MOBILE INFORMATION SYSTEMS: AN EMPIRICAL ANALYSIS OF THE DETERMINANTS OF MOBILE COMMERCE ACCEPTANCE IN JORDAN

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Abstrak

Perdagangan mudah alih telah digunakan dan dikaji secara meluas di negara-negara maju, namun penggunaannya di negara-negara Timur Tengah masih di tahap yang rendah. Malah, di Jordan, walaupun kadar penembusan pelanggan telefon mudah alih agak tinggi pada tahun 2009, penyelidikan empirikal berkaitan dengan perdagangan mudah alih ini adalah terhad. Oleh itu, penyelidikan kuantitatif ini bertujuan untuk mengkaji secara empirikal tentang penentu kepada penerimaan perdagangan mudah alih dalam budaya kelompok yang terdapat di Jordan di mana norma-norma sosial adalah dihargai sementara tindakan individunya dipengaruhi oleh kumpulan rujukan yang dominan. Model Penerimaan Teknologi (TAM) telah diperluaskan dengan mengambilkira empat faktor iaitu (keadaan/suasana yang membantu, kos, inovasi peribadi dalam teknologi maklumat (PIIT) dan norma subjektif). Untuk memahami norma subjektif dalam budaya kelompok ini, ianya telah dipecahkan kepada beberapa tahap yang berbeza iaitu injuksi peribadi dan masyarakat dan norma deskriptif. Rangka kerja kajian ini terdiri daripada dua belas pemboleh ubah pendam (lapan eksogen dan lima endogen). Pengumpulan data dilakukan melalui penggunaan kajiselidik-kendiri yang mengandungi 40 item berskala Likert 7-mata. Daripada 500 sampel, 448 maklumbalas (89.6%) berjaya dikumpulkan dan hanya 401 boleh digunakan. Pemodelan persamaan berstruktur telah digunakan untuk menganalisis data. Hasil kajian ini menunjukkan bahawa keadaan/suasana yang membantu, kos, PIIT, sikap dan tanggapan kegunaan adalah penentu penting ke atas niat tingkah laku di Jordan. Di samping itu, norma subjektif, keadaan/suasana yang membantu, kos dan tanggapan kegunaan adalah anteseden yang signifikan ke atas sikap yang akhirnya akan mempengaruhi niat tingkah laku. Selain itu, bukti empirikal juga menunjukkan bahawa norma peribadi injunksi, norma deskriptif peribadi dan norma injunksi kemasyarakatan adalah anteseden bagi norma-norma subjektif. Sebagai kesimpulannya, kajian ini membuktikan bahawa TAM lanjutan berjaya memperkayakan model dan meningkatkan kuasa penerokaan kepada 53% dalam menerangkan varian niat tingkah laku.

Kata Kunci: Niat perlakuan, M-dagang, Norma Subjektif

Abstract

Although mobile commerce have been used and widely researched in developed nations, there is a low usage in the Arab world. Also, there is a limited empirical research on mobile commerce in Jordan despite the high penetration of mobile phone subscribers in 2009. Among the aims of this quantitative research is to empirically investigate the determinants of mobile commerce adoption in a collectivist culture such as Jordan where social norms are valued and individual actions are influenced greatly by important reference groups. The Technology Acceptance Model (TAM) is extended to include four factors (facilitating conditions, cost, personal innovativeness in IT (PIIT) and subjective norms). Furthermore, in order to understand subjective norms in collectivist culture; subjective norms were decomposed into different levels (personal and societal injunctive and descriptive norms). The research framework consists of twelve latent variables (seven exogenous and five endogenous). Using self-administered survey, 40 items with 7-point Likert scale is used to collect data. Out of the 500 samples, 448 responses (89.6 % response rate) were collected; eventually 401 responses were usable. Structural Equation Modeling is applied to analyze the data. The findings of this study revealed that facilitating conditions, cost, PIIT, attitude and perceived usefulness are significant determinants of behavioral intention in Jordan. In addition, subjective norms, facilitating conditions, cost and perceived ease of use are significant antecedents of attitude which in turn influencing behavioral intention. Moreover, the empirical evidence indicated that personal injunctive norm, personal descriptive norm and societal injunctive norm are indeed antecedents of subjective norms. It can be concluded that extended TAM successfully enriched the model and increased the exploratory power to 53 % in explaining behavioral intention variance.

Keywords: Behavioral intention, M-commerce, Subjective norms

Publications Related To This Research

1. Ghassan Alnajjar, M. Mahmuddin, T. Ramayah (2011). Adoption Factors of M-commerce in Jordan: From Personal and Societal Norms Perspectives. 3rd IEEE International Conference on Information management and engineering-IEEE ICIME 2011, Zhengzhou, China, May 21-22, 2011, Pages 52-55.

2. Ghassan Alnajjar, M. Mahmuddin, T. Ramayah. A Conceptual Model of Mobile Commerce Acceptance in Collectivist Cultures. International Conference on Innovation, Management and Technology Research, Malacca, Malaysia, May 21-22, 2012 .

3. Ghassan Alnajjar, M. Mahmuddin, T. Ramayah, Ahmad Najjar (2012). Determinants of M-commerce Acceptance in Jordan: An Empirical Analysis. International Journal of Mobile Communications (Under Review).

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List of Abbreviations

AT	Attitude
AVE	Average Variance Extracted
BDT	Behavioral Decision Theory
BI	Behavioral Intention
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
DTPB	Decomposed Theory of Planned Behavior
DV	Dependent Variable
EFA	Explanatory Factor Analysis
FC	Facilitating Conditions
GFI	Goodness of Fit Index
GSM	Global System for Mobile Communications
ICT	Information and Communication Technology
IDT	Innovation Diffusion Theory
IFI	Incremental Fit Index
IS	Information System
IT	Information Technology
ITU	International Telecommunication Union
IV	Independent Variable
MIS	Management Information Systems
PCLOSE	Closeness of Fit
PDN	Personal Descriptive Norm
PEOU	Perceived Ease of Use
PIIT	Personal Innovativeness in IT
PIN	Personal Injunctive Norm
PU	Perceived Usefulness
RMSEA	Root Mean Square Error of Approximation
SDN	Societal Descriptive Norm
SEM	Structural Equation Modeling
SIN	Societal Injunctive Norm
SN	Subjective Norms
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model 2
TAM3	Technology Acceptance Model 3
TLI	Tucker Lewis Index
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology
VIF	Variance Inflation Factor

CHAPTER ONE
INTRODUCTION

This chapter covers the main topics in this research; it begins with a brief background of m-commerce, motivations of the study, the research problem statement, questions, objectives, scope, significance of the research, research limitations and research contributions. It concludes with an overview of the content of this thesis.

1.1 Background

Nowadays, mobile phone users have the capability to conduct transactions, services, access information and buy goods anytime and anywhere. The rapid growths of mobile telecommunication and mobile-internet have made mobile commerce (hereafter referred to m-commerce) popular with businesses as well with individuals. M-commerce refers to direct or indirect transactions over wireless telecommunication by using mobile devices such as mobile phones or personal digital assistants (Wu & Wang, 2005).

Others have defined mobile business as new "experiences of social interaction" with the utilize of wireless and mobile telecommunication technologies (Mylonopoulos, Doukidis, & Editors, 2003). With the sharp growth of the mobile phone subscribers

and the availability of mobile services (such as mobile-payment, mobile-banking, mobile-health, mobile-games, short messaging services (SMS), multimedia messaging services (MMS) and mobile-web), consumers can access information and communicate virtually with a high level of convenience and mobility.

The number of mobile phone subscribers worldwide had reached 4.60 billion in 2009 (International Telecommunication Union, ITU, 2010a). In addition, ITU (2010a) stated that "Growth in mobile telephony continues to be strongest in the developing world" (p.1). Mobile payment users, for instance, were 81.3 million users worldwide in 2009 (Portioresearch, 2010). In a recent report by ITU (2011), worldwide mobile phone subscriptions increased to 5.3 billion at the end of 2010, which represented 78% of global population as shown in Figure 1.1. The trends of the two technologies of mobile telecommunication and the wireless internet have prepared m-commerce to become popular in some countries such as Japan with revenue exceeding $10 billion in 2009 (Robles, 2010) . Moreover, according to the same source, m-commerce revenue worldwide will grow to be $119 billion by 2015.

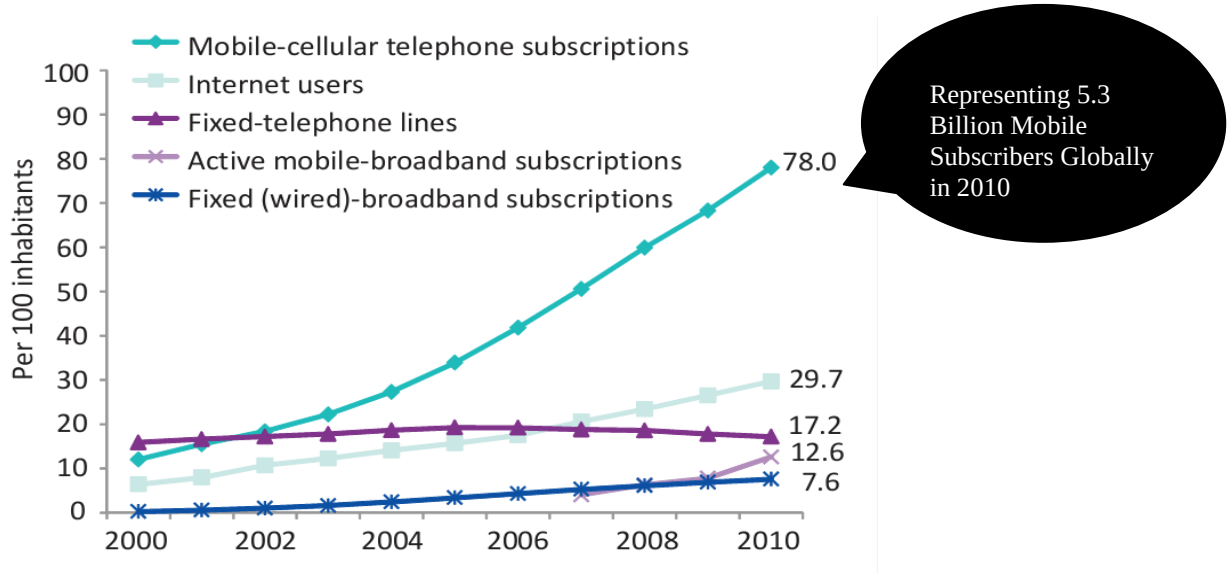

Figure 1.1: World Wide Mobile Subscriptions in 2010
Source : Modified from ITU (2011), ITU (2010b)

Theoretically, m-commerce gains more benefits over e-commerce as consumers can access m-commerce services 24-hours without the restriction of a physical terminal or time. Practically, despite the benefits of m-commerce; however, acceptance rate of m-commerce is still undersized in spite of its availability and the increasing number of mobile phone subscribers. Although m-commerce services provide many advantages to mobile phone users, it falls short of the high expectations (Khalifa & Shen, 2008b; Ondrus, Lyytinen, & Pigneur, 2009; Verkasalo, López-Nicolás, Molina-Castillo, & Bouwman, 2010). In simple terms, affordability and availability of mobile phones will not automatically guide to predict the adoption rate of m-commerce. Rather, mobile phones and internet connections through the mobile phones should be seen as a prerequisite for m-commerce (Anckar & D'Incau, 2002).

Moreover, enhancing functionality and building a great level of m-commerce services require an in-depth understanding of the end-users perceptions and their behavioral intentions (Dai & Palvia, 2009). In fact, one of the most challenging research issues in Information Systems (IS) and Information Technology (IT) is to understand why individuals accept or reject a new technology (Davis, Bagozzi, & Warshaw, 1989; Venkatesh, Morris, Davis, & Davis, 2003). Therefore, the future of m-commerce relies on customers' adoption rate and the investigation of the factors that influencing the adoption (Yang, 2005).

