similar to

perceived usefulness and relative advantage. Effort expectancy is similar to perceived ease of use and complexity.

Social influence is similar to subjective norm. Since its inception, UTAUT has been used to explain user adoption of a variety of information technologies, including location-based services (Xu and Gupta, 2009), mobile technologies (Park et al., 2007), mobile banking (Zhou et al., 2010), Internet banking (Im et al., 2011), and health information technologies (Kijsanayotin et al., 2009).

As can be seen from figure 2.5, the UTAUT streamlined the social influence concepts presented in TAM2 and moved some of the elements such as experience and voluntariness of use into background variables (moderating effects).

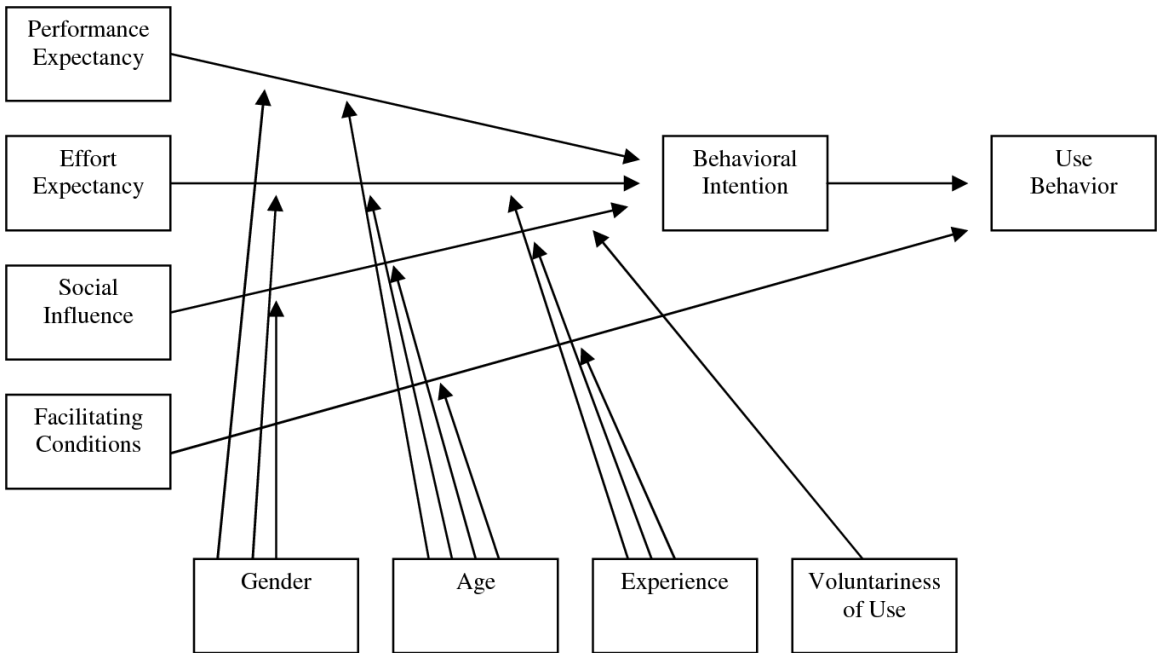

FIGURE 2.5 - UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (VENKATESH ET AL, 2003)

Despite criticisms, Venkatesh et al. (2003) confirmed that conceptually, UTAUT was able to represent the majority of the eight separate models which formed its basis. The findings were also in line with prior research, noting that performance expectancy (the

equivalent of perceived usefulness) was the most important predictor of intention. The paper also further underlined the importance of social influence, introduced in TAM2, with similar results to the earlier study by Venkatesh and Davis (2000).

However, while the UTAUT model was a further improvement from TAM2, there were still clear limitations and even drawbacks that came with the added complexity. Although UTAUT reportedly explained up to 70% of variance in usage, one of the limitations the authors reported has to do with the practicalities and the way the analysis was conducted: According to Venkatesh et al. (2003), they only used those research questions, whose answers carried most weight in analyzing each of the core constructs (e.g. performance expectancy, effort expectancy etc.).

What this effectively meant is that sometimes the richer and more diverse items in one or more of the eight underlying models were discarded due to their limited impact, thus resulting in lesser representativeness and validity of the findings. The increasing complexity with each revision of the model was also starting to attract vocal criticisms towards it. In 2007, Bagozzi (2007) recognized the wide adoption of Davis's (1989) original model and its later extensions, but at the same time pointed out several shortcomings. One of the points he made was the fact that the latest UTAUT revision adds so many different variables that it made the whole model difficult to use.

A year later, van Raaij and Schepers (2008) further criticized that in trying to incorporate multiple models into one, UTAUT actually became a complex system whose individual constructs (specifically social influence and facilitating conditions) were combinations of too many different factors and therefore representative of none. They also claimed that the 70% explanatory power is only achieved by introducing the moderating elements, so inherently the model was not much better than TAM or TAM2.

Accordingly, van Raaij and Schepers (2008) ended up using a modified version of TAM2 instead of the UTAUT model as the basis of their own study on technology acceptance.

However, not all feedback has been as negative as shown above. Despite having been critical towards the diverse body of whole TAM research, Verdegem and Marez (2011) commended the UTAUT model for being robust and relevant in the terms of bridging the theoretic and the empirical world. Riffai et al (2012) summarizes the characteristics and criticisms of the technology acceptance theories as shown in table 2.1.

TABLE 2.1 - TECHNOLOGY ACCEPTANCE THEORIES: CHARACTERISTICS, AND CRITICISMS

Theory	Characteristics	Stages	Weaknesses	Authors
Innovation Diffusion Theory (IDT)	Explores how, why and at what rate an idea, practice, or product (including service) spread through cultures.	Innovation-decision process is in five stages: (1) from first knowledge of an innovation, (2) to forming an attitude toward the innovation, (3) to a decision to adopt or reject, (4) to implementation of the new idea, and (5) to confirmation of this decision	Much evidence used in the development came from medical and agricultural contexts. Presumes technology is static. The S curve is a series of curves from various adopters of innovations so is not a single point in time. Pro-innovation bias, issues of equality and issues of recall emerge.	[Rogers, 1962] and [Rogers, 1995]
Theory of Reasoned Action (TRA)	TRA suggests that a person's behavior is determined by their intention to perform the behavior. This is turn is a function of their attitude toward the behavior and subjective norm.	Two main intention determinants: (1) attitude toward behavior (2) subjective norm related to behavior	Sheppard, Hartwick, & Warshaw (1988) indicate limiting factors relating to the use of attitudes and subjective norms to predict intentions, and the use of intentions to predict the performance of behavior. The limits are: Goals vs. behaviors: distinction between a goal intention and an actual behavioral	Ajzen and Fishbein (1980), Leac h, Hennessy, & Fishbein (1994),Davis et al. (1989),Han (2003),Shepp ard et al. (1988) and H ale, Householder, & Greene (2003)

Theory	Characteristics	Stages	Weaknesses	Authors
			intention. The choice among alternatives: the presence of choice can significantly change the nature of the intention formation process and the role of intentions in the performance of behavior Intentions Vs. estimates: what one intends to do and actually expects to do are different. Hale et al. (2003) claim TRA excludes a wide range of behaviors such as spontaneity, impulse, habits, cravings, or mindlessness	
Theory of Planned Behavior (TPB)	TPB was proposed as an extension of the TRA applied to behaviors that are not entirely under volitional control. Therefore, Perceived Behavior Control (PBC) was introduced as an independent predictor of intention in TPB to deal with situations where an individual lacks the control or resources necessary for performing the targeted behavior.	TPB, human behavior is guided by three kinds of belief: (1) Behavioral beliefs - beliefs about the likely outcomes of the behavior and the evaluations of these outcomes. (2) Normative beliefs which refer to the perceived behavioral expectations of such important referent individuals or groups. These beliefs result in perceived social pressure or	Compared to affective processing models, TPB overlooks emotional variables such as threat, fear, mood and negative or positive feeling. Thus assesses them in a limited way. Most of the research is circumstantial, correlational, and not evidence based on experimental studies.	Chau and Hu (2002), TCW (2004) and [Ajzen, 1991] and [A jzen, 2002]

Theory	Characteristics	Stages	Weaknesses	Authors
		subjective norm. (3) Control beliefs - beliefs about the presence of factors that may facilitate performance of the behavior and the perceived power of these factors.		
Technology Acceptance Model (TAM/TAM2))	TAM used TRA as a theoretical basis for making linkage between perceived usefulness and perceived ease of use and users' attitudes, and intentions and actual computer usage behavior. TAM theorized that perceived usefulness and perceived ease of use, mediate the effects of external variables, such as training, system characteristics, development process, on intention to use the system. TAM2 includes subjective norms as additional determinants of intention to use technology.	In TAM, attitude is determined by perceived ease of use (PEOU) and perceived usefulness (PU). TAM therefore replaces TRA's attitude determinants by perceived usefulness and perceived ease of use.	TAM has been widely criticized, despite its frequent use. Criticisms of TAM as a "theory" include its lack of falsifiability, questionable heuristic value, limited explanatory and predictive power, triviality, and lack of practical value (Chuttur, 2009). Independent attempts by several researchers to expand TAM in order to adapt it to the dynamic IT environments have led to a "state of theoretical chaos and confusion" (Benbasat & Barki, 2007). In general TAM focuses on the individual 'user' of a computer, with the concept of 'perceived usefulness' and ignores the essentially social processes of IS development and implementation. For	Davis (1989), Yiu et al. (2007), Davis et al. (1989),Venkatesh and Davis (2000),Bagozzi (1992), Chuttur (2009),Bagozzi (2007)and Benbasat and Barki (2007)

Theory	Characteristics	Stages	Weaknesses	Authors
			further critique of TAM see Bagozzi (2007).	
Unified Theory of Acceptance and Use of Technology (UTAUT)	From a theoretical viewpoint, UTAUT provides a refined view of how the determinants of intention and behavior evolve over time	UTAUT holds four key constructs as direct determinants of usage intention and usage behavior: (1) performance expectance (2) effort expectancy (3) social influence (4) facilitating conditions Gender, age, experience and voluntariness of use are the key moderators used in UTAUT	Bagozzi (2007) critiqued the UTAUT as a model with 41 independent variables for predicting intentions and at least 8 independent variables for predicting behavior, claiming technology adoption was "reaching a stage of chaos." Van Raaij and Schepers (2008) criticized UTAUT as being less parsimonious than TAM/2 because its high coefficient of determination is only achieved when moderating key relationships with up to four variables. They also claimed the grouping and labeling of constructs problematic as a variety of disparate items were combined to reflect a single psychometric construct.	Venkatesh et al. (2003), Bagozzi (2007) and Van Raaij and Schepers (2008)

3 Conceptual Model and Hypotheses

As the use of ICT expands globally, there is need for further research into cultural aspects and implications of ICT. The acceptance of IT has become a fundamental part of the research plan for most organizations (Igbaria 1993). A better understanding of the factors contributing to the acceptance or rejection of IT is the first step toward the solution of the problem.

3.1 Research Question

User acceptance is often the pivotal factor and a central focus of Information Systems (IS) implementation research in determining the success or failure of an IT product (Swanson, 1988; Davis et al, 1989; Thompson et al, 1991; Davis, 1993; Igbaria, 1993). Availability of IT does not necessarily lead to its acceptance. Most information system failures result from a lack of user acceptance rather than poor quality of the system (Torkzadeh and Angulo, 1992; Igbaria, 1993; Davis 1993).

The focus of this research is on the underlying reasons behind end users' acceptance or rejection of mobile Internet as a mean of ICT. Thus the important question that is addressed in this study is:

What are the factors that contribute to Information and Communication Technology and in particular mobile Internet acceptance and use?

Previous research into user acceptance of IT has mainly concentrated on users' attitudes toward acceptance while neglecting the role of social norms. It was also noticed that few IT characteristics were researched and these were not approached in a coherent manner (e.g., Davis 1986, Davis et al 1989, Thompson et al 1991, Igbaria 1993, and Davis 1993). Thus, it was recognized that the study would need to consider a broad range of IT characteristics and investigate the normative side of the equation besides that of attitudes toward usage.

This research aimed to explore, explain, and analyze the influential determinants on the adoption and implementation of mobile Internet as a mean of ICT from a consumer perspective. The research program seeks to detect the different constructs and variable affecting the adoption process by examining the acceptance and use of mobile Internet on Saudi consumers as a case of a developing country.

3.2 Research Model and Hypotheses

Agarwal (2000) defines technology adoption as the use, or acceptance of a new technology, or new product. In Information Technology and Information System (IT/IS) research, numerous theories are used to understand users' adoption of new technologies. Various models were developed including the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Innovation Diffusion Theory (IDT), Task Technology Fit (TTF), and recently, the Unified Theory of Acceptance and Use of Technology (UTAUT) are often used as the theoretical bases. Each of these models has sought to identify the factors which influence a citizen's intention or actual use of IT.

TAM proposes that perceived ease of use and perceived usefulness are two main beliefs affecting user adoption (Davis, 1989). Due to its parsimony, TAM has been used to explain user adoption of various mobile services, including mobile payment (Chandra et al., 2010), short message services (Lu et al., 2010), mobile shopping (Lu and Su, 2009), mobile ticketing (Mallat et al., 2009), and mobile Internet (Shin et al., 2010).

IDT notes that relative advantage, complexity, compatibility, trialability and observability predict user adoption (Rogers, 1983). IDT has been examined in the context of multimedia message services (Hsu et al., 2007), mobile payment (Mallat, 2007), and mobile banking (Lin, 2011). TTF proposes that only when task characteristics fit technology characteristics will user performance be improved (Goodhue and Thompson,

1995). TTF has been used to examine user adoption of location-based services (Junglas et al., 2008), and mobile work (Yuan et al., 2010).