The purpose of this study is to investigate the antecedents that influencing the adoption of m-commerce (behavioral intention) in Jordan. M-commerce adoption literature revealed that the majority of the research was conducted in developed nations (Dai & Palvia, 2009). Furthermore, unwilling to use m-commerce by mobile phone users is a common issue in developed and developing nations alike; however, there are limited empirical studies related to the m-commerce in the Arab world. Consequently, in the case of developing nations (such as Arab countries and Jordan in particular), little research is available for identifying the significant determinants of deploying m-commerce or predicting m-commerce adoption factors (Manochehri & AlHinai, 2008).

1.2 Mobile Information Systems

The advancement in mobile computing and telecommunication technology have lately led to the expansion of interest in mobile information systems. The development of mobile technology has allowed the prospective of information systems to access information and collaboration beyond the traditional places and normal boundaries such as the office (Er & Kay, 2005). Mobile information system is defined as "Information systems that include end-user terminals that are easily movable in space, are operable independent of location and have wireless access to information resources and services" (Krogstie, 2009, p. 3908).

Other researchers described mobile information systems as "systems involving: mobile devices, users, wireless and mobile networks, mobile applications, databases and middleware" (Varshney, 2003, p. 155). Moreover, the advancement in any of the above areas will influence mobile information systems.

The usages of various mobile devices such as mobile phones have been increased dramatically every year. This caused the rise of mobile applications include mobile financial services (banking, brokerage, mobile money transfer, and mobile payments), mobile advertising (user/location sensitive), proactive service management, location based services, mobile auction, mobile entertainment services, and wireless data center applications (Varshney, 2003).

The use of mobile systems and mobile applications in any business is an extension of electronic business (e-business) and electronic commerce (e-commerce). This extension from e-commerce to mobile phones has led to the m-commerce services and business around the world.

1.3 Overview of M-commerce

M-commerce is a new area of research (Ngai & Gunasekaran, 2007). In the beginning of 2000, m-commerce was born during the dot-com boom (Goi, 2008). Users in mobile services can access the internet, maps, news, sports, weather forecasts, send and receive emails, conduct banking transactions and make payments, or trade stocks, shop for goods, book tickets, download music, etc. (AlHinai, Kurnia, & Johnston, 2007).

According to Wang and Lei (2007) wireless networks are the backbone of m-commerce actions. Nowadays, wireless networks have the capability of transmitting voice and data formats such as pictures and video as well as text. As indicated by Wang and Lei (2007), over time the wireless networks have gone through phases:

1. **1st Generation (1G).** First generation (1G) began in 1980s with analogue mobile systems (FDMA) with clear severe mobile limitations.

2. **2nd Generation (2G).** The next wave was the digital mobile systems-Second Generation (2G) that began in the late of 1980s which allowed the transfer of data with non-voice services.

3. **Generation (2.5G).** An advancement of the 2G networks was referred to as 2.5G wireless networks such as high-speed circuit-switched data, EDGE (Enhanced Data Rates for Global Evolution) and GPRS (General Packet Radio Service).

4. **3rd Generation (3G).** Today, the Third Generation (3G) is the most popular mobile technology. Beginning in the early 2000s, 3G allows the transfers of many services including: voice, video, multimedia and data. CDMA2000 and Universal Mobile Telecommunications System (UMTS) also known as Wideband CDMA (WCDMA) is among the leading mobile technologies in 3G (Bannister, Mather, & Coope, 2004). The "always on" feature and the higher bandwidth are the two most features that differentiate 2.5G and 3G devices from 2G technologies.

5. **4th Generation (4G).** The Fourth Generation (4G) with ultra high-speed access is currently the most advanced mobile technology that has the capacity to transfer data and multimedia with a high speed of 100 megabits per second.

In general, it seems that wireless networks experienced rapid improvement despite the technological limitations of wireless technologies such as low bandwidth and

transaction execution delays (Barnes & Huff, 2003). The purpose of mobile companies is to generate revenues by offering consumers services that he/she needs. Therefore, despite the mobile technology utilized, the consumer's adoption of m-commerce is important. After all, it is the consumer specific factors that will support consumer demand for m-commerce. As a result, it is evident that focusing on the end-users, their preferences, and what factors drive potential users to accept and utilize the services are key to the success of m-commerce.

1.3.1 M-commerce Definitions

M-commerce is a new trend, there is no single or universal definition of m-commerce; however, the literature presents different definitions of m-commerce. Tiwari and Buse (2007) defined m-commerce as "any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device" (p.33). According to Mohd and Osman (2005), m-commerce is buying and selling of goods and services through wireless handheld devices such as mobile phones and personal digital assistant (PDAs). Laudon and Laudon (2004) defined m-commerce as "the use of wireless devices, such as cell phones or handheld digital information appliances, to conduct both business-to-consumer and business-to-business e-commerce transactions over the internet" (p.118). Charbaji, Rebeiz, and Sidani (2009); Yang (2005); and Yaseen and Zayed (2010) stated that m-

commerce is as an extension of electronic commerce and that is the most common definition among researchers. However, other researchers suggested that m-commerce is not an extension of e-commerce because it is different and m-commerce has its own infrastructure, equipment, and application (Manochehri & AlHinai, 2008).

Based on all definitions, this study focused on the individual's perspective and follows the definition of Charbaji, Rebeiz and Sidani (2009), which suggested that m-commerce is an extension of the classical of e-commerce. In addition, Feng, Hoegler and Stucky (2006) stated that "m-commerce as the extension of electronic commerce from wired to wireless computers and telecommunications and from fixed locations to anytime, anywhere, and anyone device" (p.41).

1.3.2 M-commerce Characteristics

According to Turban, King, Lee, and Viehland (2004) m-commerce can be classified as a subset of e-commerce. The main characteristics of m-commerce is ubiquity which allows the customer to interact with a mobile application anytime anywhere, without being connected to wires (AlHinai, et al., 2007), unlike e-commerce where the connection needs a fixed line network in a physical location (Wei, Marthandan, Chong, Ooi, & Arumugam, 2009). The other characteristic of m-commerce is localization, which is the ability of an application to propose a service

specific to the physical location of the user. Moreover, personalization is a characteristic of m-commerce in which the ability to adapt m-commerce activity according to a user profile. Furthermore, the characteristics of m-commerce that are listed above (ubiquity, localization, and personalization) and the end-users profile of the potential m-commerce users as a paid mobile services subscriber present the ground on which to distinguish between m-commerce and e-commerce (Petrova, 2008).

1.3.3 Difference between M-commerce and E-commerce

Zhang, Yuan and Archer (2002) suggested the differences between e-commerce and m-commerce are the origin, technology and nature of the services as shown in Table 1.1. The authors argued that:

1. Origin: The development of e-commerce was caused by the rapid growth of the Internet. The Internet initiated from several programs such as Computer Science Network (CSNET), Advanced Research Projects Agency Network (ARPANET), and National Science Foundation Network (NSFNET) sponsored by the U.S. government projects which intended to provide a networked computing for researchers. The Internet was extended in the early 1990s to business community and e-commerce was born. E-commerce bridges the distance and allows the business community to present and sell products and services economically to consumers and businesses

around the world due to nearly free internet access. In contrast, m-commerce is a paid services and consumers pay for airtime and roaming. Cost cannot be ignored in m-commerce; therefore, studying cost is an important factor for adopting m-commerce.

2. Technology: Transmission Control Protocol/Internet Protocol (TCP/IP) is the primary Internet infrastructure of e-commerce. With time, the World Wide Web (WWW) has dominated the Internet traffic and the majority of e-commerce applications have become web-based. On the contrary, the access of m-commerce technologies can be accomplished through different wireless networks standards ranging from global (Satellite), regional (3G, IEEE 802.11a/b, DoCoMo I-mode), to short distance (Bluetooth). Mobile carriers use various systems and standards such as Time Division Multiple Access (TDMA), Frequency Division Multiple Access (FDMA), Code Division Multiple Access (CDMA) and GSM.

3. Services: The Internet allows e-commerce services and applications to be globally available. The web enables rich information, simple and complex electronic transaction with strong backend enterprise information systems. On the other hand, m-commerce applications rely on private wireless carriers. M-commerce services are generally delivered to a specific area, simple transactions, more personalized, location-specific and time-critical. The Internet based e-commerce classified into business to consumer (B2C) and business to business (B2B). Quite the opposite, m-commerce classified into person to person (P2P) and person to system (P2S) which

fits more appropriate to deal with the nature and development of m-commerce applications.

In summary, there are few factors worthy to be highlighted. Cost is important to access and use m-commerce. Another very important factor is the social interaction. Mobile phones have increased the social connection between people due the nature of services such as P2P. Therefore, it is important to realize that in order to better understand m-commerce behavioral intention factors; researchers should focus on the nature of the services such as social interaction which could lead to an increased adoption rate.

Table 1.1: Difference between E-commerce and M-commerce

	E-commerce	**M-commerce**
Origin		
Sponsorship	Government-sponsored Internet	Private mobile phone industry
Business entry cost	Low	High
Customer access cost	Free or low cost Internet access	High mobile service charge
Customer base	Highly educated computer users	Less educated cell phone customers
Technology		
Message transmission	Packet-switched data transmission	Circuit switched for streamlined voice communication
Protocol	TCP/IP, HTTPML	GSM, TDMA, CDMA, 3G
Standardization	Highly standardized	Multiple incompatible standards
Connectivity	Global	Mainly regional
Bandwidth	High	Low
Identity	URL with IP and domain name	Phone number
Application development	General computer applications	Device-specific applications
Interface device	Personal computers	Cell phones and PDAs
Mobility	Fixed location	Mobile

Display	Big screen	Small screen
Main input mode	Keyboard for full text input	Voice with small key pad
Main output mode	Text and graphics	Voice with small text display
Local processing power	Powerful CPU with large memory and disk space	Limited processing power with small memory chip
Software and Programming	Support a variety of programming languages	Java or specific script languages
Trend	Towards sophistication	Towards minimization
Services		
Service range	Global	Regional
Delivery destination	PC in office connected to the Internet	Person accompanied by a mobile device
Transaction complexity	Complete and complex transactions	Simple transactions
Information provided	Rich information	Simple and short messages
Timing	Less time-critical	Time critical
Location-based service	No	Yes
Target mobility	Service to a fixed point	Service to a moving target
Backend business connection	Strong connection to backend business information systems	Weak connection to backend business information systems
Service classification	B2C (business to consumer) and B2B (business to business)	P2P (person to person) and P2S (person to system)

Source: Adapted from Zhang, Yuan and Archer (2002), p.88

1.4 Overview of Mobile Telecommunication in Jordan

Jordan similar to any other developing nation is witnessing a transformation movement towards mobile phone communication technologies. Remarkably, it seems that researchers have generally overlooked this transformation movement in the Arab world. After investigation of the academic journals, the researcher found very few empirical studies that are related to m-commerce in the Arab world and in Jordan. One possible explanation is that m-commerce is a relatively new research area in Jordan and in the region.

In term of achievements, mobile telecommunication and wireless internet are experiencing a rapid growth in Jordan. For instance, mobile broadband Worldwide interoperability for Microwave Access (WiMAX) technology was introduced in Jordan in 2008 (Diab, 2011). Another example, mobile phone communication technologies such as Third Generation (3G) was launched in Jordan in 2010 by Orange-Jordan (Diab, 2011).

Regardless of the rapid expansion of mobile telecommunication and wireless internet, m-commerce is not popular in Jordan, and Jordanians are still lacking the adoption of m-commerce (Stafford & Khasawneh, 2009). M-commerce in Jordan facing many challenges as follows:

1. Culture: studies found that m-commerce infrastructure is similar in all countries where the difference raised in the cultural profile (Hosni, Ali, & Ashrafi, 2010). According to Khasawneh (2009), Arab culture prefers the traditional way of personal communication. Therefore, many people are less-confident in the Information Communication Technologies (ICT) due to their limited abilities. This is due to the "lack of resources and insufficient training for advanced technology" (Hosni, et al., 2010, p. 787). Some researchers have argued that "cultural and social norms" in the Arab world can extensively influence the transference of ICTs (Hill, Loch, Straub, & El-Sheshai, 1998; Straub, Loch, & Hill, 2003).
2. Digital (knowledge) divide: in the Khasawneh (2009) study associated with mobile internet in Jordan. The researcher found that lack of understanding, lack of

product knowledge and lack of resources were among the greatest reasons for non-adoption of m-internet in Jordan. Inadequate knowledge of the advantages and the benefits of m-commerce might contribute to the lack of confidence in the capabilities of m-commerce.

3. Pricing: price is critical to the success of m-commerce. Connection fees, roaming fees, access fees, airtime cost and lack of knowledge about the pricing plans are among the reasons for rejecting the technology (Gunasekaran & McGaughey, 2009).

4. Legislation: although Jordan has made progress towards liberalizing and enhancing their laws in the ICT and telecommunication sectors, Jordan needs further development regarding regulations on e-commerce, e-signatures, e-payment and m-business.

1.5 Social Norms Describing Technology Behavior in Arab Countries

According to Rouibah and Ould-Ali (2009), studies showed that culture is playing a significant role in ICT acceptance in the Arab world. Arab culture is a collectivist culture and highly social (Al-Khasawneh, 2010; Hofstede 2009; Loch, Straub, & Kamel, 2003). Social norms score higher in collectivist cultures and these social norms can play a major role in adopting or rejecting a new technology (Ramayah, Rouibah, Gopi, & Rangel, 2009).

For example, Straub et al. (2003) conducted a study of five Arab countries (Jordan, Egypt, Saudi Arabia, Lebanon, and Sudan) regarding the transfer of the IT in the Arab world. They argued that the Arab culture is one of the most complex cultural and social systems in the world. The researchers concluded that Arab cultural beliefs were a very strong predictor and played a major role in IT transfer to the Arab world.

Loch et al. (2003), conducted a study on the diffusing of the internet in the Arab world. They showed that both subjective norms and the degree of "technological culturation" explained 47 % of the variance of their model. They concluded that the Arab culture is reflected as a salience in subjective norms that impact the usage.

Al-Gahtani, Hubona, & Wang (2007), conducted a study of IT acceptance in Saudi Arabia. Collecting data from 722 knowledge workers, they applied the unified theory of acceptance and use of technology to assess the diffusion of IT in the country. The researchers found that Arab culture (social influence) affected the adoption of IT.

Rouibah, Abbas and Rouibah (2011) conducted a study about the adoption of the camera mobile phone in Kuwait by using technology acceptance model II (TAM2). The researchers found that the subjective norms in the Arab culture are affected individual decisions toward adopting camera mobile phone.

Based on the above mentioned studies, subjective norms role in technology acceptance in the Arab world cannot be ignored due to the high social norms in the Arab society. In the Arab world, people live in societies where family and friendship

remain important and have influential aspects in the functioning of institutions and groups (Rouibah, et al., 2011). Furthermore, Arab culture is also influenced by the strong tribes' structure of relationships, strong communities and strong society in large (Loch, et al., 2003). Therefore, several salient referent groups can form and influence the subjective norms in the Arab culture due to the strong relationships on many levels.

As mentioned earlier, collectivist culture is demonstrated by social actions that transfer into the individuals social lives through the creation of social norms (Loch, et al., 2003). Moreover, when subjective norms and attitudes toward technology were better understood, then the new technology could be accepted to the behavior of the adopting individuals.

In addition, social norms are high in collectivist cultures and these social norms can play a significant role in adopting or rejecting a new technology (Ramayah, et al., 2009; Rouibah, et al., 2011). Therefore, the central issue in this research is the importance of subjective norm and the role of subjective norms in collectivist cultures such as Jordan. M-commerce adoption rates vary in different cultures. However, predicting individuals' intention to adopt m-commerce in a collectivist culture, low individualism and high uncertainty avoidance (such as in Jordan) in contrast to western societies (developed countries) is worth investigating and is still an open issue (Grandón, Nasco, & Mykytyn Jr, 2011).

1.6 Motivations of the Study

Although the m-commerce acceptance literature revealed that numerous studies were conducted in developed countries and some Eastern Asian countries, there is a lack of research in the Arab world including Jordan concerning m-commerce acceptance. As far as the researcher knowledge, very few studies address m-commerce acceptance in the Arab countries including Jordan. Filling the gap in the academic literature is one of the motivations for conducting this research in Jordan with a different culture and different social norms.

In addition, broadly speaking, there is a high contradiction between the penetration rate of mobile phones and the lack of the adoption rate of m-commerce in Jordan. In 2009, Jordan reached 101 % penetration of mobile subscribers. On the other hand, the low rate of m-commerce acceptance is noticeable in the country. In other terms, the affordability, and the availability of mobile phones do not automatically guide us to predict the adoption rate of m-commerce in Jordan.

Yet another reason is the Arab world and the growth of ICT in the region, recent reports have shown a stellar upsurge in the internet users with 600% increases from 2002 to 2007, which is the largest in the world (Dutta & Mia, 2009), also a remarkable growth in mobile penetration as well in the region, which motivated researchers to study the factors that influencing users and potential adopters for ICT technologies in the Arab world.

1.7 Problem Statement

Subjective norms have been recognized by numerous studies in the technology acceptance field (Ajzen, 1991; Fishbein & Ajzen, 1975; Taylor & Todd, 1995b; Venkatesh, et al., 2003). However, according to Eckhardt, Laumer and Weitzel (2009, p. 11), "Technology adoption research has long struggled to incorporate normative beliefs from sources in the social environment of adopters into adoption models". In addition, Srite, and Karahanna (2006) stated that "Social norms need to be conceptualized in a more distinguishing manner to capture the nuances of the social environment" (p.697).

Previous researches have frequently used subjective norm to capture the fundamental nature of social influence (Lee, Lee, & Lee, 2006). Moreover, the same authors concluded that social pressure in technology acceptance field has been widely recognized but requires further investigation. In the existing m-commerce research field, Verkasalo et al. (2010) stated in the study on smart-phone applications that "We have to conclude that the role of social norms requires further examination" (p.252).

Overall, decomposing subjective norms (antecedents) is reasonably under-researched in the technology adoption literature (with exceptions to, Bhattacherjee, 2000; Ramayah, et al., 2009; Taylor & Todd, 1995b). In the Arab world, several salient referent groups can shape and influence the subjective norms in the Arab culture due to the strong relationships on many levels "Due to divergence of opinions within the

referent group, the decomposing of subjective norm is very essential (Ramayah, et al., 2009, p. 1225). Therefore, further examination is required.

In addition, the TAM model is usually applied in a work-related context, which does not imply personal innovativeness in IT. Since m-commerce is used by individuals and not shared among people; TAM does not address individuals who are enthusiastic information seekers. Innovative individuals are able to manage the high levels of risk and uncertainty and build up a more favorable attitude toward innovation (Rogers, 1983). Furthermore, facilitating conditions are not considered in TAM. In fact, Davis assumed that everyone is in control of the resources regarding adopting a new system.

Moreover, cost is one of the obstacles in adopting m-commerce. According to Wei et al. (2009) high cost can decrease the acceptance rate of m-commerce. M-commerce services involve fees (connections fees, subscription fees or roaming fees). TAM does not explain cost factor, because TAM was applied mostly in an organizational context that does not involve cost by the end-users in workplace.

Although academic research of m-commerce adoption in the Arab world is limited, there is little attempt to fill the gap in understanding the antecedents of behavioral intention. In addition, as mentioned earlier, the role of subjective norms in technology acceptance within collectivist cultures (such as Jordan) is still an open issue. In order to address this gap, this research extended the technology acceptance model (TAM) and contributed in decomposing subjective norms (SN) into four

norms: personal injunctive norm (PIN), personal descriptive norm (PDN), societal injunctive norm (SIN) and societal descriptive norm (SDN). Furthermore, the extended proposed model integrated a set of the most important factors that have been identified in m-commerce literature that are considered to be the most applicable to the m-commerce adoption. These constructs include: perceived cost, resources facilitating condition and personal innovativeness in information technology (PIIT). Consequently, it is imperative that the problem be approached comprehensively.

1.8 Research Questions

The key research questions for this thesis can be stated as follows:

General Question:

1. What are the critical determinants that influence the individual's behavioral intention to adopt m-commerce in Jordan?

Specific Questions:

2. What is the impact of subjective norm on attitude, perceived ease of use and perceived usefulness to m-commerce adoption in Jordan?

3. How distinctive personal descriptive and injunctive norms and societal descriptive and injunctive norms can explain subjective norms toward behavioral intention?

4. How can TAM (underpinning theory) used to explain behavioral intention of m-commerce adoption decision in Jordan?

1.9 Research Objectives

This research aims to address the following objectives:

1. To investigate the critical determinants affecting the individual adoption decision to adopt m-commerce in Jordan.

2. To investigate closely how much of attitude perception, perceived ease of use perception and perceived usefulness perception can be explained by subjective norms in the context of collectivist culture such as Jordan.

3. To investigate whether decomposed subjective norms factors are significantly influencing subjective norms. Moreover, to distinguish between the antecedents of subjective norms (personal and societal norms levels) with the respect to the impact on m-commerce behavioral intention among Jordanians in the context of collectivist culture.

4. To evaluate and validate the applicability of the underpinning theory (TAM) in order to explain m-commerce behavioral intention. In addition, to evaluate whether the augmented technology acceptance model can present a better predictive power for the behavioral intention to use m-commerce.

1.10 Scope and Limitations of the Study

The scope of this research is confined to Jordan only. This study focuses on behavioral intention towards m-commerce adoption. In order to identify the influence factors, this research extended TAM model with decomposing subjective norms and integrated a set of most applicable variables in m-commerce domain. This empirical research has four limitations. First, this study is measuring the "behavioral intention" not the "actual usage" therefore, use behavior is not measured (omitted). The reason for this is not all of the participants are users of m-commerce. The omission has empirically proven in many previous studies in the technology acceptance field (Davis, 1989; Davis, et al., 1989; Taylor & Todd, 1995b). Second, the constraint of time (cross-sectional) and the research is limited in scope as it consists only to the number of universities (public and private) in Amman (capital) and Irbid (second city) in Jordan. Third, research is confined to university students in Jordan only. The university students have been subject to many studies (Bhatti, 2007; Davis, et al., 1989; Liu & Li, 2011; Lu, Yao, & Yu, 2005; Nysveen, Pedersen, & Thorbjørnsen, 2005b; Taylor & Todd, 1995b) due to the adopting technology faster than other

groups in the society, higher educational level and income potential (Yang, 2005). In addition, "The younger generation use their mobile phones more frequently than older generation" (Sohn & Kim, 2008, p. 1070). Fourth, m-commerce is in a dynamic change, since the m-commerce is relatively new technology in mobile information systems research in Jordan. Generalizing implications should be careful due to the determinants that might change over time.

1.11 Significance of the Study

The results of this study can provide practitioners and researchers with some insights on users' level of adoption behavioral intention regarding users and non-users of m-commerce.

Another reason for the significance of the work is the focus on the Arab world. M-commerce has not been addressed substantially as a research area and very little research exist about how behavioral intention formed to use technologies like m-commerce in the region. The Arab world is unknown for researchers; this work will contribute to the Arab behavior in the adoption of m-commerce research in the region (Rouibah & Abbas, 2006). Moreover, this study will add to the body of knowledge for the future development of ICT and m-commerce research in the Arab countries.