UTAUT was developed by Venkatesh et al. (2003) to predict user adoption of an IT. UTAUT integrated eight theories, including the TAM, IDT, the theory of reasoned action (TRA), the motivational model, the theory of planned behavior (TPB), a model combining the TAM and TPB, the model of PC utilization and social cognitive theory (SCT). With empirical analysis, Venkatesh et al. (2003) found that performance expectancy, effort expectancy, social influence and facilitating conditions are the main factors determining user adoption. Among them, performance expectancy is similar to perceived usefulness and relative advantage. Effort expectancy is similar to perceived ease of use and complexity. Social influence is similar to subjective norm. Since its inception, UTAUT has been used to explain user adoption of a variety of information technologies, including location-based services (Xu and Gupta, 2009), mobile technologies (Park et al., 2007), mobile banking (Zhou et al., 2010), Internet banking (Im et al., 2011), and health information technologies (Kijsanayotin et al., 2009). Due to the relatively low adoption rate of mobile services, extant research has paid much attention to prior work of Venkatesh (2003, 2012) and Zohu (2011) when identifying the factors affecting mobile user behavior.

3.2.1 Performance Expectancy

Performance Expectancy (PE) reflects the perceived utility associated with using mobile Internet. Mobile Internet frees users from temporal and spatial limitations, and enables them to acquire information or services at anytime from anywhere. This can improve users' living and working performance and efficiency. According to the expectation confirmation theory, when users' expectation is confirmed, they will be satisfied (Bhattacherjee, 2001). Thus performance expectancy will affect user satisfaction. Extant research has also noted the effect of perceived usefulness (similar to performance expectancy) on satisfaction (Bhattacherjee, 2001; Lee et al., 2007a). In addition, performance expectancy will also affect continuance intention.

H1: Performance Expectancy will have a significant effect on behavioral intention towards using Information and Communication Technology.

3.2.2 Effort Expectancy

Effort Expectancy (EE) reflects the perceived difficulty of using mobile Internet. The constraints of mobile terminals such as small screens and inconvenient input have made it relatively difficult for users to search for information on mobile Internet (Lee and Benbasat, 2004). If users need to invest great effort on learning to use or skillfully using mobile Internet, they cannot feel satisfied. Thus effort expectancy will affect user satisfaction. In addition, users may discontinue their usage if mobile Internet service providers cannot present an easy-to-use interface to them. Prior research has revealed the effect of perceived ease of use (similar to effort expectancy) on user satisfaction (Lee et al., 2007a) and continuance usage (Shin et al., 2010).

H2: Effort Expectancy will have a significant effect on behavioral intention towards using Information and Communication Technology.

3.2.3 Social Influence

Social Influence (SI) reflects the effect of referees' opinion on individual user behavior (Zhou, 2011). According to social influence theory, users tend to comply with other important referees' opinions (Bagozzi and Lee, 2002). Thus when others who are important to a user recommend him or her to use mobile Internet, he or she may follow their suggestions. Hong et al. (2008) also found that social influence has a significant effect on the continuance intention of mobile data services.

H3: Social Influence will have a significant effect on behavioral intention towards using Information and Communication Technology.

3.2.4 Facilitating Conditions

Facilitating Conditions (FC) mean that users have the resources and knowledge necessary to use mobile Internet. Users need to bear the costs of using mobile Internet, such as communication fees and service fees. In addition, they need to be equipped with necessary knowledge to operate mobile Internet, which represents an emerging technology. If users do not own these resources and knowledge, they may not continue their usage of mobile Internet (Zhou, 2011).

H4: Facilitating Conditions will have a significant effect on behavioral intention towards using Information and Communication Technology.

3.2.5 Perceived Value

Perceived Value (PV) is defined as the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given (Zeithaml, 1988). In the case of mobile Internet, potential users would probably compare all the attributes of mobile Internet usage with prices of previous mobile phone calls and stationary Internet access. The price value is positive when the benefits of using a technology are perceived to be greater than the monetary cost and such price value has a positive impact on intention. Thus, we add price value as a predictor of behavioral intention to use a technology (Venkatesh et al, 2012)

H5: Perceived Value will have a significant effect on behavioral intention towards using Information and Communication Technology.

3.2.6 Perceived Playfulness

Perceived Playfulness (PP) reflects the pleasure and enjoyment associated with using mobile Internet. Perceived enjoyment is an intrinsic motivation that emphasizes the usage process, whereas perceived usefulness is an extrinsic motivation that emphasizes the outcome (Davis et al., 1992). Users expect to acquire enjoyment when they adopt mobile Internet to obtain ubiquitous information and services. When this expectation is met, users will feel satisfied. Thus perceived enjoyment may affect satisfaction. O'Cass and Carlson (2010) also noted that flow affects user satisfaction with professional sporting team websites. Lee et al. (2007b) reported that flow affects online banking users' satisfaction. In addition, perceived enjoyment may also facilitate continuance usage. If users cannot obtain enjoyment from using mobile Internet, they may discontinue their usage due to an unpleasant experience. The effect of perceived enjoyment on user behavior has been validated in extant research (Koufaris, 2002; Dickinger et al., 2008).

H6: Perceived Playfulness will have a significant effect on behavioral intention towards using Information and Communication Technology.

3.2.7 Attention Focus

Attention Focus (AF) reflects a user's immersion when using mobile Internet. Mobile users often perform multiple tasks on movement, such as listening to music and accessing mobile Internet. Thus their attention allocated to mobile Internet may be limited. If they cannot focus their attention, their experience may be affected (Zhou, 2011). This may decrease their satisfaction and continuance usage intention. Koufaris (2002) also noted that concentration (similar to attention focus) affects online shoppers' return intention.

H7: Attention Focus will have a significant effect on behavioral intention towards using Information and Communication Technology.

3.2.8 Behavioral Intention

Behavioral Intention (BI) is defined as a person's perceived likelihood or "subjective probability that he or she will engage in a given behavior" (Committee on Communication for Behavior Change in the 21st Century, 2002, p. 31).With increasing experience, consumers have more opportunities to reinforce their habit because they have more time to encounter the cues and perform the associated behavior (Kim and Malhotra 2005). With increasing experience, routine behavior becomes automatic and is guided more by the associated cues (Jasperson et al. 2005). As a result, the effect of behavioral intention on technology use will decrease as experience increases.

H8: Behavioral *Intention will have a significant effect on consumers' use of* Information and Communication Technology.

3.2.9 Moderating variable

Mediating Variables: Age, Gender, and Experience have been shown to exist in technology adoption contexts. In looking at gender and age effects, it is interesting to note that Levy (1988) suggests that studies of gender differences can be misleading without reference to age. Moreover, Venkatesh et al. (2003) posit that gender, age, and experience have moderating effects in the acceptance of IT, hence

H9: Age, Gender, and Experience will mediate the relationship between behavioral intention and the use of Information and Communication Technology.

Figure 3.1 presents the research model as well as the proposed hypotheses and relationship between the eight constructs, moderating variables and the behavioral intentions towards the use of ICT.

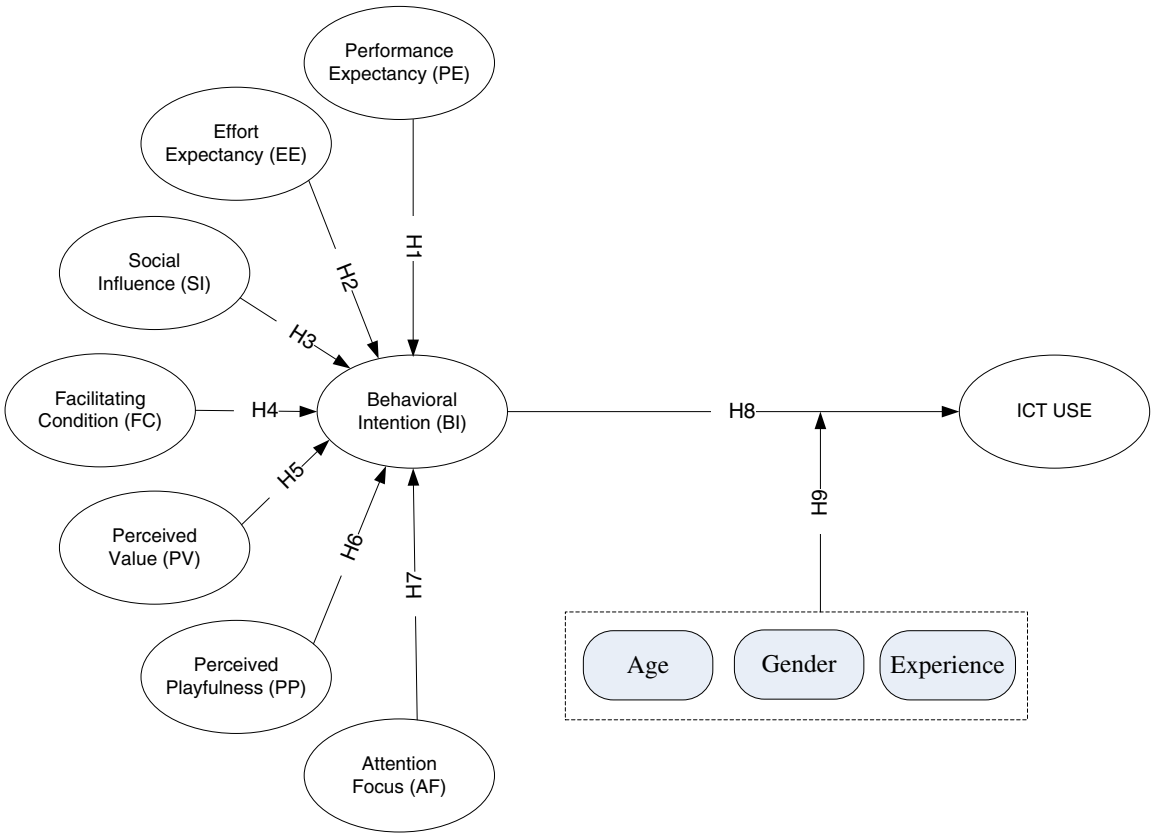

FIGURE 3.1 - THE PROPOSED RESEARCH MODEL WITH HYPOTHESES

4 Survey Research Design and Method

Information technology research includes the study of management, development, operation, the use, and influence of computer-based information systems (Zmud & Boynton, 1991). Quantitative research methods vary according to research objectives. Survey research is one of the most commonly used quantitative methods in IT research.

Survey methods and practices, which have grown rapidly with the development of computers, comprise a powerful tool for collecting data from multiple units of analysis and cases (Venkatesh & Vitalari, 1991). It is a widely accepted and utilized research method among social science and IS researchers in studying cross-cultural and organizations issues (Babbie, 1998; Bond, 1988; Cameron & Quinn, 1999; Hofstede, 1980; Schein, 1992; Straub et al., 1997; Thanasankit & Corbitt, 2000; Trompenaars, 1994). Survey research is also one of the most widely used method of IS researchers (Choudrie & Dwivedi, 2005; Mingers, 2003).

Researchers have also defined survey research according to their individual research objectives and disciplines. Fink (1995) defines 'survey' as "a system of collecting information to describe, compare, or explain knowledge, attitudes, and behavior" (p.1). It is a way of collecting information about the characteristics, attitudes, actions, or opinions of a large sample of people, cluster, organization, or other units referred to as a population. Survey research can be either cross-sectional or longitudinal.

Kraemer and Cash (1991) identify three different characteristics of the survey method. Firstly, it is designed to generate quantitative explanations of some feature of a population. Secondly, it gathers information by asking people structured, predefined questions. Thirdly, the data it collects is generally gathered from a portion of the study population and is collected in such a way as to be able to generalize findings to the population.

4.1 Survey Objectives

The objective of the survey in this study is to undertake cross-sectional exploratory research, examining the influential factors on the adoption and use of mobile Internet, as an example of ICT, in Saudi Arabia

4.2 Survey Research Design

A survey research design is a master plan detailing procedures for sampling and for choosing data gathering and analysis methods. Designing a good survey involves selecting the proper instrument and questions to meet the research purposes, testing them to make sure they can measure the intended purpose, and putting them into an easy format which respondents can understand and participate in effectively (Fowler, 2002).

Self-administrated questionnaires are one of the most frequently used methods for collecting data in research studies (Babbie, 1998; Bourque & Fiedler, 2003). In self-administrated questionnaires, the respondents are given the questionnaires and asked to fill them out in their own time and return them by mail, online, e-mail, or for collection by the researcher.

There are many advantages of using self-administrated questionnaires. The greatest advantage is their lower cost compared to other methods such as interviews. In addition, they are easy to administer to a large number of people and can be the most usable form of data gathering in survey research (Fowler, 2002). The disadvantages of this method are: low response rates; using the same questions to all respondents; respondents' ability to answer the questionnaire (language, literacy, competency); requirement for follow up; they are time consuming; they can be ignored as junk mail; and difficulty in getting mailing lists for respondents (Bourque & Fiedler, 2003). The present study utilizes a self-administered survey instrument to collect quantitative data because it was found to be the most suitable method to serve the purposes of the study.

4.3 Unit of Analysis

Survey research offers methods for studying almost all researchable concepts (Babbie, 1998). Defining the unit of analysis or the unit about which the conclusions are being drawn is an important component of research design (Benbasat, 1987; Yin, 1989). The unit of analysis must be decided before selecting cases, and must be adequate for answering research questions (Babbie, 1998). Unit of analysis may be an individual, a group, an entire organization, an event or phenomenon, or a specific project or decision (Darke, Shanks, & Broadbent, 1998) (p.372).

In this study, proposed theory testing, data collection, and analysis were conducted at the individuals' level in Saudi Arabia. Therefore, the unit of analysis for this study is the individual consumers in Saudi Arabia.

4.4 Research Instrument

Due to the lack of validated and reliable instrument in Arabic for assessing the influence of attitude, culture, and facilities on the adoption and use of ICT, the current study has replicated and translated widely-cited and used Western-developed instruments, which have been validated and found to be reliable. Three different types of questionnaire instruments from the literature were adopted for this research.

The questionnaire was designed in an online format by using an online survey service provider. In addition, different approaches were used to reach larger numbers of mobile Internet users in Saudi Arabia through using social networking email campaigns, and websites. Furthermore, the online questionnaire link was posted on several Internet forums and groups.

4.5 Pilot-Test

Validity refers to the ability of an instrument to measure what it purports to measure. A good method of guaranteeing that the chosen instrument would address its intended purpose is to conduct a pilot study, which will apply through the entire study from sampling to reporting. Conducting a small pilot study is valuable and is generally inexpensive (Babbie, 1998). Using a pilot study extends to replicating the instruments before commencing the real study and prevents any unforeseen problems that may occur. It is essential that the components need to be tested in realistic situations to ensure that everything will work.

Prior to data collection in the current research, a pilot study was planned and conducted during the period April – May 2012. The pilot study served as a useful training experience for administrating the questionnaire. Results and feedback from the pilot study were helpful in revising our questionnaire and changes were made accordingly. The researcher revised, reworded, and eliminated some of the questions in the questionnaire according to the results from the data collected, the pilot study, using the analysis of Cronbach's alpha, and comments made by the respondents, to put the questionnaire in its final usable version. Changes included:

1. Adjusting the wording of the Arabic version of the questionnaire to make it more understandable.
2. Reducing the number of questions.
3. Deleting questions that caused ambiguity.
4. Analyzing the data using Factor Analysis and Cronbach's Alpha.

4.6 Questionnaire Design

The research model includes eight factors as shown in figure 1.1. Each factor was measured with multiple items (Appendix A). All items were adapted from extant literature to improve content validity (Straub et al., 2004). These items were first

translated into Arabic by a researcher. Then another researcher translated them back into English to ensure consistency. When the instrument was developed, it was tested among ten users that had rich mobile Internet usage experience. Then according to their comments, we revised some items to improve the clarity and understandability.

The questionnaire included 32 different types of questions, such as dichotomous questions (yes/no) and these were used when the researcher was seeking the demographic profile of the respondents. Multiple-choice questions were used when the questions might have more than one possible answer. Measurement items in the questionnaire that covered the proposed constructs in the research model were derived from extant literatures as follows: Performance Expectancy (3 questions), Effort Expectancy (4 questions), Social Influence (2 questions), Facilitating Conditions (4 questions), and Behavioral Intentions (3 questions) were adapted Venkatesh et al. (2003). Perceived Playfulness (3 questions), and Attention Focus (3 questions) were adapted from adapted from Koufaris (2002), while the Perceived Value (3 questions) adapted from Venkatesh et al. (2012). Each items was measured on a five-point Likert scale (i.e., 1 = Strongly Agree; 5 = Strongly Disagree).

The questionnaire contained 32 questions, whereby:

- Questions 1-7 were designed to gather demographic information about the ICT consumers.
- Questions 8-10 provided answers to help identify and measure the performance expectancy factor.
- Questions 11-14 provided answers to help identify and measure the effort expectancy factor.
- Questions 15-16 provided answers to help identify and measure the social influence factor.
- Questions 17-20 provided answers to help identify and measure the facilitating conditions factor.

- Questions 21-23 provided answers to help identify and measure the perceived value factor.
- Questions 24-26 provided answers to help identify and measure the perceived playfulness factor.
- Questions 27-29 provided answers to help identify and measure the attention focus factor.
- Questions 30-32 provided answers to help identify and measure the behavioral intention factor.

The main research questionnaire questions are listed in Appendix B

4.7 Questionnaire Distribution and Data collection

After the questionnaire was designed, translated and tested, two version; English and Arabic, were uploaded to Qualtrics website (www.qualtrics.com), which is a leading global supplier of enterprise data collection and analysis website that enabled the researcher to collect data from different geographical locations in Saudi Arabia. The web-based questionnaire has ability to contact a huge volume of respondents and the cost of collection is minimized. The online survey design service offered by qualtrics.com gave the participants the ability to complete the questionnaire via the Internet, which offered greater convenience for them. Furthermore, the participants were more likely to respond faster when they receive the invitation email, which means that the responses may be collected more quickly. However, all personal information and responses were collected anonymously. The questionnaire was active and open for participation during the period of May-November 2012, before it was closed and data collection phase stated.

4.8 Descriptive Statistics

There were 624 usable responses collected out from the qualtrics online questionnaire. To analyze the respondents' profiles, the SPSS software was used by applying a descriptive analysis on the collected data.

4.8.1 Demographic Statistics

Table 4.1 provides an indication of the overall gender response rate. There were 85.7% male and 14.3% female respondents. Thus, the majority of the respondents were male. This ratio is consistent with cultural norms of the Saudi society.

TABLE 4.1 - DEMOGRAPHIC STATISTICS BY GENDER

Gender	Frequency	Percent
Male	**535**	**85.7**
Female	89	14.3
Total	624	100.0

Table 4.2 shows that 10.4% of the respondents were less than 20 years, 66.5% were in the range of 20 - 29 years old, 16.7% were in the range of 30 – 39 years, 5.6% were in the range of 40 – 49 years of age, and less than 1% were over 50 years old. This shows that the majority of the respondents, about 77%, were young - less than 29 years of age.

TABLE 4.2 - DEMOGRAPHIC STATISTICS BY AGE

Age	Frequency	Percent
Under 20	65	10.4
20 – 29	415	66.5
30 – 39	104	16.7
40 – 49	35	5.6
50 and above	5	.8

Table 4.3 shows that the educational level of the majority of the respondents was Bachelor's degree 52.7%, 10.3% were highly educated with a Master's degree and higher, 10.4% have diploma degree or still pursuing their first degree, 25.2% have a high school diploma, and less than 1.4% of the respondents have not yet earned their high school degree.

TABLE 4.3 - DEMOGRAPHIC STATISTICS BY EDUCATION

Educational Level	Frequency	Percent
Less than High School	9	1.4
High School	157	25.2
Some College/ Diploma	65	10.4
Bachelor Degree	329	52.7
Master Degree and Higher	64	10.3

In comply with the education and age profiles of the major respondents slice; your university students, table 4.4 shows that the majority of respondents have an income of less than 1000 Saudi Rials (1 USD = 3.75 SAR), 29% within the range of SAR 1000 - 4000, 9.8% within the range of SAR 4001 – 8000, 15.2% within the range of SAR 8001 – 14000, 3.8% within the range of SAR 14001 – 20000, and less than 3.4% of the respondents were enjoying the highest income rate of SAR 20000 and more.

TABLE 4.4 - DEMOGRAPHIC STATISTICS BY INCOME (IN SAUDI RIALS)

Income	Frequency	Percent
< 1000	242	38.8
1000 - 4000	181	29.0
4001 - 8000	61	9.8
8001 - 14000	95	15.2
14001 - 20,000	24	3.8
> 20,000	21	3.4

Table 4.5 shows that the majority of the respondents, 47%, were students, while construction and maintenance people were the lowest with less than 0.2% of the respondents. The rest of the respondents' occupations list and their percentages are shown in the table below.

TABLE 4.5 - DEMOGRAPHIC STATISTICS BY OCCUPATION

Occupation	Frequency	Percent
Management, professional, and related	28	4.5
Computer, IT, and Telecommunications	66	10.6
Banking, investment, and Finance	28	4.5
Medical and Health Profession	12	1.9
Construction, and maintenance	1	.2
Oil and Chemical industry	10	1.6
Logistics and Services	4	.6
Education and Training	30	4.8
Engineering	38	6.1
Business	22	3.5
Government Employee	19	3.0
Private Business	23	3.7
Student	296	47.4
Unemployed/ Retired	18	2.9
Other	29	4.6

Table 4.6 shows the respondents' experience with mobile Internet services. 26.6%, of the respondents have been using mobile Internet services since 2007 and before, 33.3% have been using it for about 3 – 5 years, 24.7% for about 1 – 2 years, and 15.4% have just started using it this year.

TABLE 4.6 - DEMOGRAPHIC STATISTICS BY INTERNET EXPERIENCE

Internet Experience	Frequency	Percent
Less than 1 year	96	15.4
1-2 years	154	24.7
3-5 years	208	33.3
More than 5 years	166	26.6

Finally, table 4.7 shows the mobile Internet usage frequency of the respondents. It shows that the majority of the respondents, 40.5%, were frequent users with many uses per day, 37.7% were daily users, 9.3% are using mobile internet around 2 – 5 times a week, 3.4% and 3.7% were using it once per week and once per month respectively, while 5.4% have never used it before.

TABLE 4.7 - DEMOGRAPHIC STATISTICS BY INTERNET USAGE FREQUENCY

Usage Frequency	Frequency	Percent
Never	34	5.4
Once a Month	23	3.7
Once a Week	21	3.4
2-3 Times a Week	32	5.1
4-5 Times a Week	26	4.2
Daily	235	37.7
Many Times per Day	253	40.5

5 Analysis of the Data

After collecting the response data using the methods described earlier, it is time to do the analysis, covered in this chapter. The present thesis uses a multistep and method approach in the analysis of the data. Each of the steps is thoroughly explained below, although most of the actual results are presented in detail later in Findings. The steps and methods detailed below include factor, regression and cluster analysis, cross-tabulation of data and finally, reliability and validity assessment.

5.1 Factor Analysis

As the first step, factor analysis was applied to the questionnaire data, but actually even before that, some data was already processed as a part of the pre-analysis reliability and validity assessments. For example, some items were deleted because of the issues with data consistency. Also, the fitness of the data specific to factor analysis needed to be assessed. According to Jokivuori and Hietala (2007, 113), there are two indicators for this. The so-called Kaiser-Meyer-Olkin (KMO) test of sampling adequacy should be at least 0.5 (Malhotra & Birks 2007, 648) and the Bartlett's test of sphericity should be significant. Since the KMO of the current data was 0.842 with Bartlett's test significant at $p< 0.00$, it is safe to conclude that the data (after reliability and validity processing) has excellent fit for factor analysis.

In a nutshell, factor analysis looks at the correlations between initial scale items and comes up with n artificial factors that the items seem to best belong to (Jokivuori & Hietala 2007, 89). Ideally each item would correlate or load only one factor but in reality, items tend to, at best, have a noticeable loading in one factor and some residual cross-loading on other factors. To maximize the difference between high and low loadings and to minimize cross-loadings, the initial result from the factor analysis was rotated around the origin. The rotation does not affect the number of factors, but the item loadings on each factor so that the results would be easier to interpret (Malhotra & Birks 2007, 656).

The main reason to run a factor analysis is to reduce the number of the constructs (Jokivuori & Hietala 2007, 90; Malhotra & Birks 2007, 646), effectively removing some of the complexity of the model that has been criticized in the past (Bagozzi 2007; Raaij & Schepers 2008, for example). Indeed, initially a total of eight different constructs were identified and included in the theoretical framework. They were: performance expectancy, effort expectancy, facilitating conditions, social influences, perceived value, perceived playfulness, attention focus, and behavioral intention. In addition, use context was studied as one of the background variables. That theoretical framework was based on literature review. Factor analysis gives an empirical confirmation of the theory, based on the actual data, but it also helps reduce data to a more manageable level (Malhotra & Birks 2007, 646). Especially for the later stages of analysis, the more granular and complex the data is, the more difficult it is to make clear distinctions and conclusions.

For data reduction, there are multiple ways to determine the number of output factors and none of them is the single correct way. In the end, the decision is always a subjective but reasoned combination of all of them (Jokivuori & Hietala 2007, 99). The present thesis employs the three following approaches: eigenvalues, scree plot and the percentage of variance explained (Malhotra & Birks 2007, 654).

Eigenvalue is a measure that shows the relative variance explained associated with a factor compared to the average of a single construct. Hence, a cut-off point of eigenvalue 1.0 is often used. Scree plot is a visual way to display the same "number of factors/ eigenvalue" data, and can indicate an appropriate range of factors to be included. Jokivuori and Hietala (2007, 98) suggest a range where the scree plot is seen to straighten out considerably. The percentage of variance explained approach is a bit different from eigenvalue or scree plotting. Here, an artificial level of acceptable cumulative explanatory power of the model is set beforehand and the number of factors is determined by this cut-off level. Malhotra and Birks (2007, 654) recommend that the level to be set at 60%. However, Jokivuori and Hietala (2007, 98) mention that even 50% of cumulative

variance explained can be considered quite satisfactory. See table 5.1 and figure 5.1 for the data on all three methods.