1.12 Organization of the Thesis

The thesis contains six chapters as follows:

Chapter one: presented the brief introduction of m-commerce, problem statement, research questions, objectives, significance of the study and overall structure of six chapters in this thesis. The structure of this thesis is shown in Figure 1.2.

Chapter two: presents the literature review on technology acceptance theories and critical review of the existing related studies.

Chapter three: presents the research theoretical framework, research model and hypotheses of this study.

Chapter four: presents the research methodology including the research design, research instrument, sampling, data gathering, and data analysis. Structural Equation Modeling (SEM) analyses are discussed in the chapter.

Chapter five: presents the data analysis of the study. Findings, reliability, validity and hypotheses testing are presented in this chapter.

Chapter six: presents the discussion of the results including the research objectives, contributions, implications, suggestions, future research and conclusion are discussed.

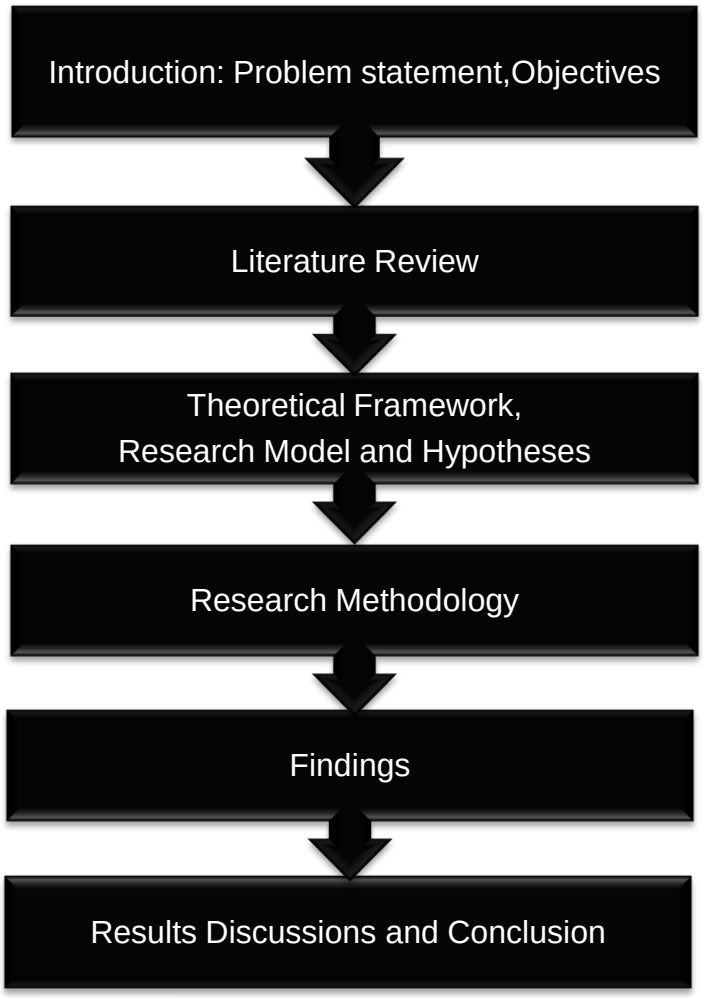

Figure 1.2: Structure of the Thesis

CHAPTER TWO
LITERATURE REVIEW

The objective of this chapter is to develop a clear understanding of the m-commerce and the key determinants that effect the m-commerce adoption by critically reviewing the existing literature (studies) of m-commerce adoption and behavioral intention field. This chapter begins with an overview of the targeted country (Jordan) with brief information about ICT and m-commerce in the country. Next, it provides an overview of IT/IS acceptance research and general perspectives of behavioral intention theories/models were discussed. Then, it reviews the most important theories and models in the technology adoption field and the limitations in order to identify the most suitable theoretical framework for this study. Finally, it critically reviews the related studies and factors influencing m-commerce.

2.1 Jordan: A General Overview

The targeted research country is Jordan. Jordan is a developing nation, located in the Middle East between Iraq, Saudi Arabia, Syria and Palestine as shown in Figure 2.1. Jordan has a population of 6.5 million (CIA, 2011). The country is young, with 35.3 % of the Jordanian population under age of 15, 59.9 % of the people in Jordan are between the age of 15-64 and 4.8 % over the age of 65 (CIA, 2011). Due to the high numbers of young people in the country this study focus on the universities students

in two major cities, Amman city- is the capital of Jordan (population is 2 million) and Irbid city- is the second metropolitan city in Jordan (Kanaan, 2009).

A majority 98 % of Jordan citizens are Jordanian Arab with 2 % being minorities. The Arabic language is the official language of Jordan with common English as a second language in the government, schools, universities and commerce. A majority of people are Muslim 92 % with 6% Christian (Kanaan, 2009).

According to CIA (2011), Jordan's economy is one of the smallest in the region; poor in terms of natural resources and water supply. The World Bank classified Jordan as a middle-income country (Al-Jaghoub & Westrup, 2003; U.S., 2010). However, Jordan has no shortage in technology and telecommunication services are relatively well developed and in a rapid expansion (Abu-Samaha & Mansi, 2007).

Despite Jordan being poor in natural resources, the country has focused on developing its educational systems and investing in young peoples' education. Therefore, the literacy rate in Jordan is over 90 % of the population and is one of the highest in the Middle East. Jordan's professionals are among the best in the region with elevated skills and education, which made Jordan rich in educated human resources (Al-Jaghoub & Westrup, 2003).

Figure 2.1: Map of Jordan
Source : Atlastours.net (2008)

2.1.1 ICT in Jordan

Information communication technology (ICT) is the convergence of "micro electronics, computing and telecommunications, which has become a global phenomenon of great importance and concern in all spheres of human endeavour, spanning across education, governance, business, market share, labour, productivity, culture, trade, commerce and others" (Mofleh, 2008, p. 2). Other authors defined ICT as the technology of software, internet connection infrastructures, computers and telecommunications to carry out information processing and communication functions (Al-Jaghoub & Westrup, 2003). There is no doubt that the role of ICT

would improve the quality of life in Jordan as well as the economy. Jordan was inspired by King Abdullah II of Jordan to move forward to achieve an information society level or as called (e-society).

Therefore, Jordan started ICT e-initiatives (e-Government, e-Learning, e-Health) in 2000 by enhancing their laws and creating the Ministry of Communication and Information Technology (MoICT) facilitating the new movement (Mofleh, 2008). Consequently, Al-Jaghoub and Westrup (2003) acknowledged that Jordan has made progress far above most of the Arab states.

According to ITP.net (2008), in the world economic forum report – the ICT readiness index in Jordan showed "the most marked improvement with a massive eleven step rise to 47th place" (p.1). In a recent report, by world economic forum under the theme "Mobility in a Networked World" by Dutta and Mia (2009), Jordan ranked 44th out of 134 countries in the Networked Readiness Index (NRI)[1] which is in the top 50 countries around the world. Jordan ranked after the rich Arab countries like the United Arab Emirates (UAE) 27th, Qatar 29th, Bahrain 37th, Saudi Arabia 40th, and before Oman 50th, and Kuwait 57th.

Although Jordan has had some success in the ICT sector, numerous obstacles and challenges remain that are required to be overcome in turn to achieve an e-society.

[1] The NRI is a composite of three components: the environment for ICT offered by a given country or community, the readiness of the community's key stakeholders (individuals, businesses, and governments) to use ICT, and finally the usage of ICT amongst these stakeholders.

According to the national ICT strategy of Jordan (ICT-Jordan, 2007) report, the key challenges are:

1. Low internet penetration levels.
2. Gap between academia and industry sectors.
3. Difficulty to attract and retain ICT experts in Jordan.
4. Government lack of enthusiasm to support local industry.

2.1.2 Digital Divide

Bridging the gap of digital divide is a topic gathering significant exposure in the international community. According to ITU (2010a), in "measuring the information society edition", digital divide is "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities" (p.40). In wider terms, digital divide reflects the technology gap that divide the developed from the developing nations in terms of access computers, internet or even typical communication infrastructure, such as fixed telephone lines (ITU, 2010a). Moreover, according to the same source, penetration levels of mobile phone subscriptions, internet access and personal computers are some of the most frequent measures used in ICT development index.

In response to minimizing the gap in ICT, Jordan carried out aggressive steps in order to kick off its main ICT projects that intended to convert the country to an information society. However, Jordan has more work to do in order to achieve its goals to be noted as an "e-society". Some researchers have argued that "cultural and social norms" in the Arab world can extensively impact the transference of ICTs (Hill, et al., 1998; Straub, et al., 2003). Therefore, this research is a step ahead in understanding the role of social norms in the diffusion of ICT (e.g., m-commerce in this study) in Jordan and the Arab world.

2.1.3 M-commerce in Jordan

The Arab world is similar to other developing countries; mobile technologies in the region are ranging from 2G to 3.5G with multiple mobile companies in most of the Arab countries. The Global System for Mobile Communications (GSM) is operating in twenty countries in the Arab world. According to ITU (2009), the Arab world has shown a remarkable growth in mobile penetration, which ranked above the world average in 2009.

In regard to Jordan, according to the Jordanian Telecommunication Chief Commissioner, Jordan reached 101 % penetration of mobile subscribers (The-Jordan-Times, 2009). Currently, Jordan has four mobile operators companies (Zain-Jordan, Orange-Jordan, Umniah and Xpress). Jordan was one of the leading Arab

countries that introduced 2G mobile service in 1995. In addition, Zain-Jordan was the first to introduce 2.75G Enhanced Data rates for GSM Evolution (EDGE) in 2005 after it introduced 2.5G General Packet Radio Service (GPRS) technology earlier in 2002. Moreover, with 43 % of the Jordanian market in 2009, Zain-Jordan now is leading the market (Diab, 2011). Zain-Jordan services of m-commerce are well developed, (e.g. SMS, MMS, mobile-TV, internet access, conducting e-government services, and mobile banking). In addition, Orange-Jordan introduced 3G during the first quarter in 2010 (Khawam & Saadi, 2009). M-commerce required a minimum 2.5G to conduct transactions. For example, 2.5G and 2.75G were introduced in 2002 and 2005 in Jordan respectively. Meanwhile 2.5G (GPRS) can support a data rate of 100 kbps and 2.75G (EDGE) is capable of supporting 384 kbps. Both technologies are in supporting of m-commerce services (Hu, Lee, & Kou, 2005) in Jordan.

The role of Jordan in the Arab world regarding the process of ICT development including the mobile technologies is quite interesting for few reasons:

1. As mentioned earlier, the penetration rate of mobile phones in Jordan reached 101 % in 2009.

2. ICT and mobile telecommunication sectors in Jordan were the first in the Arab world to begin liberalizing its telecommunication sectors (no state monopoly). Jordan is an example of a country attempting to boost the use of ICT in an increasingly globalized world (Ciborra & Navarra, 2005).

3. Mobile telecommunication and wireless internet are in a rapid growth in Jordan. Recently, Jordan has a strong commitment to develop its "information technology infrastructure" (AbuShanab, Pearson, & Setterstrom, 2010).

4. Very few studies have addressed m-commerce adoption in Jordan; therefore, this study is necessary to fill the gap on m-commerce research.

5. As pointed out earlier, Jordan has one of the highest literacy rates in the Arab world (over 90 %).

In summation, Jordan is a young country and rich in educated human resources, that gives educators and young people an opportunity to experience and adopt new technologies at an increased rate.

2.2 IT/IS Acceptance Research Background

Dillon and Morris (1996) defined acceptance of IT as "the demonstrable willingness within a user group to employ information technology for the tasks it is designed to support" (p.5). Technology acceptance is significant since it is the vehicle that allows individuals to take part in technology that has become essential to our daily lives.