TABLE 5.1 -EIGENVALUE AND CUMULATIVE PERCENTAGE OF VARIANCE EXPLAINED

Factors	Initial Eigenvalues	
	Total	**Cumulative %**
1	6.943	27.773
2	2.498	37.763
3	2.255	46.782
4	1.716	53.647
5	1.454	59.462
6	1.191	64.224
7	1.131	68.747

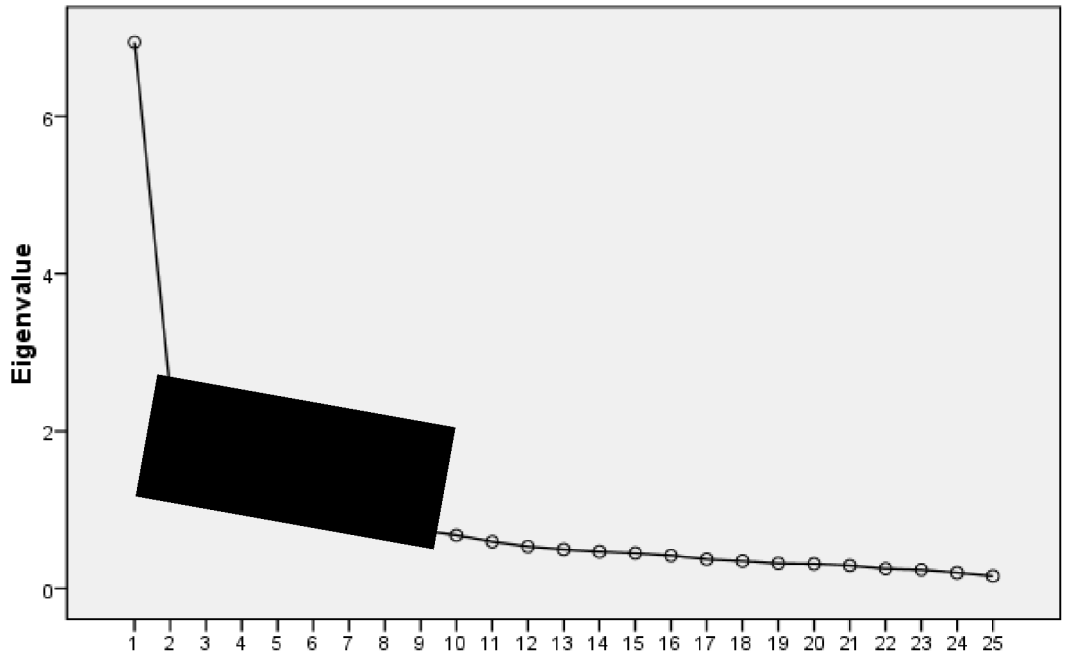

FIGURE 5.1 - SCREE PLOT

Looking at the data, strict eigenvalue approach would yield seven factors at maximum. Furthermore, visual interpretation of the scree plot would suggest anything between two to nine factors. Since initially the number of scale items amounted to eight constructs, the

preference here is less than eight factors. On the low end, according to the scree plot, three factors looks sufficient, but actually they only account for around 50% of the explanatory power. Therefore, keeping the eight factors was chosen, as that number satisfied all three approaches.

5.2 Regression Analysis

The second step into the analysis, regression analysis, is one of the most common ways in statistics to identify relationships between a dependent and independent variables (Jokivuori & Hietala 2007, 40). It can be used to firstly establish the existence of the relationship, secondly to measure the strength of it and thirdly to predict the behavior of the dependent variable through changes in independent variables (Malhotra & Birks 2007, 581).

The majority of the past studies presented earlier have used regression analysis to prove the link between different constructs and, most importantly, to show that the items surveyed leads to acceptance and adoption of the technology in question. However, as pointed out by Jokivuori and Hietala (2007, 40) and Malhotra and Birks (2007, 581), the mere existence of a relationship does not automatically imply causality. The models in research papers often assume different chains of causality, although nothing can confirm or deny the direction of the relationship. Of course, like always, common sense can be applied here, and it is fairly easy to argue that constructs such as perceived playfulness or perceived value could affect mobile Internet adoption, and not the other way around.

Using structural equation modeling, the hypothesized relationships in the proposed research model were tested and analyzed. As seen in table 5.2, the results showed that the $\chi 2$ value of 469.99 (d.f. = 247) with a p-value of .001 indicated a good model fit. In addition, fit indices such as the Normalized Fit Index (NFI = 0.87), Non-Normed Fit Index (NNFI = 0.91), Comparative Fit Index (CFI = 0.93) and Incremental Fit Index (IFI = 0.93) almost all exceeded the suggested level of 0.9, indicating a good model fit. Furthermore, Hair, Anderson, Tatham, & Black (1998) suggested that if the Root Mean

Square Error of Approximation (RMSEA = 0.062) is less than 0.08, this represents a reasonable error of approximation. The Root Mean Square Residual (RMR) in this study was equal to 0.054, which is below 0.08; hence, it is regarded as evidence of good fit (Hair et al, 2006). In summary, the overall results suggested that the research model offered an adequate fit to the data.

TABLE 5.2 - FIT INDICES FOR STRUCTURAL MODEL

Fit indices	Recommended value	Result
Chi-square/degrees freedom (χ^2/df)	<5.00 (Hair et al., 1998)	1.903
Root Mean Square Error of Approximation (RMSEA)	<0.08 (Hair et al., 1998)	0.062
Root Mean Square Residual (RMR)	<0.08 (Hair et al., 2006)	0.060
Normed fit index (NFI)	>0.90 (Hu & Bentler, 1999)	0.87
Non-Normed Fit Index (NNFI)	>0.90(Hair et al., 1998)	0.91
Comparative Fit Index (CFI)	>0.90 (Hu & Bentler, 1999)	0.93
Incremental Fit Index (IFI)	>0.90 (Hu & Bentler, 1999)	0.93

5.3 Model validation

In the validation process of the research model two stages can be distinguished. To test the predictive power of the model, both the structural and the measurement model have to be analyzed (Diamantopoulos et al., 2000). In SmartPLS these are referred to as the inner and outer model. For the outer model, item reliability, convergent validity and discriminant validity will be assessed (Hulland, 1999). For the inner model, path coefficients, path validity and the predictive ability on the dependent constructs in the model will be explored (MacMillan et al., 2005). The sample size of 624 responses satisfies the requirements for using PLS as it exceeds hundred times the number of items for the most complex construct (Barclay et al., 1995; Chin, 1998; Gefen et al., 2000) as well as ten times the maximum number of independent variables pointing to any latent variable (Chin, 1998).

5.4 Scale reliability

To assess the reliability of the model different measures needed to be calculated considering the fact that both formative and reflective measures were used. Factor loadings of reflective constructs should exceed a threshold value of 0.5. That way, half of the variance of an indicator can be explained through the construct (Johnson et al., 2006). For the reflective constructs the item loadings provided in table 5.3 indicate a high degree of item reliability since the reflective measures are significantly above the lower bound. Performance Expectancy [Min: 0.828; Max: 0.856], Effort Expectancy [0.729; 0.840], Facilitating Conditions [0.743; 0.761], Social Influences [0.888; 0.912], Perceived Value [0.723; 0.801], Perceived Playfulness [0.886; 0.915], Attention Focus [0.689; 0.898], and Behavioral Intention [0.675; 0.928] all satisfy the minimum restrictions indicated by Hulland (1999).

The average variance extracted (AVE) describes the variance shared between a construct and its measures, as opposed to the composite reliability, which is used to evaluate the internal consistency of a concept. The minimum value for the AVE has been argued to be a 0.5 cut-off point (Fornell & Larcker, 1981). Regarding the composite reliability larger values than 0.7 are desirable (Chin, 1998; Hair, 2006). Concerning the composite reliability of the constructs all results are significant as shown in table 5.3.

5.5 Convergent validity

Convergent validity measures the degree of correlation between the indicators dedicated to one construct. As already alluded to, this restricts the application of this measure to the reflective constructs in the model. There are two measures used to evaluate convergent validity: Cronbach's α and internal consistency measure. Generally, the value for Cronbach's α should be higher than 0.7. Due to its mathematical formulation Cronbach's α tends to be higher the larger the number of indicators used in the construct is. Therefore, any conclusions should also take into account composite reliability outputs which are not biased in this regard.

Next to the restrictions imposed by the threshold value of the composite reliability, all reflective constructs in the research model also exceed the lower bound of 0.7 for Cronbach's α except for facilitating condition which has an edge value of 0.70 as shown in table 5.3.

TABLE 5.3 - LOADINGS AND CROSS-LOADINGS (HIGHEST LOADINGS IN BOLD)

	AF	BI	EE	FC	PE	PP	PV	SI
AF1	**0.8981**	0.2528	0.1387	0.168	0.2415	0.3445	0.0316	0.2233
AF2	**0.8483**	0.1807	0.0534	0.0387	0.1044	0.1484	-0.0999	0.1576
AF3	**0.6895**	0.0612	0.0521	0.0307	-0.0273	0.1086	-0.0539	0.1554
BI1	0.2387	**0.7580**	0.3323	0.3362	0.314	0.3666	0.0409	0.2003
BI2	0.198	**0.8854**	0.2786	0.3117	0.4683	0.4459	0.1728	0.3445
BI3	0.1891	**0.9284**	0.3408	0.3674	0.5025	0.4753	0.1665	0.3193
EE1	0.0515	0.248	**0.7298**	0.398	0.211	0.2826	-0.0753	0.1572
EE2	0.0981	0.2827	**0.8435**	0.5185	0.3207	0.3123	0.0192	0.2404
EE3	0.1363	0.339	**0.8369**	0.5589	0.4079	0.3768	-0.0113	0.2381
EE4	0.0726	0.3083	**0.8406**	0.5453	0.2841	0.3571	0.062	0.2155
FC1	0.1718	0.3178	0.4247	**0.7611**	0.3258	0.3007	0.1364	0.1782
FC2	0.0162	0.3066	0.5626	**0.7806**	0.2462	0.3112	-0.0402	0.1256
FC3	0.052	0.1509	0.2991	**0.5610**	0.1748	0.3019	0.1386	0.2806
FC4	0.0949	0.3032	0.472	**0.7435**	0.305	0.3525	0.1088	0.1459
PE1	0.1512	0.5067	0.3321	0.3383	**0.8564**	0.3831	0.1193	0.2867
PE2	0.2048	0.3804	0.3716	0.3308	**0.8517**	0.4405	0.1257	0.233
PE3	0.1156	0.3727	0.2665	0.2798	**0.8289**	0.3672	0.1201	0.1959
PP1	0.2245	0.4185	0.3611	0.3662	0.4022	**0.8866**	0.1443	0.1825
PP2	0.2499	0.4774	0.4149	0.4508	0.4628	**0.9303**	0.1871	0.2369
PP3	0.3021	0.4729	0.3482	0.3661	0.4101	**0.9151**	0.1176	0.2171
PV1	-0.0111	0.0119	-0.0496	0.0618	0.0759	0.1052	**0.723**	0.0965
PV2	-0.0657	0.1699	0.0104	0.1245	0.1572	0.1623	**0.9412**	0.1336
PV3	0.0384	0.0937	-0.0071	0.0454	0.0784	0.1203	**0.8017**	0.1922
SI1	0.1894	0.2891	0.2319	0.2066	0.2982	0.1983	0.214	**0.8888**
SI2	0.2123	0.3239	0.2435	0.2074	0.2246	0.2224	0.1021	**0.9125**

5.6 Discriminant validity

Convergent validity testing is complemented by discriminant validity testing in order to ensure that items load highest on the constructs they are intended to measure (Kleijnen et al., 2004). To this end, the cross-factor loadings are examined. Table 5.4 confirms that indeed the items are attributed to the correct constructs and thereby establishes discriminant validity for the study sample. Furthermore, according to Fornell & Larcker (1981) an additional test for discriminant validity pits the square root of the AVE for each construct against the variance between the construct and other constructs in the model (Hulland, 1999). Table 5.4 shows the results and confirms that the square root of the AVE is in fact greater, hence creating further support for the validity of the model and showing good discriminant validity.

TABLE 5.4 - RELIABILITY, CORRELATION COEFFICIENT MATRIX AND SQUARE ROOTS OF AVES

	Composite Reliability	**Cronbach's Alpha**	**AF**	**BI**	**EE**	**FC**	**PE**	**PP**	**PV**	**SI**
AF	0.87	0.71	**0.88**							
BI	0.89	0.82	0.25	**0.86**						
EE	0.89	0.83	0.12	0.37	**0.81**					
FC	0.81	0.70	0.13	0.39	0.63	**0.72**				
PE	0.88	0.80	0.21	0.50	0.38	0.38	**0.85**			
PP	0.94	0.90	0.30	0.50	0.41	0.43	0.47	**0.91**		
PV	0.86	0.82	-0.03*	0.15	0.00*	0.11	0.14	0.16	**0.83**	
SI	0.90	0.77	0.22	0.34	0.26	0.23	0.29	0.23	0.17	**0.90**

Notes:

- AF: Attention focus; BI: Behavioral intention; EE: Effort expectancy; FC: Facilitating conditions; PE: Performance expectancy; PP: Perceived playfulness; PV: Perceived value; SI: Social influence.
- * Insignificant values.
- Diagonal elements are square root of the AVEs and off-diagonal elements are correlations.

5.7 Path Analysis

Path analysis is concerned with estimating the magnitude of the linkages (relationships) between variables and using these estimates to provide information about the underlying causal processes (Asher 1983, p30). It is a technique that has been developed to test such a set of relationships.

These estimates (path coefficients) can be obtained by a number of different procedures, the simplest way of which is to employ ordinary regression techniques. Often path analysis uses the outcome of regression analysis, mainly, R^2 and β values. R^2 is used to calculate the residual path coefficients and βs represent the magnitude of the main path coefficients as will be discussed below.

To obtain estimates of the main path coefficients, simply regresses each endogenous variable on those variables that directly impinge upon it, with the assumption that the residual variable in a structural equation be uncorrelated with the explanatory variables in that equation (Asher 1983; Loehlin 1987).

The residual path coefficients can also be demonstrated by ordinary regression analysis since they have a direct regression interpretation. The general form of a residual path coefficient is $\sqrt{1-R^2}$ where R^2 is commonly referred as the proportion of explained variance. Since the standardized variables have a variance of 1, the general expression $1-R^2$ is simply the proportion of unexplained variance. Therefore, the residual path coefficient is simply the square root of the unexplained variation in the dependent variable in question.