Researchers in IT/IS have developed several models and theories concerning technology acceptance and diffusion. These models and theories offering constructs (factors) that predict adoption and usage based on individuals' beliefs and attitudes

(Venkatesh, et al., 2003). In addition, theories are also based on technology determinants but not on the users' determinants who adopt the technology (Khalifa & Shen, 2008a; Charbaji, et al., 2009 ; AlHinai, et al., 2007). In the technology adoption theories, behavioral intention is examined and analyzed by conceptual frameworks inspired by the Innovation Diffusion Theory (IDT) (Rogers, 1983), the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), the Theory of Planned Behavior (TPB) (Ajzen, 1991), and the Technology Acceptance Model (TAM) (Davis, 1989). The TAM2 model (Venkatesh & Davis, 2000), the TAM3 model (Venkatesh & Bala, 2008), and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, et al., 2003) are examples of successful integration and extension.

One of the most widespread models that can explain and predict information technology acceptance behavior is the TAM. Additionally, TAM is known for its parsimony and explanatory power in IT/IS. Introduced by Davis (1989), the researcher proposed that user's behavior to use or intent to use a new information technology is determined by perceived usefulness and the user's perceived ease of use. TAM has been broadly applied to any new technology in which the individual intended to use that technology to achieve certain tasks or fulfill specific needs. Davis established TAM based on the theoretical foundation of psychological model of TRA. Davis confirmed that causal linkages between belief-attitude-intention-behavior which can predict and explain the user's acceptance of the technology. In order to predict usage, the behavioral intention is determined by attitude that, in

turn, is influenced by two beliefs: perceived usefulness and perceived ease of use. One of the major differences between TRA and TAM is the subjective norms. Davis in TAM distinguished the importance of subjective norms. However, Davis observed the difficulty to distinguish between the users own attitude and the referents on one's intent by others (Davis, et al., 1989). Since the establishment of TAM, all theories in the technology acceptance field have introduced subjective norms as a core construct (e.g., TAM2, UTAUT and TAM3).

In addition, these theories and models have a main concept, which link individual (end user) reactions and the intentions to the actual use of information systems as shown in Figure 2.2. The details of the most popular technology acceptance theories and models will be discussed in the next section.

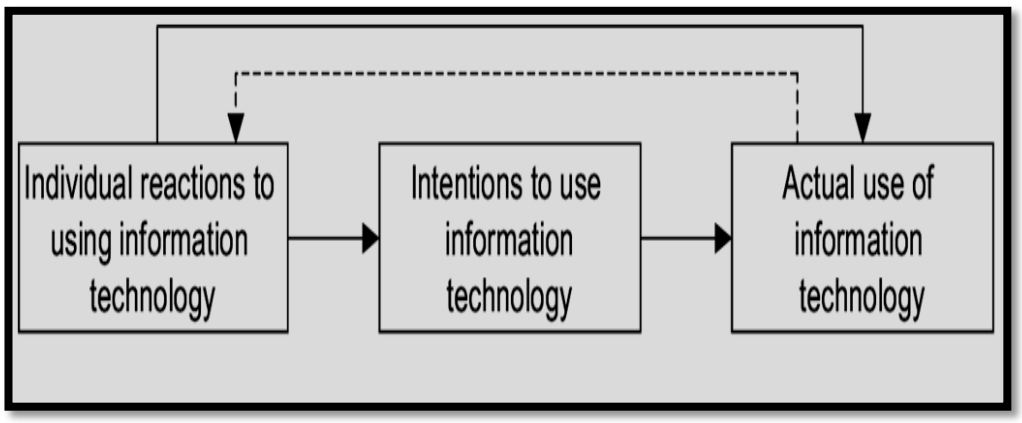

Figure 2.2: Main Concept of User Acceptance.
Source: Adopted from Venkatesh el al. (2003)

2.3 Behavioral Intention Theories: A General Perspective

2.3.1 Theory of Reasoned Action (TRA)

Fishbein and Ajzen (1975) introduced the TRA in the field of social psychology in order to explain individual's usage behavior based upon social influence, attitude, and behavioral intention as shown in Figure 2.3. While behavioral intention in TRA is determined by two main determinants: subjective norm and attitude towards behavior. Fishbein and Ajzen (1975) defined subjective norm as social pressure and opinion of others on the individual to make a decision whether or not the decision is socially acceptable. In simple terms, what other people agree or disagree about the decision of the individual is playing an important role. Fishbein and Ajzen (1975) further referred to attitude towards behavior as individual's beliefs positive or negative to perform a specific behavior. If an individual perceives and believes that the outcomes are positive, he or she will perform that behavior with a positive attitude towards performing. On the other hand, if an individual perceives and believes that the outcomes are negative, he or she will not perform that behavior and will have a negative attitude towards performing.

In fact, TRA is the backbone for some models and theories in the technology acceptance field (e.g. TAM and TPB). According to Ajzen (1991) TRA is a well-established behavioral intention model that has been used to predict and explain behavior across various domains of human behavior, including e-banking (Rouibah, Thurasamy, & May, 2009; Shih & Fang, 2004) and word processing (Davis, 1989).

In TRA, behavior must be voluntary, which does not work in an organizational context. To overcome this issue, Ajzen (1991) developed the theory of planned behavior (TPB) by adding the perceived behavioral control to be applicable for non-voluntary users.

Limitation of TRA

There are some weaknesses for TRA. First, TRA assumes that users are in a full control, and does not account the influence of control factors. In fact, TRA assumes that adoption behavior will not be impact by the user's external support (Min, Ji, & Qu, 2008). In reality, m-commerce users are not in a full control, and adoption behavior will be impacted by user's external factors for instance, barriers (e.g. cost). Second, TRA is more general than TAM. Davis (1989) stated "TRA is a general model, and as such, it does not specify the beliefs that are operative for a particular behavior" (p.984). Third, behavior in TRA must be voluntary, which does not work in organizational context. Fourth, TRA has the lowest explanatory power comparing with other relating theories in technology acceptance domain (e.g. TAM, TPB, and DTPB).

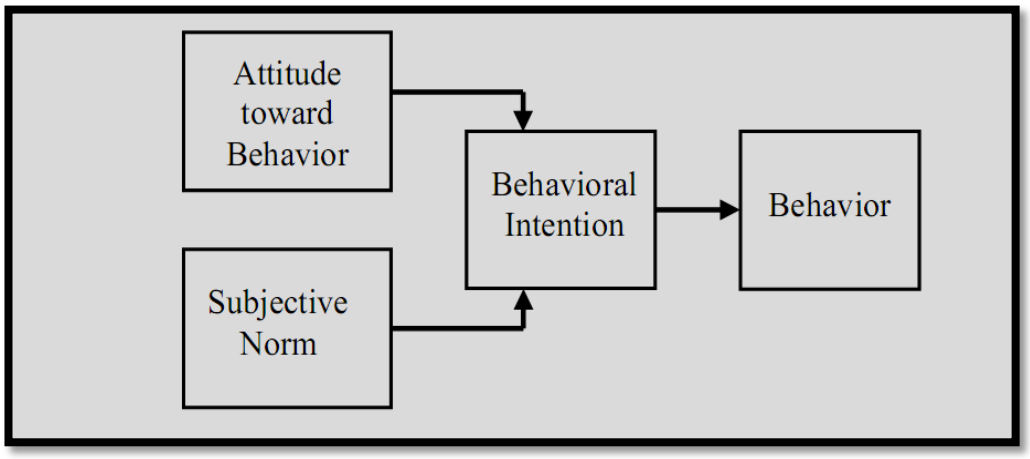

Figure 2.3: The Theory of Reasoned Action.
Source: Fishbein and Ajzen (1975)

2.3.2 Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) introduced by Ajzen (1991), it was an extension of the TRA (Ajzen, 1991; Fishbein & Ajzen, 1975). One of the limitations of TRA is working under voluntary behavior, where human behavior is not voluntary all of the time. To apply the TPB theory to non-voluntary users, Ajzen suggested a new independent determinant, "perceived behavior control" as shown in Figure 2.4. In TPB, the behavioral intention is determined by attitude towards behavior, subjective norm and perceived behavioral control. Ajzen (1991) referred to "perceived behavior control" as the constraints of the internal and external resource on individual behavior. TPB has been utilized in many studies for example, consumer product innovation (Taylor & Todd, 1995a) and Internet banking (Shih & Fang, 2004).

Limitation of TPB

Although TPB introduced a new variable (perceived behavioral control) but limitations continue to exist. The assumption that perceived behavioral control predicts behavioral intention may not consistently occur. Also, there are criticisms that perceived behavioral control was not identified as the specific belief that predicted the construct (Taylor & Todd, 1995a).

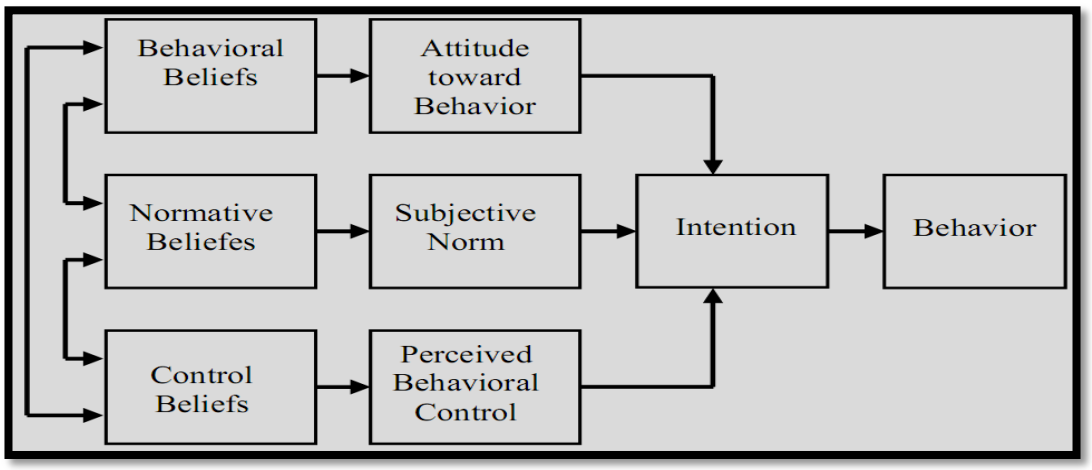

Figure 2.4: Theory of Planned Behavior (TPB).
Source: Ajzen (1991)

2.3.3 Decomposed Theory of Planned Behavior (DTPB)

Taylor and Todd (1995b) introduced Decomposed TPB model (DTPB) by deconstructing attitude into perceived usefulness, ease of use and compatibility. In addition, the authors decomposed subjective norms into peer's influence and superior's influence. Moreover, the authors decomposed perceived behavioral

control into self-efficacy, resource facilitating conditions and technology facilitating conditions as shown in Figure 2.5. According to Taylor and Todd (1995b), decomposed TPB had higher explanatory power than TAM and TPB.

Bradley (2009) indicated the weakness of decomposed TPB is "The TAM explains over 50% of variance of BI with two variables. The decomposed TPB requires seven variables to explain 60 %" (p. 285). According to Taylor and Todd (1995b), TAM explained 52 % of the variances toward behavioral intention. However, TPB explained 57 % of variances toward behavioral intention, while decomposed TPB explained 60 % of the variances toward behavioral intention.