Path analysis is superior to ordinary regression analysis since it allows us to move beyond the estimation of direct effects, the basic output of regression. Rather, path analysis allows one to examine the causal processes underlying the observed relationships and to estimate the relative importance of alternative paths of influence. The model testing

permitted by path analysis further encourages a more explicitly causal approach in the search for explanations of the phenomena under investigation (Asher 1983, p. 36-37).

5.8 Path coefficients

To test the structural – or inner – model the relationships between the different constructs are assessed. Firstly, the path coefficients are estimated as shown in figures 5.2, 5.3, and 5.4. The closer a path value is to the minimum or maximum within the range of -1 to +1 the more pronounced the effect of the relationship is. A path value of close to zero signifies that two constructs do not share a causal relationship. According to Chin (1998) the threshold value for these β coefficients lies at ±0.2 in order to constitute a significant effect.

Figure 5.2 showing no evidence for strong relationships between effort expectancy, attention focus, or perceived value and behavioral intention as their path coefficient value are 0.05, 0.07, and 0.04 respectively.

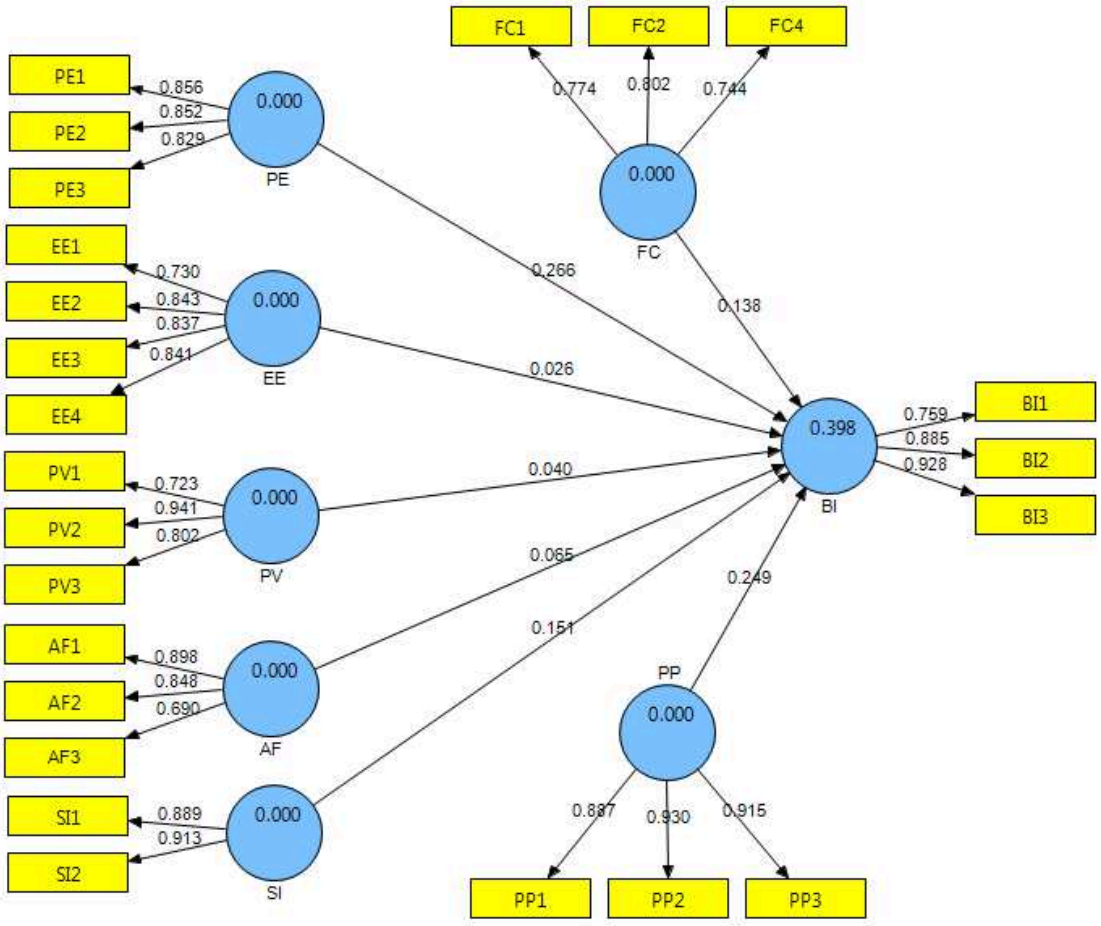

FIGURE 5.2 - REGRESSION ANALYSIS DIAGRAM

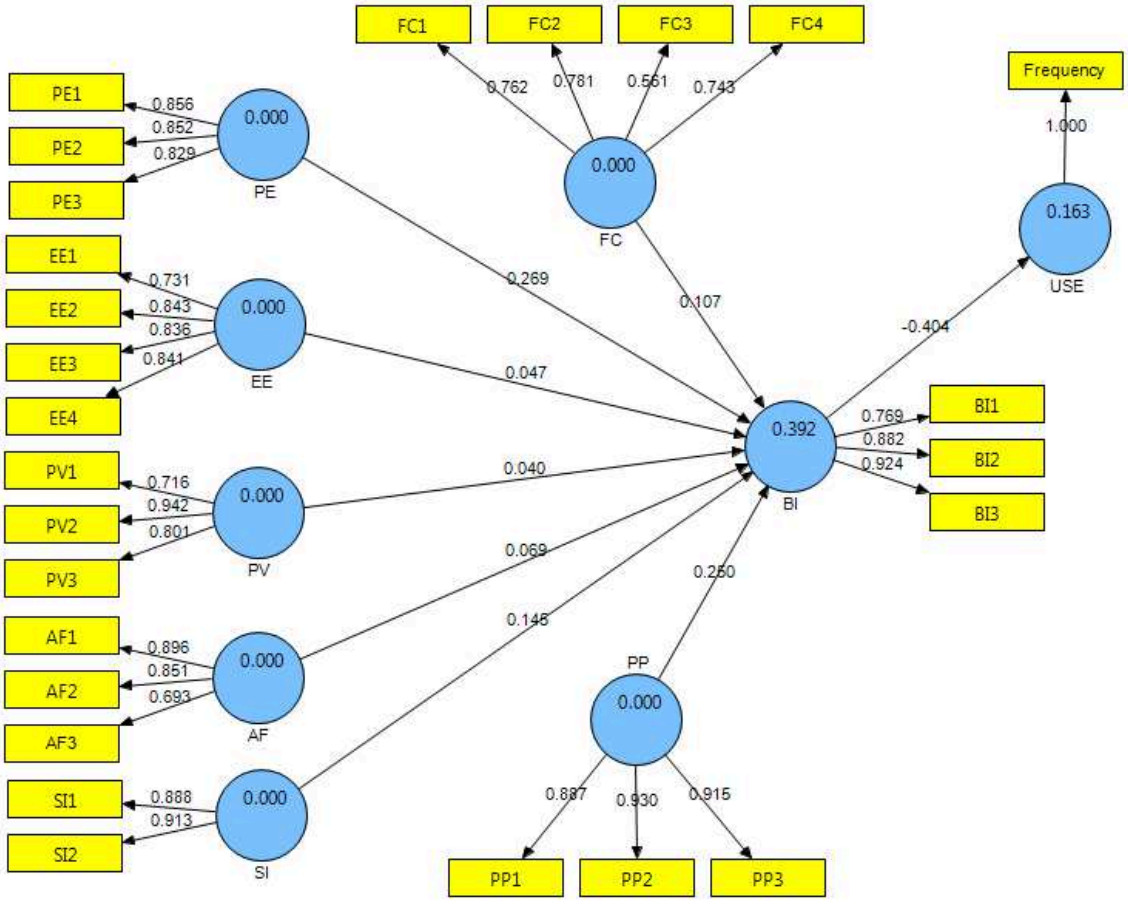

FIGURE 5.3 - PATH COEFFICIENT DIAGRAM

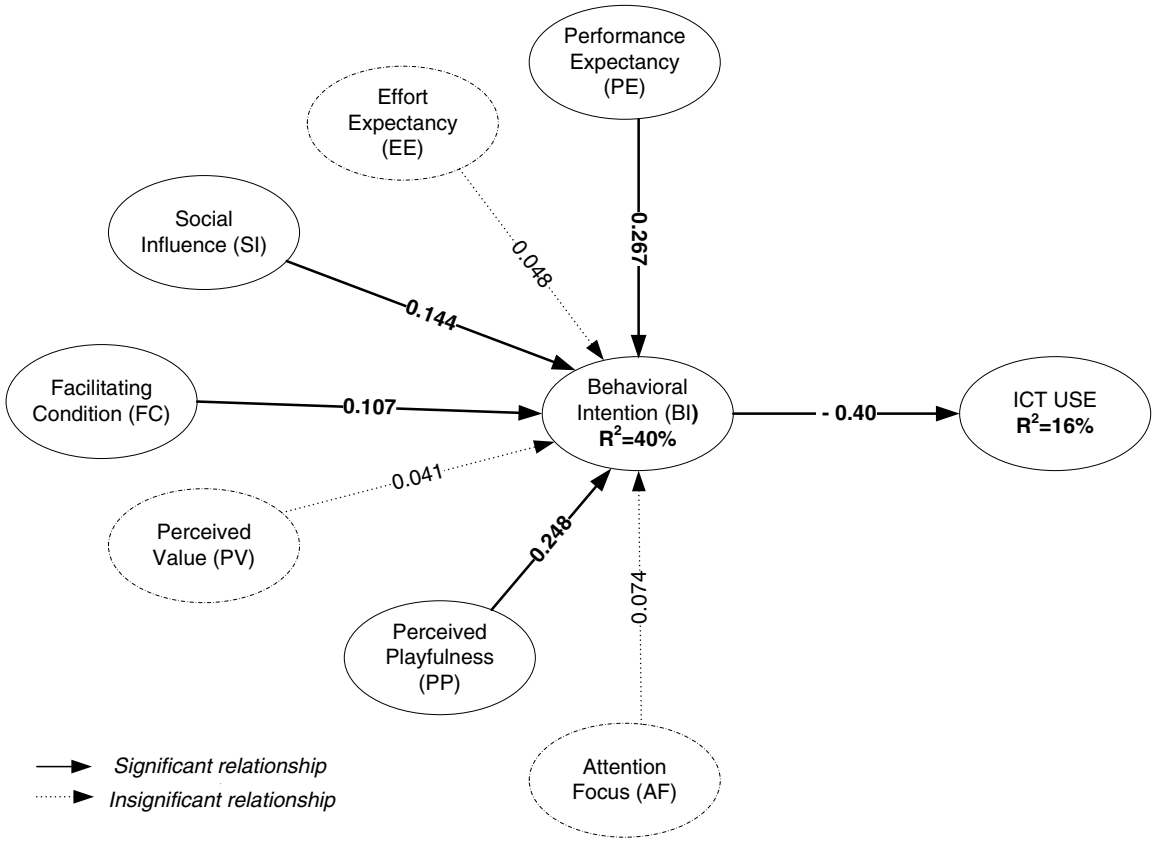

FIGURE 5.4 - PATH COEFFICIENT ANALYSIS OF THE MAIN MODEL

5.9 Path validity

As the path coefficients alone cannot be interpreted conclusively the validity of the β coefficients had to be tested. In order to assure that the found links are in fact significant the p-values of the individual relationships have to be calculated. The bootstrapping resampling method was applied with a 500 sample size since a greater number is generally associated with more reliable results (Nevitt & Hancock, 2001; Tenenhaus et al., 2005).

The bootstrapping algorithm confirms the significance of previously correlated path coefficients as shown in figure 5.5.

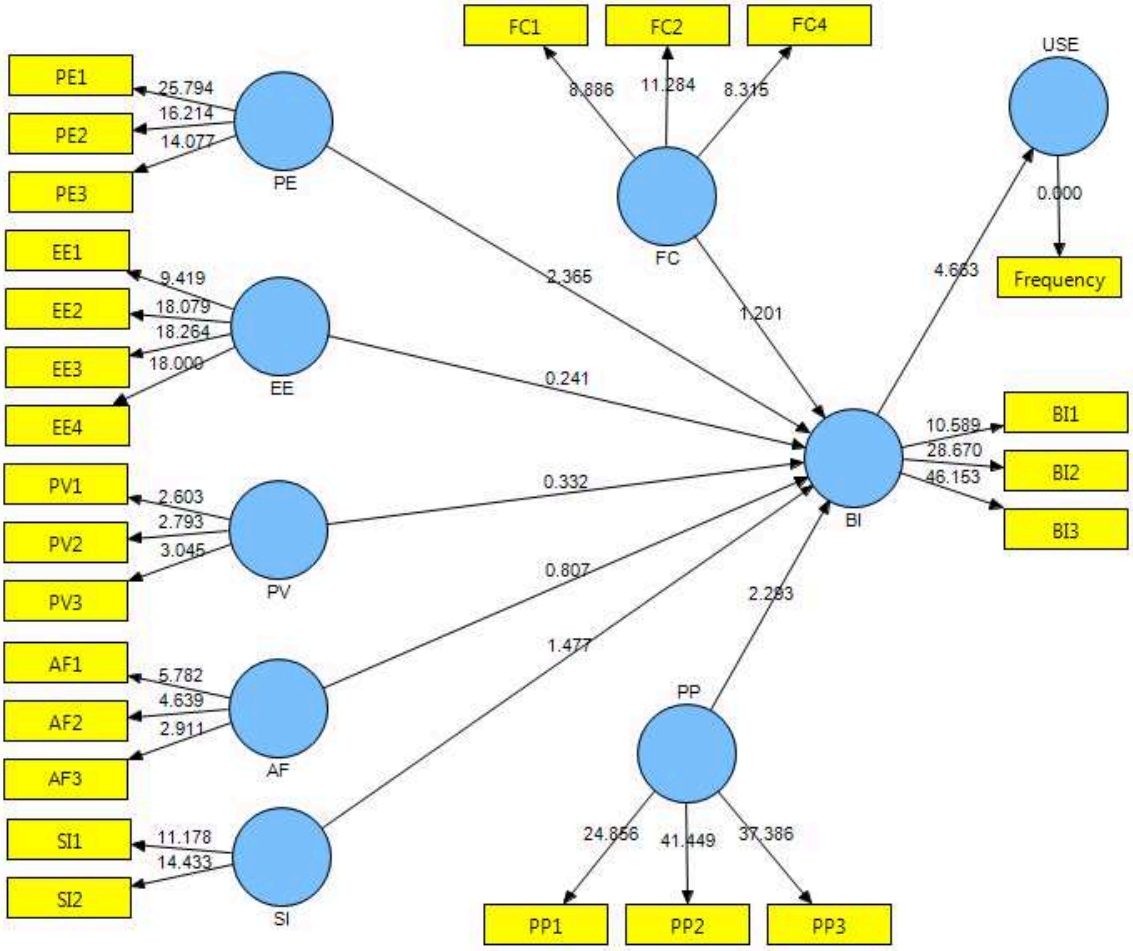

FIGURE 5.5 - BOOTSTRAPPING PATH COEFFICIENTS

5.10 Predictive ability

To test for the proportion of variance explained through this model the predictive ability of the endogenous constructs is evaluated by measuring the coefficient of determination R^2 (MacMillan et al., 2005). As an R^2 value of 1 indicates a perfect model fit in empirical research the threshold value for significant R^2 values is set at a value of 0.1 (O'Cass & Pecotich, 2005). All R^2 values [0.397 for Behavioral Intention and 0.163 for Usage] are above the minimum of 0.1 identified by O'Cass & Pecotich (2005) with supplier integration as well as responsiveness both exceeding Chin's (1998) threshold value.