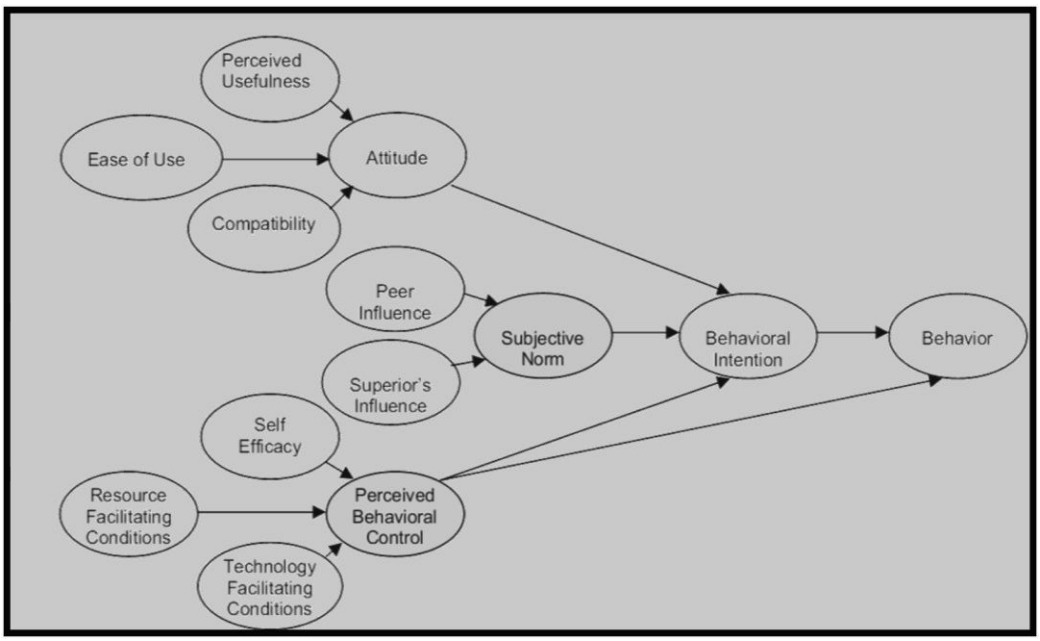

Figure 2.5: Decomposed (TPB)
Source: Taylor and Todd (1995b)

2.3.4 Innovation Diffusion Theory (IDT)

Diffusion of Innovations was developed by Rogers (1983), to understand how individuals and societies accept or reject a new innovation. According to the IDT theory, innovation transferred through communication channels for example, interpersonal, mass media, or social network and these channels can influence individual adoption decision. Rogers stated in his theory that the potential adoption process of an innovation goes through five chains of stages in the diffusion process. The first stage is knowledge, in which individual must gain knowledge of the innovation. The second stage is persuasion; in this stage, the individual is forming an attitude toward the value of the innovation. The third stage is decision, in which the individual decides to adopt or reject the innovation. The fourth stage is implementation of innovation. The fifth stage is confirmation of the decision.

Rogers (1983) suggested five attributes of a technology that could determine its adoption in the persuasion stage. The attributes are relative advantage, compatibility, complexity, trialability and observability. Based on these attributes, the individual can decide to reject or adopt that innovation. Relative advantage refers to the "degree to which an innovation is perceived as being better than the idea it supersedes" (p.213). Compatibility refers to the "degree to which an innovation is perceived as consistent with the past values, past experiences and the needs of the potential adopters" (p.223). Complexity is defined as the degree in which innovation is perceived as difficult to understand and use. Trialability refers as the degree to

"whether an innovation may be experimented with on a limited basis" (p.231). Observability is the "degree to whether the results of an innovation are visible to others" (Rogers, 1983, p. 232). IDT used in a number of researches such as smart phone adoption (Park & Chen, 2007) and mobile banking (Koenig-Lewis, Palmer, & Moll, 2010).

Limitations of IDT

There are limitations to the IDT theory. Firstly, the data necessary for complete testing of diffusion hypotheses are relatively high (Valente, 2010). It requires data at several points. Secondly, the IDT theory has not provided support on how attitude develops into the process of adopting or rejecting a new innovation (Karahanna, Straub, & Chervany, 1999).

2.3.5 Unified Theory of Acceptance and Use Technology (UTAUT)

The UTAUT was introduced and formulated as a result of a meta-analysis of constructs of eight theories/models, intended to explain the usage behavior in information technology (Venkatesh, et al., 2003). UTAUT has four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. In addition, there are four moderators: gender, age, experience and the voluntariness of use as shown in Figure 2.6.

According to UTAUT model, performance expectancy refers to “the degree to which an individual believes that using the system will help him or her to attain gains in job performance” (Venkatesh, et al., 2003, p. 447). Furthermore, effort expectancy refers to “the degree of ease associated with the use of the system” (p.450). Social influence refers to “the degree to which an individual perceives that important others believe he or she should use the new system” (p.451). In addition, facilitating conditions refers to “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” (Venkatesh, et al., 2003, p.453). In the UTAUT model, moderator factors may impact the key constructs on use behavior. In addition, the key difference between the UTAUT and the other models is distinguishing between determining factors and moderator factors. Many studies applied UTAUT to a variety of research areas such as internet banking adoption (AbuShanab, et al., 2010) and wireless LAN technology adoption (Anderson & Schwager, 2004).

Strengths and Limitations of UTAUT

UTAUT model has a strong theoretical foundation and comprehensive. Moreover, the model can explain up to 70% of the variance towards behavioral intention. However, according to Benbasat and Barki (2007) UTAUT is a reincarnation of TPB. The authors argued that after years of investigation, social influences and facilitating conditions in UTAUT are being added to the two “fundamental determinants” of TAM (perceived usefulness and perceived ease of use). Adding

together social influences and facilitating conditions and TAM results in a model that is very similar and not different than TPB model (Benbasat & Barki, 2007).

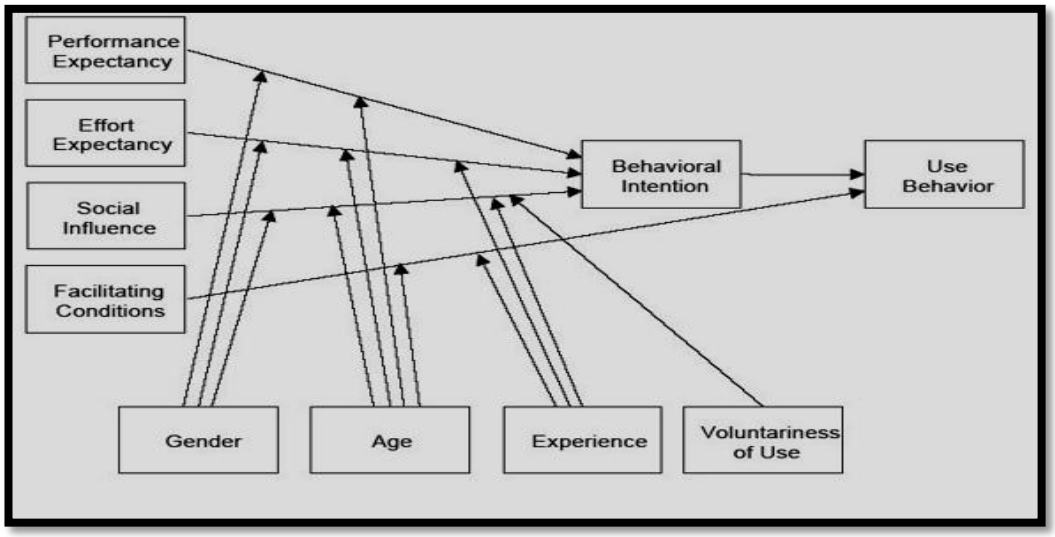

Figure 2.6: UTAUT Model
Source: Venkatesh et al. (2003)

2.3.6 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is the most popular model used to predict and explain the behavioral intention of end-users. As mentioned earlier, Davis (1989) developed TAM to study the usage and behavioral intention based on the theoretical foundation of a psychological model Known as TRA. Furthermore, Davis stated that causal linkages between belief-attitude-intention-behavior which can predict and explain the user's acceptance of a technology. In order to predict usage, the behavioral intention is determined by attitude that, in turn, is influenced by two beliefs: perceived usefulness and perceived ease of use (Davis,1989). Davis

referred to perceived usefulness as the degree to which the end-user believes that using the system will enhance the performance (Davis,1989). While, on the other hand, perceived ease of use referred to the degree to which the end-user believes that using the system will be free of effort. According to Davis (1989), perceived usefulness and perceived ease of use are the "fundamental determinants" of predicting the end-user technology acceptance. In summary, TAM includes four factors to predict system usages: perceived usefulness, perceived ease of use, attitude, and behavioral intention as shown in Figure 2.7.

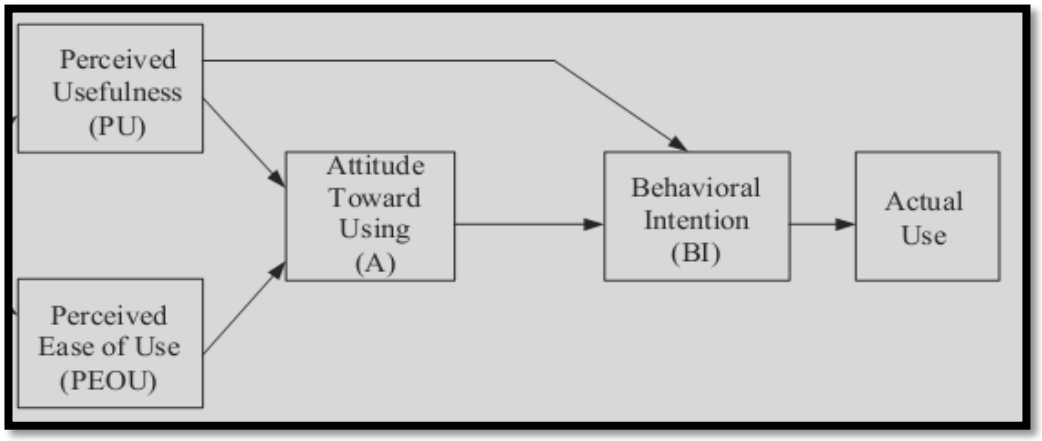

Figure 2.7: Technology Acceptance Model (TAM)
Source: Davis (1989)

2.3.7 Extended TAM Model (TAM2)

One of the most remarkable extensions of the TAM Model is (TAM2) (Venkatesh & Davis 2000) as shown in Figure 2.8. TAM2 developed by Venkatesh and Davis in terms to explain more about perceived usefulness and behavioral intention with

omitting attitude. The extension applied new determinants such as subjective norm, job relevance, image, output quality, result demonstrability, experience and voluntariness into the body of TAM. They found that the extension of TAM and its new determinants have significantly influenced user acceptance. One of the most remarkable new determinants is subjective norm. Extended TAM Model (TAM2) was expanded to include subjective norms as one of the determinants of perceived usefulness through the internalization process. TAM2 has been in a cross range of prior technology research fields conducted by (Rouibah, et al., 2011; Venkatesh & Davis, 2000).

The criticism of TAM2 is that overall the model cannot explain the variance of the systems user's more than 34-52 %. Another criticism is the model become more complex and less parsimonious compared to the original TAM.

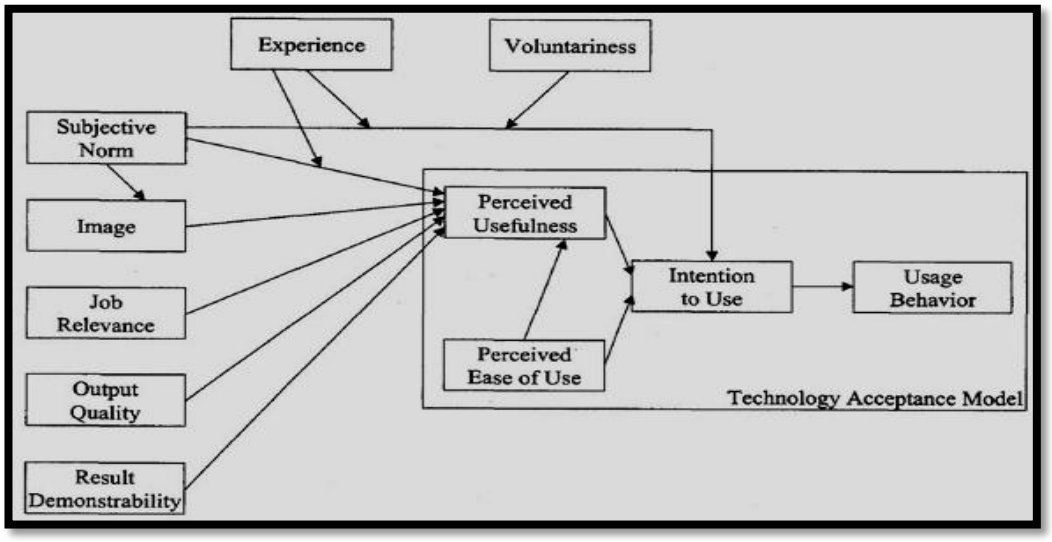

Figure 2.8: Extended TAM Model (TAM2)
Source: Venkatesh and Davis (2000)

2.3.8 Extended TAM (TAM3)

One of the newest extensions to TAM by Venkatesh and Bala is the TAM3 model. They introduced TAM3 in 2008 while developing a comprehensive theoretical framework that decomposed perceived ease of use in further details (Venkatesh & Bala, 2008). TAM3 suggested new determinants, such as computer self-efficacy, perceptions of external control, computer anxiety, computer playfulness, perceived enjoyment and objective usability. Further, Venkatesh and Bala suggested that "experience will moderate the relationships between (i) perceived ease of use and perceived usefulness; (ii) computer anxiety and perceived ease of use; and (iii) perceived ease of use and behavioral intention" (Venkatesh & Bala, 2008) as shown in Figure 2.9.

They suggested that the determinants of usefulness will not influence ease of use and the determinants of ease of use will not influence usefulness. Therefore, TAM3 does not possess crossover effects. In conclusion, the researchers argued that TAM3 is a complete and comprehensive "nomological network" of the determinants of user' IT adoption and use.

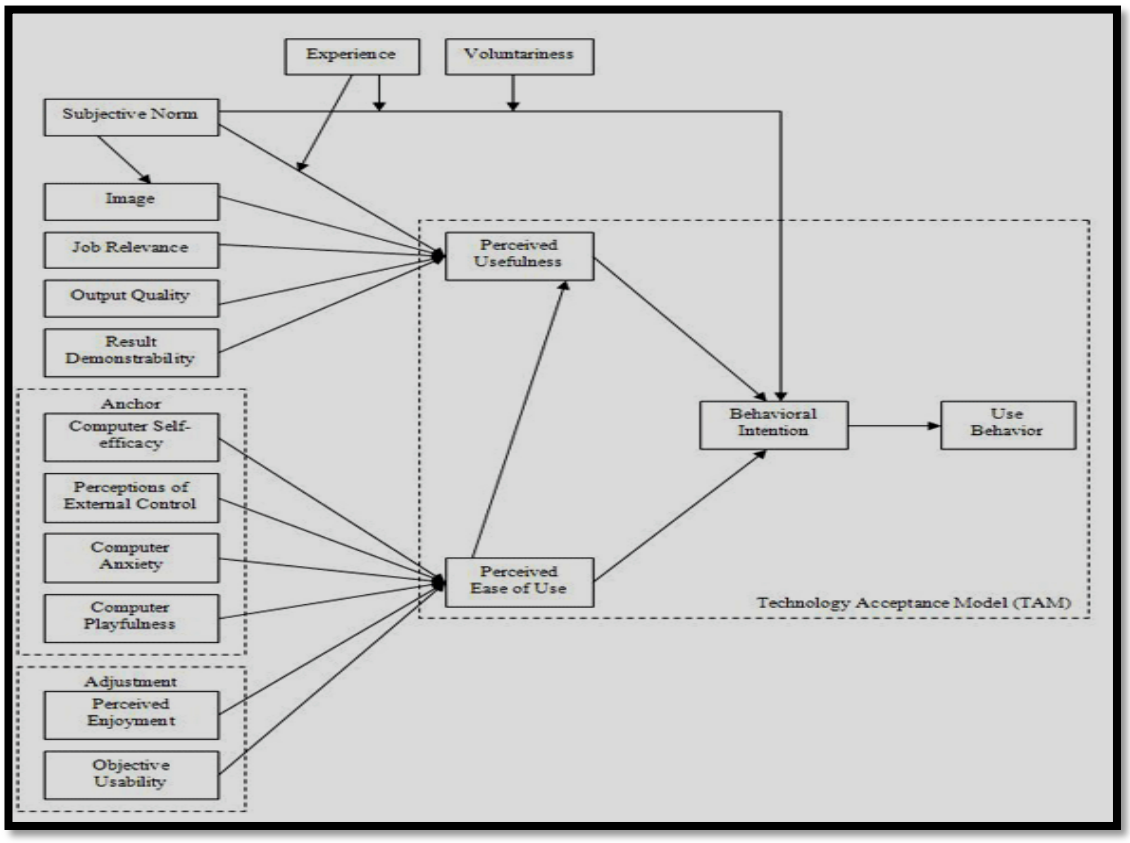

Figure 2.9: Extended TAM2 Model (TAM3)
Source: Venkatesh and Bala (2008)

2.4 Overview of TAM

2.4.1 Advantages of TAM

There have been strengths and weaknesses for TAM. According to Venkatesh and Davis (2000), TAM has become a well-established, powerful and parsimonious model for explaining and predicting information systems end-users acceptance and has been used in a number of technology contexts. For example, electronic banking

(Rouibah, Ramayah, & May, 2009), PDA usage (Liang, Xue, & Byrd, 2003), electronic commerce (Pavlou & Chai, 2002), internet adoption (Nguyen & Barrett, 2006) and email system (Serenko, 2008). The second strength is that TAM is considered less general than TRA (Davis, et al.,1989). On the other hand, Mathieson, Peacock and Chin (2001), stated that TAM is limited by not addressing the lack of barriers that prevent the end-users from using information systems. Moreover, additional researchers criticized TAM for its shortcomings. For example, Malhotra and Galletta (1999) believed when end-users adopt a system it is a result of social influences. Social influence is not accounted for TAM; also one of these social influences is culture. According to Urbaczewski, Wells, Sarker and Koivisto (2002), the addition of culture as a factor might determine the failure or success of a system. Researchers suggested that TAM would have more explanatory power through modifications and extensions of the model. A typical extension suggests a number of factors for perceived usefulness and perceived ease of use. A second extension suggests introducing social factors of use or intended use. A third extension suggests including behavioral control as explanatory concepts (Pedersen, 2005).

2.4.2 TAM vs. Other Theories

Overall, behavioral intention acceptance theories and models have numerous factors that determine technology acceptance, as shown in Table 2.1. It appears that no theory or model is incorrect. In addition, every single model and theory in

technology acceptance has been developed and extended in the USA. Researchers of information systems have developed models based on social psychology models, as a theoretical base for research. The logic reasoned behind their choice was insufficient ground theory in information systems field. In the previous researches, the theories and the models could predict user acceptance behavior, but lacked the ability to address all constructs in a single comprehensive theory with high explanatory power. For instance, "TAM contains users' perception, TPB focuses on external environment including organization, and IDT emphasizes the innovation characteristics of technologies, which makes models have unsatisfactory explanations" (Liu & Chen, 2009, p.94). Each of the discussed theories has factors that have been used frequently and some factors are totally ignored. For example, attitude is a main factor in TRA, TPB and TAM; however, attitude has been ignored in TAM2, TAM3, and UTAUT. In comparison, each theory (TAM, TPB, DTPB and TRA) has obvious strengths in terms of explaining behavioral intention. The findings showed that the TAM and the TPB, DTPB models are comparable. Nevertheless, when behavioral intention is measured, the results showed enhancement in explanatory power for both the TPB and DTPB over the TAM (Taylor & Todd 1995b). Moreover, TAM does not account for social norms as determinant of behavioral intention, which is a core construct in TRA and TPB and DTPB. In addition, the authors found that DTPB explained variances over TAM by 2 %. While the TAM model is uncomplicated in predicting usage behavior; DTPB provides a

total understanding of behavioral intention by explaining the effects of subjective norms and control beliefs (Taylor & Todd 1995b).

Table 2. 1: Factors in Technology Acceptance Theories/Models

Theory/ Model Name	Factors
TRA	Behavioral Intention, Attitude, Subjective Norms.
TPB	Behavioral Intention, Attitude, Subjective Norms, Perceived Behavioral Control.
DTPB	Behavioral Intention, Attitude, Subjective Norms, Perceived Behavioral Control, Perceived Usefulness, Ease of Use, compatibility, Peer Influence, Superior's Influence, Self-Efficacy, Resource Facilitating Conditions and Technology Facilitating Conditions.
IDT	Relative advantage, Compatibility, Complexity, Trialability, and Observability.
UTAUT	Behavioral Intention, Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions. Moderators: Gender, Age, Experience and Voluntariness.
TAM	Behavioral Intention, Attitude, Perceived usefulness, perceived ease-of use.
TAM2	Behavioral Intention, Perceived usefulness, perceived ease-of use, Subjective Norms, Image, Job Relevance, Output Quality, Result Demonstrability. Moderators: Experience and Voluntariness.
TAM3	Behavioral Intention, Perceived usefulness, perceived ease-of use, Subjective Norms, Image, Job Relevance, Output Quality, Result Demonstrability , Computer Self-efficacy, perception of External Control, Computer Anxiety, Computer Playfulness, Perceived Enjoyment, Observed Usability. Moderators: Experience and Voluntariness.

2.4.3 Limitations of TAM

Most of theories of technology acceptance have been developed in countries such as the USA. Additionally, many of the technology acceptance theories have not been broadly investigated outside of developed countries such as in the Arab countries (Almutairi, 2007), while findings have been inconsistent where these theories have been tested in developing countries (AbuShanab, et al., 2010; Bandyopadhyay & Fraccastoro, 2007). A number of authors have suggested that this inconsistent in predictive power could be associated to the differences in the cultures within the particular nations (AbuShanab, et al., 2010; Bandyopadhyay & Fraccastoro, 2007). Several studies compared developing countries to the USA (where technology adoption theories have been developed) and concluded that culture (throughout perceptions of social influence) influenced behavioral intention and they argued that end-users in different cultures respond differently based on what important others in their social connections think (Bandyopadhyay & Fraccastoro, 2007; Dai & Palvia, 2009; Mao, Srite, Thatcher, & Yaprak, 2005; Yang, 2010). Therefore, Almutairi (2007) stated that " serious concern is raised about the applicability of TAM to non-Westren countries, and more specifically to Arab countries" (p.59). Consequently, this study tested the applicability of technology acceptance model (TAM) in different culture context such as the Arab culture and particularly Jordan in regard to m-commerce adoption.

Although TAM is practically explaining intention, but extensions are needed to further examine behavioral intention toward m-commerce usage; due to the insufficient power of just two constructs (PU and PEOU) to explain behavioral intention. Therefore, limitations of TAM lead this research to extended TAM in four ways. First, TAM does not include subjective norms (Mathieson, 1991). Second, the TAM model is usually applied in a work-related context, which does not imply personal innovativeness in IT. Since m-commerce is used by individuals and not shared among people; TAM does not address individuals who are enthusiastic information seekers. Innovative individuals are able to manage the high levels of risk and uncertainty and build up a more favorable attitude toward innovation (Rogers, 1983). Third, facilitating conditions are not considered in TAM. In fact, Davis assumed that everyone is in control of the resources regarding adopting a new system. Fourth, cost is one of the obstacles in adopting m-commerce. According to Wei et al. (2009) high cost can decrease the acceptance rate of m-commerce. M-commerce services involve fees (connections fees, subscription fees or roaming fees). TAM does not explain cost factor, because TAM was applied mostly in an organizational context that does not involve cost by the end-users in workplace.