5.11 Global Goodness of Fit

The goodness of fit of a model describes how well it fits a set of observations. One goodness of fit indicator is the chi-square statistic. However, it is recommended not to use the chi-square as a test statistic but as an indication of fit (Joreskog & Sorbom 1986, Hayduk 1987). The fit is assessed in the sense that large values indicate poor fit, and small values indicate good fit. The degree of freedom serves as the standard by which to judge whether chi-square is large or small. A value of the ratio of a chi-square to the number of degrees of freedom (χ^2/DF) which is less than 5 can be considered adequate for large models (Bollen and Long 1993). Using these test criteria, the value of such a ratio for this model is 1.9 which indicates a very good fit.

Another criterion is the goodness of fit index (GFI) and the adjusted goodness of fit index (AGFI); the closer values are to 1 the better the model fits the data. The values of 0.882 and 0.850 respectively indicate a very good model fit.

A third criterion is the root mean square residual (RMR). This is a measure of the average of the residual variances and covariance. RMR values close to zero indicate a good model fit. The value obtained in this model was 0.060 is indicating a very good fit. For an overall evaluation, the goodness of fit of the model can be said to be extremely good, given the large number of parameters to be estimated.

5.12 Moderating effects

There are two techniques to estimate the moderating effects in structural equation modeling; split-half and cross-product techniques. The A first technique is done by dividing the original sample according to the median of the distribution of the moderating variable (Homburg & Giering, 2001; Sharma et al., 1981) while the later one is by applying the moderating variable as an additional construct using the cross-products of the indicators of the predictor variable and the moderator (Chin et al., 2003). Since the moderating variable (gender, age, and experience) are considered to mainly influence the

behavioral intention-user relationship, the moderating effect of the presence of gender, age, and experience will therefore be tested using cross-products.

5.13 Perceived level of moderating variables

Introducing the level of moderating variable; gender, age, and experience, perceived by the survey respondents in the SmartPLS model requires establishing a direct relationship between the moderating variable and the outcome variable, USE. Due to this, the output when calculating the revised path coefficients and t-test necessary to evaluate the moderating effect also includes the direct effect of the new construct on USE construct. Therefore both, the moderating influence as well as the direct effect will be assessed in order to improve the research model. As shown in figure 5.6, the β coefficients the PLS algorithm revealed significant moderating influences with path coefficients of -0.179. However, bootstrapping results indicated a small t-value and subsequently a significantly greater than 0.05 p-value as shown in figure 5.7. Other model characteristics such as AVE, composite reliability and Cronbach's alpha remained either unaffected or experienced only marginal change. Thus, no moderating effect could be confirmed.

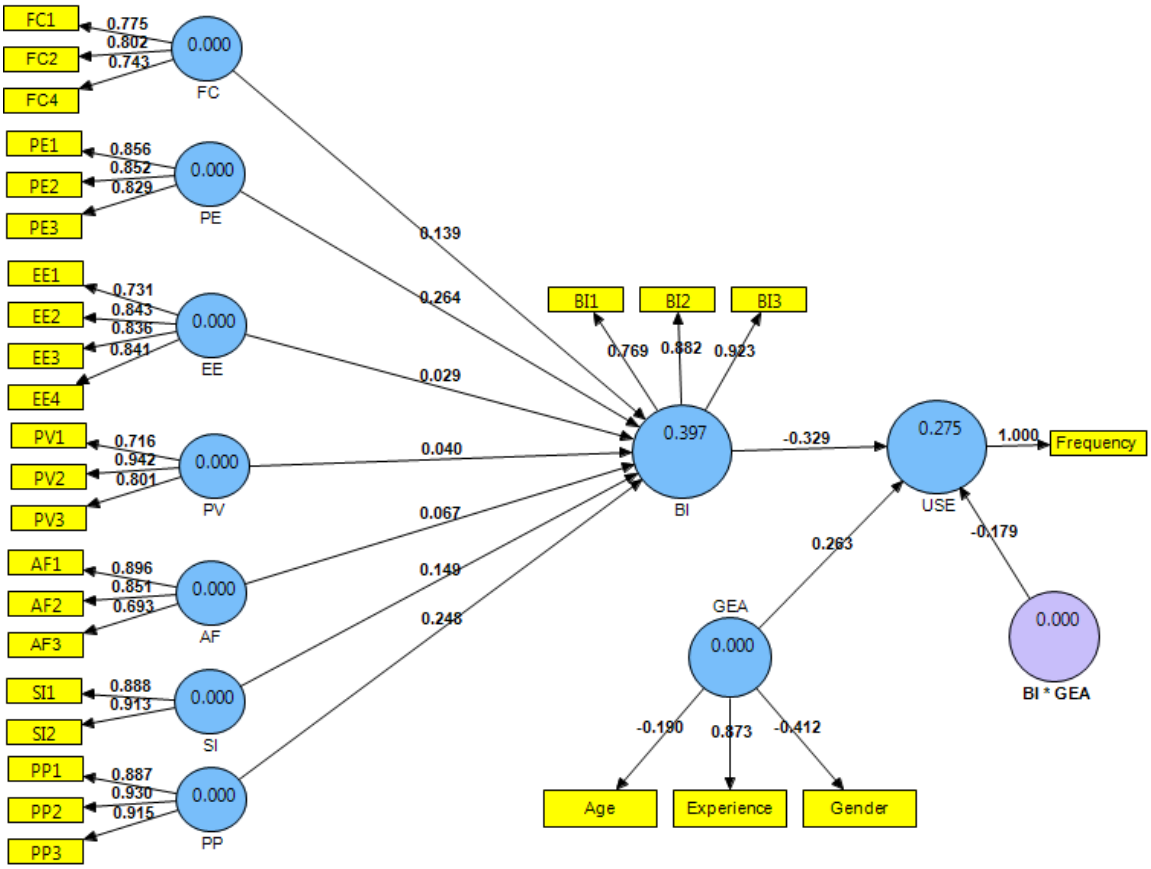

FIGURE 5.6 - MODERATING VARIABLE PATH COEFFICIENTS

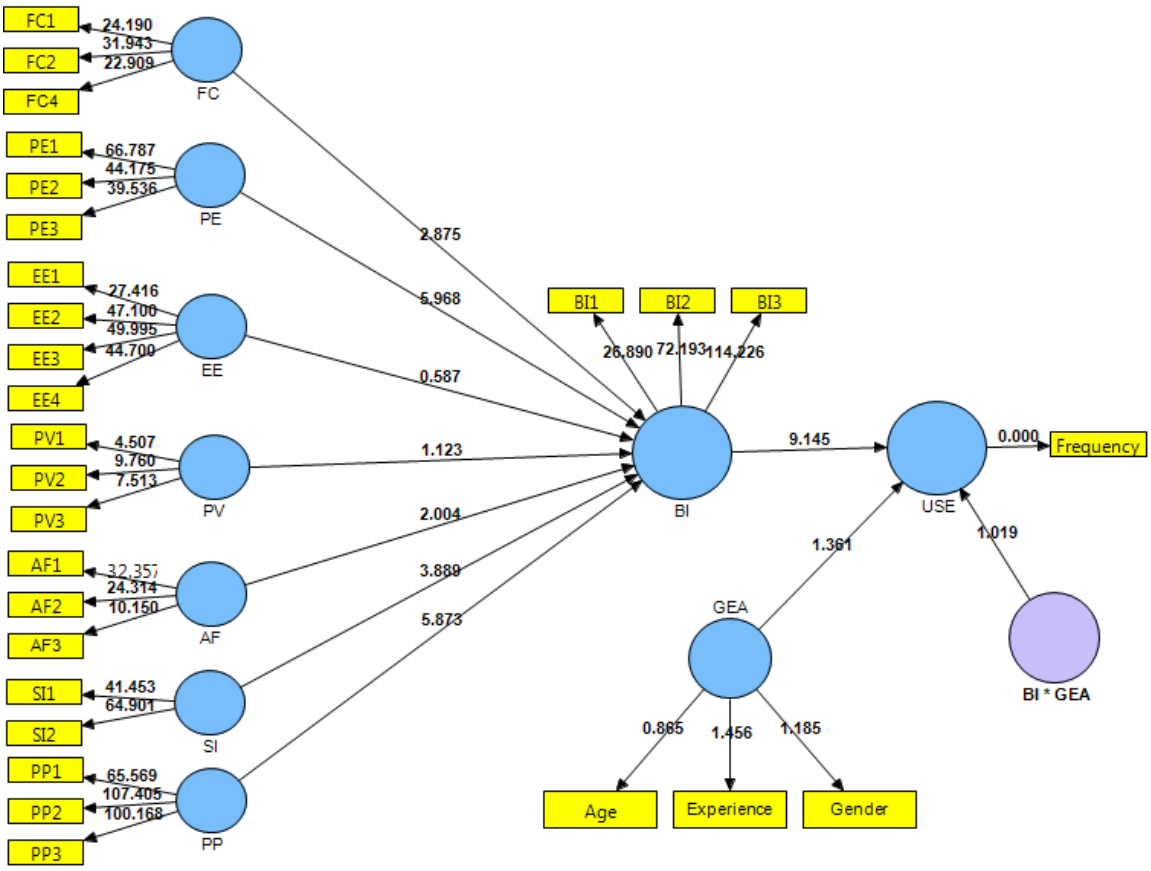

FIGURE 5.7 - MODERATING VARIABLE BOOTSTRAPPING ANALYSIS

6 Synthesis of the Research Findings

This section will summarize, interpret, evaluate, and discuss the findings of section five in relation to the problem presented in chapter one, the hypotheses presented in chapter three, and the theories presented in chapters four.

6.1 Hypotheses testing

To test the hypotheses, a structural model was built using the SmartPLS program. The path coefficients are produced using a bootstrapping procedure. The bootstrapping procedure is essentially a re-sample using the available observations as a basis. The bootstrapping results in a larger sample which is claimed to model the unknown population (Henderson 2005). The new sample provides the data from which conclusions can be drawn. The sample size of 624 observations was increased to 700 re-samples using this bootstrapping method.

Using the results from the model validation in the previous sections, six hypotheses could be confirmed as opposed to two hypotheses that could not be proven based on the data collected. To further illustrate the results, table 6.1 shows path coefficients t-tests, and p-values for each hypothesis.

TABLE 6.1 - HYPOTHESES TESTING

Hypothesis	Relationship	β coefficient	t-test	p-value	Conclusion
H1	Performance Expectancy --› Behavioral Intention	0.264	5.967	< 0.001	**Supported**
H2	Effort Expectancy --› Behavioral Intention	0.029	0.587	> 0.05	Not supported
H3	Social Influence --› Behavioral Intention	0.149	3.888	< 0.001	**Supported**
H4	Facilitating Conditions --› Behavioral Intention	0.139	2.875	< 0.01	**Supported**
H5	Perceived Value --› Behavioral Intention	0.039	1.123	> 0.05	Not supported
H6	Perceived Playfulness --› Behavioral Intention	0.248	5.873	< 0.001	**Supported**
H7	Attention Focus --› Behavioral Intention	0.067	2.004	< 0.05	**Supported**
H8	Behavioral Intention --› Use	-0.328	9.145	< 0.001	**Supported**
H9	Gender, Age, and Experience moderating H8	-0.179	1.018	>0.05	Not supported

The results indicate that out of the behavioral intention constructs developed for ICT use, the performance expectancy has the strongest impact on behavioral intention towards using ICT (β=0.264; p<0.001), and attention focus has the weakest supported impact on behavioral intention towards using ICT (β=0.067; p<0.05), whereas no support for H2 (effort expectancy), H5 (perceived value), or the moderating variables H9 (age, gender, and experience) could be provided.

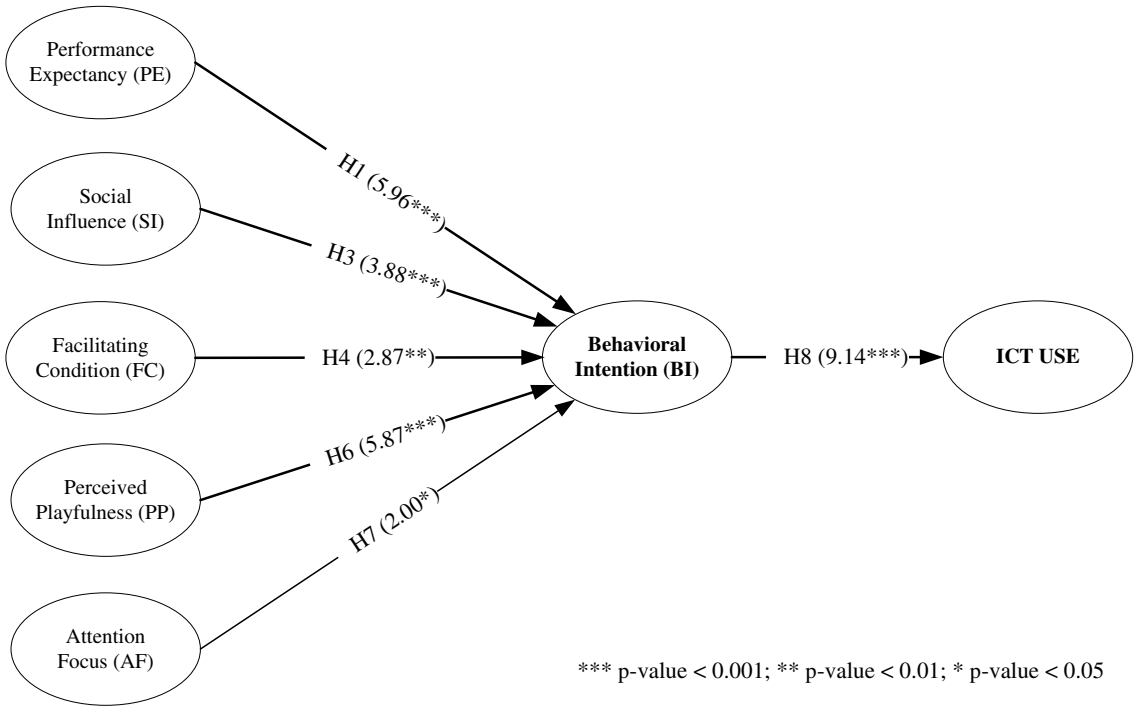

FIGURE 6.1 - SUPPORTED HYPOTHESES LABELED BY THEIR SIGNIFICANCE VALUES

The hypotheses were tested by examining the *βs* in the ordinary regression and path analysis model, the βs in structural model, and their statistical significance. Each hypothesis is restated below and evidence for support or otherwise is then presented. The models depicting significant paths are shown in figure 6.1.

H1: Performance Expectancy will have a significant effect on behavioral intention towards using ICT. There was a very strong support for this hypothesis (β=0.264;

$p<0.001$). The resulting implication is that consumers' expectations of their performance when using mobile Internet play a strong role in determining its acceptance and use.

H2: Effort Expectancy will have a significant effect on behavioral intention towards using ICT. Effort expectancy was expected to impact the intentions to use ICT, however, neither its path coefficient nor its p-value revealed significance of this relationship. Thus this hypothesis is not supported.

H3: Social Influence will have a significant effect on behavioral intention towards using ICT. This hypothesis was supported ($\beta=0.149$; $p<0.001$). Thus when others who are important to a user recommend him or her to use mobile Internet, he or she may follow their suggestions. Hong et al. (2008) also found that social influence has a significant effect on the continuance intention of mobile data services.

H4: Facilitating Conditions will have a significant effect on behavioral intention towards using ICT. There was a very strong support for this hypothesis ($\beta=0.139$; $p<0.01$), which is rationally expected as users who do not own ICT resources and knowledge may not continue their usage of mobile Internet (Zhou, 2011).

H5: Perceived Value will have a significant effect on behavioral intention towards using ICT. This hypothesis was found insignificant due to the small value of β (0.039) as well as the high value of p-value (>0.05). Thus this hypothesis is not supported.

H6: Perceived Playfulness will have a significant effect on behavioral intention towards using ICT. There was a very strong support for this hypothesis ($\beta=0.284$; $p<0.001$). Consumers expect to acquire enjoyment when they adopt mobile Internet to obtain ubiquitous information and services. Since this expectation was met, users will feel satisfied. Thus perceived enjoyment will positively affect ICT adoption and use.

H7: Attention Focus will have a significant effect on behavioral intention towards using ICT. This hypothesis was supported, although the relationship and the p-value were on the edge (β=0.067; $p<0.05$). Mobile users often perform multiple tasks on movement, such as listening to music and accessing mobile Internet. Thus their attention allocated to mobile Internet may be limited.

H8: Behavioral Intention will have a significant effect on consumers' use of ICT. There was a very strong support for this hypothesis (β=-0.328; $p<0.001$). This complies with the Technology Acceptance Model (TAM) (Davis, 1989; Davis et al., 1989), as TAM posits that a user's adoption of a new information system is determined by that user's intention to use the system, which in turn is determined by the user's beliefs about the system.

H9: Age, Gender, and Experience will mediate the relationship between behavioral intention and the use of ICT. This hypothesis was found insignificant. Although its path coefficient was acceptable, the hypothesis value of p-value (>0.05). Thus this hypothesis is not supported.

6.2 Conclusion and Discussion

As shown in figure 6.1, based on our analysis of the collected data, most of our hypotheses were supported, except H2 (effort expectancy), H5 (perceived value), and the mediating variable (age, gender, and experience). Performance Expectancy (PE) was positively related to consumer behavioral intentions (H1) and in turns towards ICT use (H8). These results corroborate previous research results findings (Thong et al., 2006; Lee et al., 2007a) as a fast and convenient communication tool has successfully attracted mobile Internet users, especially the younger generation. For our sample (mainly students), using mobile Internet might be very easy, thus PE had a direct effect on the behavioral attitude and intention of consumers. Moreover, this result is not surprising, as a previous study on TAM has also found that perceived usefulness mediated the effect of PE (perceived ease of use in TAM) on other factors (Davis, 1989).

Performance expectancy (PE) was not significantly supported in our analyzed data, which might be a natural result from a cultural point of view. Based on the UTAUT, it is thought that individual acceptance of mobile Internet will depend on whether or not the accessibility of mobile Internet is easy and effortless. In addition, prior researchers have shown that constructs associated with effort expectancy will be stronger determinants of personal intention about using IT for women than they are for men (Venkatesh et al., 2003). At the same time, Saudi Arabia is a male-dominant society (Ahmad, 2011) and the overall gender response rates were 85.7% male and 14.3% female respondents, thus, the majority of the respondents were male. Hence, the insignificance of PE is culturally reasonable as well as acceptable.

Social influence was found to be another important predictor of intention to use mobile Internet. This illustrates that consumers' intention is determined by peers' opinions. Once consumers start using and become familiar with mobile Internet, they may begin to persuade their colleagues and friends to adopt it. Thus, mobile Internet service providers can promote this service to potential early adopters who are inclined to have a higher level of personal innovation in IT (Rogers, 2003). In contrast, if influential peers have negative word of mouth (e.g., encountering criticism about security, accessibility, reliability, or coverage problems), then user perceived trust will be moderated through social influence, and found that social influence plays a facilitating role towards intention. This suggests that mobile service providers may use word-of-mouth effect to facilitate user behavior since the number of later mobile Internet adopters are likely to rise rapidly when the number of mobile Internet users reaches a critical mass point (Rogers, 1995).

Venkatesh et al. (2000) found that facilitating condition's effect on behavioral intention is positively correlated with effort expectancy. Facilitating conditions are largely captured within the effort expectancy construct which taps the ease with which that tool can be applied. Moreover, facilitating conditions has also found to be also positively correlated

with social influence and on continuance usage. Our model found the facilitating conditions is significantly mediating the behavioral intentions towards ICT usage. This result is consistent with extant findings (Kuo and Yen, 2009; Kim et al., 2011) which reflect that users have the knowledge and resources necessary to use mobile Internet. Therefore, if there are more conditions that support the use of a technology, then people would be more likely to adopt the technology.

Perceived value has a non-significant influence on adoption intention in the context of mobile Internet in our analyzed sample data, which contradict with the findings of earlier research in economics and marketing (Lee & Overby, 2004; Soltani & Gharbi, 2008) that perceived value can reflect customers' beliefs about adoption intention. In a consumer context, women are likely to pay more attention to the prices of products and services, and will be more cost conscious than men (Slama and Tashchian 1985). Moreover, gender difference induced by social role stereotypes will be amplified with aging (Deaux and Lewis 1984). Hence, gender and age might have negatively moderated this construct in our sample data since most of our respondents were males (85.7 %) and very young (77% less than 29 years old). Moreover, our sample data was collected in Saudi Arabia, the world's largest oil producer, has a per capita GDP that ranks among the highest in the world and the largest and fastest growth of ICT marketplaces in the Arab region (Alghamdi, 2012). Thus, the construct of perceived value and its interactions with the other model moderators are crucial in expanding the scope and generalizability of the model to the consumer environment.

Perceived enjoyment has strong effects on behavioral intentions towards mobile Internet usage. This result is consistent with extant research on the effect of perceived enjoyment on user behavior (Koufaris, 2002; Dickinger et al., 2008). Consumers adopt mobile Internet to not only acquire ubiquitous information and services, but also obtain enjoyment. When this expectation is fulfilled, they will be satisfied and continue their usage.

It is interesting that among the factors affecting behavioral intention towards mobile Internet use, perceived playfulness and effort expectancy have the largest significant effects. Thus mobile service providers need to enhance their interface design and deliver easy-to-use services to users. For example, they can adopt location-based services to present the contextual information and services to users. This may reduce users' effort spent on information search and improve their experience. Service providers also need to provide reliable and uninterrupted services to help users acquire an immersive experience. Otherwise, if users cannot obtain a good experience, they may be unsatisfied, which further affects their continuance usage.

It was expected that attention focus will have a positive effect on the behavioral intention towards mobile Internet use since effort expectancy and perceived playfulness had the highest significant effect as mentioned earlier. Accordingly, flow experience has been viewed as a crucial determinant of online customers' subjective enjoyment of website use (Koufaris, 2002; Lu, Zhou, & Wang, 2009; Wu & Chang, 2005).

Finally, the data analysis has yield the moderated variable (age, gender, and experience) have a non-significant effect on behavioral intentions towards mobile Internet usage. Age, gender, and experience have a joint impact on the link between behavioral intentions and use. Gender differences in task orientation and emphasis on instrumentality will become more pronounced with increasing age (Morris et al. 2005), which was contradicted in our sample date due to the younger age of the majority of the respondents (77% less than 29 years old). Definitely, there is empirical evidence that gender differences in the importance of facilitating conditions become more pronounced with increasing age (Morris et al. 2005; Venkatesh et al. 2003). In concert with age and gender, experience can further moderate the relationship between facilitating conditions and behavioral intention. This is because when consumers have not developed their knowledge and skills, the impacts of age and gender on consumer learning will be more significant than when they have acquired enough knowledge or expertise about the technology. Thus, the non-significance of those variables is a natural result of our

demographic sample distribution in terms of age, gender, and age as 77% of the respondents were below 29 years old, about 86% were males, and the majority (60%) have been using mobile Internet for at least 3 years and more.

7 Conclusions and Future Implications

7.1 Overview of Research

The purpose of this research study was to describe and explain the influence factors on the adoption and use of ICT and to consider the mediating role of the demographic variables of the consumer on their intentions to use such a technology, namely age, gender, and experience. The instruments that were used were recognized, widely-cited instruments for assessing the impact of different factors and constructs on the adoption and use of ICT.

The preceding chapters began with a comprehensive review of the literature on the models and their variables considered for this study: Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and recently, the Unified Theory of Acceptance and Use of Technology (UTAUT). This research focused on the diffusion of the ICT technologies in Saudi Arabia and how cultural norms, values, attitudes, and behaviors influence the use of ICT in Saudi Arabia. In addition, this research discussed the mediating role of the individual characteristics (i.e., different combinations of age, gender, and experience) and how it might influence ICT adoption and use in that region.

The preceding chapters also discussed a way to understand the situation through the development of a conceptual framework and hypotheses. Prior chapters also explained the multi-method research methodology followed in this research study, the analysis and the findings which emerged from the data using well established survey instruments. The researcher concentrated on the most important ICT technology sector in Saudi Arabia, mobile Internet.

Finally, the study discussed the findings from empirical investigations showing the relationship between the proposed construct variables and the adoption and use of ICT.

7.2 The Research Model

The research questions addressed the ongoing research problem. A conceptual model presented in figure 1.1 was designed to show all the possible relations between the dependent and independent variables in this study. Firstly, the direct influence of the seven constructs: Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), Social Influences (SI), Perceived Value (PV), Perceived Playfulness (PP), Attention Focus (AF) on the behavioral intentions towards the use of ICT was assessed. Secondly, the Behavioral Intentions (BI) impact on the use of ICT as well as the moderated variables: Age, Gender, and Experience were assessed. The research has empirically tested the propositions derived from the model. The results obtained largely support the influences hypothesized in the proposed model.

7.3 Research Methodology

A survey method was used to validate the framework empirically and helped to assess the trends, attitudes, culture and its influence on ICT adoption and use. Survey research has long been the dominant method in information systems and IT research for exploration, description, or explanation purposes (Pinsonneault & Kraemer, 1993). Using a combination of well-established survey instruments, 624 usable questionnaires were collected and analyzed using a combination of multiple and logistic regression.

7.4 Summary of the Main Findings

This study analyzed the influence of 8 proposed constructs with moderated variables on the adoption and use of ICT in Saudi Arabia. Performance expectancy (t-value = 5.96) and perceived playfulness (t-value = 5.87) have shown the highest significant impact on the consumers' behavioral intentions towards using the mobile Internet services in Saudi Arabia. Satisfaction affects continuance usage. Numerous studies have uncovered that satisfaction is a main factor determining continuance behavior (Bhattacherjee, 2001; Kuo et al., 2009). Among the factors affecting satisfaction, perceived playfulness has the

largest effect. Thus mobile services providers should deliver an enjoyable experience to enhance user satisfaction.

Surprisingly, both perceived value and effort expectancy have shown a non-significant impact on the consumers' behavioral intentions towards the use of mobile Internet with t-values of 1.12, and 0.58 respectively. Similarly, the moderating variable of individual characteristics (i.e., different combinations of age, gender, and experience) found to be statistically insignificant with a t-value of 1.01. Those insignificant values tend to be a natural result of the respondents' profiles, which might skewed or changed when applying the model in a different geographical region.

Facilitating conditions, social influences, and attention focus were significantly influence the behavioral intentions towards the ICT use with t-values of 2.87, 3.88, and 2.00 respectively. This suggests that mobile service providers may use word-of-mouth effect to facilitate user behavior. Facilitating conditions reflect that users have the knowledge and resources necessary to use mobile Internet. It is quite likely that as facilitating conditions deals with broader infrastructure and support issues, it will always be important to those who value it even if they have significant experience with the target technology

Behavioral intention in the consumer context had a positive and strong direct effect on the use of ICT with a very high t-value of 9.14 and explained variance (R^2) of 28%. Consumers' behavioral intention toward adoption and use of ICT is also be affected by other factors such as the opinions of other important persons (social influence) (Fishbein & Ajzen, 1975). Furthermore, even if users have a strong intention to perform a behavior, they will not be able to do so without the necessary resources and skills (facilitating conditions) (Ajzen, 1991). Hence, previously confirmed effects of other constructs naturalize this result as well.

7.5 Limitations

This section examines limitations of the current study and considers the impact they have on the research conclusions. There are a number of intrinsic limitations related to a research study of this nature. First, in cultural studies, the use of self-reported data is often confused with a number of biases such as social-desirability bias. In some situations, respondents may be tempted to give the socially desirable response rather than describe what they actually think, believe or do (Hebert, Ma, Clemow, Ockene, Saperia, Stanek, Merriam, & Ockene, 1997; Nancarrow & Brace, 2000). A second limitation might be the respondents' profile; they were mainly young people whose behavior might differ somewhat from the population average. They are generally more innovative and faster to accept new technologies, and this may have biased to the results.

A third limitation might be the sampling method employed in this research. It can be claimed that the representative character of the respondents relative to the entire population could be increased (Fowler, 2002; Perry, 1998). Another limitation in this research is perhaps the use of cross-sectional research design in a fast-moving and developing IT field. Cross-sectional designs may be attractive for their advantages of saving on time and cost, however the design strictly limits the researcher's capability to address changing or developmental issues or recommend fundamental interpretations (Esterling et al, 2004; King, 2001). Finally, a further issue relating to the sample such as different technology, educational level, different age group, economic statutes, and different region, may have played a role in each individual respondent's answer. Recognizing these limitations, some of the results should be perhaps regarded as more suggestive than conclusive.

7.6 Implication for Further Research

The implications of this research study are important and significant for telecommunication companies, ICT adopters, practitioners, Internet service providers, vendors, and academics that have an interest in ICT adoption in Saudi Arabia or other

countries of similar cultures in other regions of the world. Acknowledging the scarcity of prior research into the influential factors on adoption and use of ICT, the potential for further research is considerable. An interesting avenue of further research that has not been addressed in the scope of this thesis is to explore the interrelationships between the set of independent variables and the ICT adoption/ use and how they interact in determining how extensively and significantly the ICT adoption/ use process is implemented in different technology sectors and across various regions. This research study could be replicated in different ICT technologies incorporating cloud computing and social media, including other countries, is another avenue for future research. In light of the current thesis, another extension of this work can identify other relevant factors that may help increase the applicability of our model to a wide range of consumer technology use contexts.

This thesis has provided some significant insights into the understanding of the influential factors on the adoption and use of ICT in Saudi Arabia. Furthermore it has provided a solid understanding of how cultural variables influence their adoption process. There are many pieces to the puzzle regarding how these variables are measured and the validity of instruments used that need to be addressed through future research to expand the knowledge of why countries with the same socioeconomic features adopt technology in general and ICT in particular differently.

8 Publications

8.1 Journals

8.1.1 Scopus indexed

Alwahaishi, S. & Snášel, V. (2013). Consumers' Acceptance and Use of Information and Communications Technology: A UTAUT and Flow Based Theoretical Model. A revised final version of this paper will appear in Journal of Technology Management & Innovation, vol. 8, issue 2 **(SJR = 0.137)**

Alwahaishi, S. & Snášel, V. (2013). Modeling the Determinants Influencing the Diffusion of Mobile Internet. A revised final version of this paper will appear in Journal of Physics: CS. **(SJR = 0.25)**

Alwahaishi, S. & Snášel, V. (2013). End User's Adoption of ICT in a Developing Country: An Empirical Study. Procedia Social and Behavioral Sciences (Accepted). **(SJR = 0.162)**

8.1.2 ACM, DBLP and Google Scholar indexed

Alwahaishi, S. & Snášel, V. (2013). Modeling the Determinants Affecting Consumers' Acceptance and Use of Information and Communications Technology. A revised final version of this paper will appear in International Journal of E-Adoption, vol. 5, issue 1.

Alwahaishi, S., Jaffar, A., Vondrák, I., & Snášel, V. (2012). Business Process Models Representation by Deducing Interpretative Evidences on Intuitively Common Symbols. International Journal of Productivity Management and Assessment Technologies, 1(1), 29-39

Ditsa, G., **Alwahaishi, S**., Alkobaisi, S., & Snášel, V. (2011). A Comparative Study of the Effects of Culture on the Deployment of Information Technology. International Journal of Technology Diffusion, 2(4), 12-24

S. Alwahaishi, J. Martinovič, and V. Snášel (2011). Publications' Classification Analysis using Concept Lattices. International Journal on New Computer Architectures and Their Applications 2(1): 312-323

Alwahaishi, S, Snasel, V, & Talet, A. (2010). Website Evaluation an Empirical study of Arabian Gulf Airlines. International Journal of Information Studies, 1(3), 212-222.

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8.2 Book Chapters

Ditsa, G., **Alwahaishi, S**., Al-Kobaisi, S., & Snášel, V. (2013). A Comparative Study of the Effects of Culture on the Deployment of Information Technology. In A. Zolait (Ed.), Technology Diffusion and Adoption: Global Complexity, Global Innovation (pp. 77-90). Hershey, PA: Information Science Reference.

8.3 Conferences

Alwahaishi, S.; Snasel, V. (2012). The Deployment of MIS in Developing Countries. Digital Information Processing and Communications, Second International Conference on. 180-184. (**Scopus,** IEEE Xplore, Google Scholar)

Saleh Alwahaishi, Jan Martinovic, Václav Snášel (2011). Analysis of the DBLP Publication Classification Using Concept Lattices. Digital Enterprise and Information Systems - International Conference, DEIS 2011, 99-108. (**WoS, Scopus [SJR = 0.137],** Google Scholar)

Talet, N., & **Alwahaishi, S**. (2011). The relevance cultural dimensions on the success Adoption and Use of IT. 3rd International Conference on Advanced Management Science. IPEDR vol.19, (EBSCOhost)

Saleh Alwahaishi & Václav Snášel (2010). Assessing the LCC Websites Quality. 2nd International Conference on Networked Digital Technologies. 556-565. (**WoS, Scopus [SJR = 0.137],** IEEE Xplore, Google Scholar)

Alwahaishi, S., Vondrak, I.; Snasel, V.; & Jaffar, A. (2010). Preferences of business process models: Interpretative analysis on spontaneously common symbols. 2nd IEEE International Conference on Computer and Automation Engineering. 204-209 (Scopus, IEEE Xplore)

Alwahaishi S., & Snasel, V. (2010). Assessing the LCC Websites Quality. In F. Zavoral et al (Eds.), Networked Digital Technologies. 556-565, Berlin: Springer Berlin Heidelberg. (**WoS, Scopus**)

Alwahaishi, S., Nehari-Talet, A., & Snasel, V. (2009). Electronic commerce growth in developing countries: Barriers and challenges. 1st International Conference on Networked Digital Technologies, 225-232 (**WoS, Scopus**, IEEE Xplore, Google Scholar)

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Appendix A - Measurement Scales and Items

Performance Expectancy (PE) (adapted from Venkatesh et al. (2003))

PE1: I find mobile Internet useful in my daily life

PE2: Using mobile Internet helps me accomplish things more quickly

PE3: Using mobile Internet improves my living and working efficiency

Effort Expectancy (EE) (adapted from Venkatesh et al. (2003))

EE1: Learning to use mobile Internet is easy for me

EE2: It is easy for me to become skillful using mobile Internet

EE3: My interactions with mobile Internet is clear and understandable

EE4: I find mobile Internet easy to use

Social Influence (SI) (adapted from Venkatesh et al. (2003))

SI1: People who are important to me think that I should use mobile Internet

SI2: People who influence my behavior think that I should use mobile Internet

Facilitating Conditions (FC) (adapted from Venkatesh et al. (2003))

FC1: I have the resources necessary to use mobile Internet

FC2: I have the knowledge necessary to use mobile Internet

FC3: I can get help from others when I have difficulties using mobile Internet

FC4: Mobile Internet is compatible with other technologies I use

Perceived Value (PV) (adapted from Venkatesh et al. (2012))

PV1: Mobile Internet is reasonably priced

PV2: Mobile Internet is a good value for the money

PV3: At the current price, mobile Internet provides a good value

Perceived Playfulness (PP) (adapted from Koufaris (2002))

PP1: Using mobile Internet is fun

PP2: Using mobile Internet is enjoyable

PP3: Using mobile Internet is entertaining

Attention Focus (AF) (adapted from Koufaris (2002))

AF1: When using mobile Internet, I do not realize the time elapsed

AF2: When using mobile Internet, I am not aware of things happening around me

AF3: When using mobile Internet, I often forget the work I must do

Behavioral intention (BI) (adapted from Venkatesh et al. (2003))

BI1: I intend to continue using mobile Internet in the future

BI2: I will always try to use mobile Internet in my daily life

BI3: I plan to continue to use mobile Internet frequently

Appendix B - Survey Questionnaire

Q1 What is your gender?

Male (1)

Female (2)

Q2 What is your age?

Under 20 (1)

20 - 29 (2)

30 - 39 (3)

40 - 49 (4)

50 and above (5)

Q3 What is the highest level of education you have completed?

Less than High School (1)

High School (2)

Some College/ Diploma (3)

Bachelor Degree (4)

Master Degree and Higher (5)

Q4 What is your monthly Income (Saudi Riyals)?

< 1000 (1)

1000 - 4000 (2)

4001 - 8000 (3)

8001 - 14000 (4)

14001 - 20,000 (5)

> 20,000 (6)

Q5 Please indicate your Occupation:

Management, professional, and related (1)

Computer, IT, and Telecommunications (2)

Banking, investment, and Finance (3)

Medical and Health Profession (4)

Construction and maintenance (5)

Oil and Chemical industry (6)

Logistics and Services (7)

Education and Training (8)

Engineering (9)

Business (10)

Government Employee (11)

Private Business (12)

Student (13)

Unemployed/ Retired (14)

Other (15)

Q6 How long have you been using Mobile Internet?

Less than 1 year (1)

1-2 years (2)

3-5 years (3)

More than 5 years (4)

Q7 How frequently do you use Mobile Internet?

Never (1)

Once a Month (2)

Once a Week (3)

2-3 Times a Week (4)

4-5 Times a Week (5)

Daily (6)

Many Times per Day (7)

Q8 I find mobile Internet useful in my daily life

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q9 Using mobile Internet helps me accomplish things more quickly

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q10 Using mobile Internet improves my living and working efficiency

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q11 Learning to use mobile Internet is easy for me

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q12 It is easy for me to become skillful using mobile Internet

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q13 My interactions with mobile Internet is clear and understandable

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q14 I find mobile Internet easy to use

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q15 People who are important to me think that I should use mobile Internet

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q16 People who influence my behavior think that I should use mobile Internet

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q17 I have the resources necessary to use mobile Internet

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q18 I have the knowledge necessary to use mobile Internet

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q19 I can get help from others when I have difficulties using mobile Internet

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q20 Mobile Internet is compatible with other technologies I use

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q21 Mobile Internet is reasonably priced

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q22 Mobile Internet is a good value for the money

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q23 At the current price, mobile Internet provides a good value

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q24 Using mobile Internet is fun

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q25 Using mobile Internet is enjoyable

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q26 Using mobile Internet is entertaining

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q27 When using mobile Internet, I do not realize the time elapsed

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q28 When using mobile Internet, I am not aware of things happening around me

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q29 When using mobile Internet, I often forget the work I must do

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q30 I intend to continue using mobile Internet in the future

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q31 I will always try to use mobile Internet in my daily life

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)

Q32 I plan to continue to use mobile Internet frequently

Strongly Agree (1)

Agree (2)

Neither Agree nor Disagree (3)

Disagree (4)

Strongly Disagree (5)