This research intends to address the above limitations by augmenting subjective norm, personal innovativeness in IT, facilitating conditions and cost. The exclusion of subjective norm was found to be weakness of TAM.

2.5 M-commerce Adoption Research Background

Researchers used a range of IT adoption theories in m-commerce studies in order to predict trends and identify drivers to adopt m-commerce. However, the most used theoretical background in the m-commerce adoption studies is TAM. In addition, researchers have integrated, extended, enriched, widened, augmented, modified, and decomposed the TAM model to be an appropriate fit into the m-commerce user acceptance studies (Min, et al., 2008). TAM is the base theory for this study for a few reasons. First, it received more interest and attention than other models from researchers as well as from practitioners. Second, TAM is the backbone for TAM2, TAM3 and UTAUT. Third, numerous investigators proved the significance and the empirical support of TAM in predicting IT acceptance behavior.

Furthermore, several determinants have been explored through the literature that influenced the acceptance of m-commerce. For instance, Wu and Wang (2005) extended TAM with cost, perceived risk and compatibility in a study of 850 customers surrounding the motivation behind mobile commerce in Taiwan. The results supported the hypothesis that perceived usefulness, cost, perceived risk and compatibility all significantly affected behavioral intention to adopt m-commerce. The study also found that perceived ease of use had no direct impact on intention to adopt m-commerce, but it was found significant through perceived usefulness. Compatibility was the most important effect on intention to adopt m-commerce. Accordingly, cost had the least impact on behavioral intention of mobile commerce in Taiwan. Other researchers, Wei et al. (2009) augmented TAM with social

influence, perceived cost and trust. In the same way, Kargin and Basoglu (2006) extended TAM for mobile services adoption with constructs regarding satisfaction, experience, entertainment, mobility, personalization, social, and innovativeness. Meanwhile Kim and Garrison (2009) enriched TAM with perceived ubiquity, perceived reachability, and job relevance. According to Kuo and Yen (2009), the end-user is the center of the m-commerce value chain. The success of m-commerce relies on many determinants including technology innovation. Ultimately, the potential end-users are those who decide whether to adopt or reject the technology.

In the next following sections, the researcher will focus on four factors (facilitating condition, personal innovativeness in IT, cost and subjective norms) and their relationships in TAM structure.

2.6 Facilitating Conditions Construct

Facilitating conditions are defined as external environments of serving individuals to remove (overcome) barriers and difficulties to use a new technology (Gu, Lee, & Suh, 2009; Venkatesh, et al., 2003). Facilitating conditions factor is a "core construct" in UTAUT that effecting use behavior. Furthermore, facilitating conditions implicated two aspects: resource aspects (e.g., time and money) and technology aspects, relating to technology (resources) issues that limited usage (Lu, Liu, Yu, & Wang, 2008; Taylor & Todd, 1995b). Behavioral intention and

technology usage "would be less likely if less time or money is available and when technical incompatibility exists" (Lu, et al., 2008, p. 55). Furthermore, in working settings, facilitating conditions are believed to consist of the availability of training and support (Venkatesh, et al., 2003). Others viewed external control such as policies, regulations, and legal environment which are critical to m-commerce acceptance (Lu, et al., 2008). In addition, government influence in regulated m-commerce could be one of the external control factors (Lu, et al., 2008). In a study of mobile banking acceptance in Korea by (Gu, et al., 2009), facilitating conditions was identified as one of the antecedents of perceived ease of use. Lu et al. (2008) investigated the determinants of accepting wireless mobile data services in China. In their study, they found that facilitating conditions factor was influencing perceived usefulness, but not perceived ease of use. In TAM, facilitating conditions factor is not considered. In fact, Davis assumed that everyone is in control of the resources regarding the adoption of a new system (Davis, 1989). According to Venkatesh, Brown, Maruping, and Bala (2008), behavioral intention is a reflection of the users or potential users' internal representation of beliefs. TAM does not support the external factors that can affect the performance of an adoption (behavior). In other words, the role of external factors (facilitating conditions) that can potentially facilitate or hold back the performance of a behavior is not captured by TAM.

2.7 Personal Innovativeness in IT Construct

Personal innovativeness in information technology (PIIT) was proposed by (Agarwal & Prasad, 1998). The researchers argued that “the effects of PIIT are manifested in technology acceptance behavior through its relationships with beliefs and perceptions” (Agarwal & Prasad, 1998, p. 207). Building upon Rogers’ theory of IDT, Agarwal and Prasad argued that individuals with higher PIIT are anticipated to develop more positive beliefs about the new technology (Lu, et al., 2005). PIIT is conceptualized as a personal trait, and refers to “the willingness of an individual to try out any new information technology " (Agarwal & Prasad, 1998, p. 206).

For example, in a study by Yang (2005) examining the effect of demographic characteristics and innovativeness on end-user adoption of m-commerce in Singapore; the researcher found that TAM is a strong predictor of m-commerce adoption. However, mixed results were found, as perceived usefulness was a powerful predictor of consumers’ acceptance of m-commerce but not perceived ease of use. Innovativeness was a positive and consistent predictor of user perceived usefulness and perceived ease of use, and age was found to positively predict consumer perceived usefulness, but not perceived ease of use. It was concluded that demographic characteristics are not powerful and are not consistent predictors of m-commerce adoption.

Technology adoption theories were usually applied in a work-related context, which does not imply personal innovativeness in IT factor. Since m-commerce is utilized

by individuals and not shared among people. Technology adoption theories (e.g., TAM, TAM2, UTAUT, TRA, TPB and DTPB) do not address the individuals who are enthusiastic information seekers. Innovative individuals are able to manage the high levels of risk and uncertainty and build up a more favorable attitude towards innovation (Rogers, 1983).

In regard to Jordan, Al-Khasawneh (2010) found that mobile internet adoption for Jordanians showed a high degree of affinity for new ICT. Innovative individuals' in technology acceptance studies in the Arab countries have received little attention from scholars.

2.8 Cost Construct

Cost is defined as the degree to which users perceive that using m-commerce is expensive (costly) (Wei, et al., 2009). Individuals may decide not to use the m-commerce services due to price considerations. Prices, costs or fees (e.g., additional expenses, equipment costs, access cost, and transaction fees) are important components that make m-commerce use more costly than the traditional e-commerce (Wu & Wang, 2005).

Cost is one of the obstacles in adopting m-commerce. Wei et al. (2009) argued that high cost can decrease the acceptance rate of m-commerce. Moreover, m-commerce services require fees (connections fees, subscription fees or roaming fees).

A number of studies argue that cost could be a main barrier for the acceptance of m-commerce. For example, in a study investigating behavioral intention to use mobile banking in Taiwan, the researchers found that perceived financial cost is negatively effecting the behavioral adoption towards the usage of m-banking. In a study by Shin (2011), the researcher argued that cost of using 4G including the initial investment in devices, subscription initiation, charges and monthly payments are negatively influencing intention. Shin found that perceived cost is affecting intention to adopt 4G. The TAM model and other technology adoption theories do not explain the cost factor, because most theories were applied mostly in an organizational context that did not involve a cost to the end-users in the workplace.

2.9 Subjective Norms Construct

Subjective norms (or social influence) is referred to the belief of the individual regarding the expectations of important others to perform the behavior (Taylor & Todd, 1995a). Davis et al. (1989) argued that subjective norm has no effect on technology acceptance. Other researchers believe subjective norms are important factor "core construct" in technology acceptance (Ajzen, 1991; Bhattacherjee, 2000; Fishbein & Ajzen, 1975; Taylor & Todd, 1995a; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000; Venkatesh, et al., 2003).

There are three recognized reasons can be acknowledged; why the subjective norms in m-commerce adoption required further investigation.

First, subjective norms through the technology acceptance field had inconsistent and conflicting findings towards behavioral intention (Ramayah, et al., 2009; Schepers & Wetzels, 2007). In the existing literature of technology acceptance and the m-commerce field, Davis (1989), Mathieson (1991), Turel, Serenko and Bontis (2007), Khalifa and Shen (2008b) and Lu,Liu,Yu and Wang (2008) found subjective norms towards behavioral intention were insignificant. On the other hand, Venkatesh and Davis (2000), Taylor and Todd (1995b), Wei, Marthandan, Chong, Ooi and Arumugam (2009), Nysveen, Pedersen and Thorbjørnsen (2005b) and Yaseen and Zayed (2010), found a significant relationship between subjective norms and behavioral intention.

Second, unlike most of the technology adoption by users in an organizational context, adopting m-commerce in individual context is voluntary and takes place often in social environments. Liu and Li (2011) stated that since the technology acceptance model (TAM) is initiated from "studying computer-based work-related IT innovations, it does not consider the unique nature of mobile technologies which tends to be used personally in a variety of social contexts" (p.891). These social environments influence individuals' attitude and beliefs such as perceived usefulness and perceived ease of use. Therefore, further examination of how subjective norms

affecting individuals' attitude, perceived ease of use and perceived usefulness may contribute to the greater usage and diffusion of m-commerce.

Third, different contexts in technology adoption research typically have viewed subjective norm as "a single construct that includes the effects of various salient referents" (Eckhardt, et al., 2009, p. 11). Some authors argued that subjective norm "has limited conceptualization because it only deals with restricted normative components and does not reflect wider societal contexts" (Lee, et al., 2006, p. 60). Furthermore, subjective norms can be divided into two levels: personal and societal levels (Park & Smith, 2007). The literature of the technology acceptance field focused on individuals' level of technology adoption, while the conceptualization of societal level has been counted out. Therefore, this has formed a need for further research to investigate the phenomenon of subjective norms and to identify the key antecedents that determinants (distinguish) subjective norms from individual influence levels as well from societal influence levels.

The next sections will discuss in more details the importance of subjective norms in collectivist cultures regarding technology acceptance, mechanisms of subjective norms, the difference between subjective norms and social influences and the difference between injunctive and descriptive norms.

2.9.1 The Role of Subjective Norms in Collectivist Cultures

Culture refers to social norms, beliefs, and values of a specific group and it can impact a significant amount of variation in consumer behavior (Yang, 2010). Moreover, social influences stand for societal pressure on individuals to engage in a certain behavior, "this social pressure for an individual to perform a behavior varies by culture" (Bandyopadhyay & Fraccastoro, 2007, p. 521). In individualism cultures, an individual is less worried with the thoughts and opinions of others and, consequently, the individual feels less pressure to conform to any specific behavior. However, in collectivism cultures, where the group more likely to be more significant than the individual, the individual is more likely to be concerned about the thoughts, opinions and beliefs, of others and, therefore, more likely to be socially influenced by important others (Bandyopadhyay & Fraccastoro, 2007). Moreover, in a strong collectivist culture, social norms are valued and these social norms can play a significant role in adopting or rejecting a new technology (Ramayah, et al., 2009; Rouibah & Ould-Ali, 2009).

In a study by Loch et al. (2003) regarding the diffusing of the Internet in a collectivist culture such as the Arab world. They argued that subjective norms are "clearly related to culture or is even a component of it" (p.48). In other words, subjective norms are part of the culture, and different cultures have different influence on subjective norms. Therefore, researchers found that subjective norms are playing an important role in the diffusing of the Internet.

In a cross-cultural study, Dai and Palvia (2009) examined ten various factors affecting m-commerce adoption in the USA (individualism culture) and China (collectivism culture). Drawing factors from TRA, TAM, IDT and other fields; the researchers' analysis revealed that culture (the effect of culture through the subjective norms) is important and differences in uncertainty avoidance, power distance and individualism-collectivism have a significant influence on users' intention in the USA and China. The study also found that in the USA, privacy perceptions, innovativeness, usefulness, enjoyment, and compatibility had a significant influence on users' intention to use m-commerce. On the other hand, ease of use, and subjective norms had no significant influence on behavioral intention in the USA. In contrast to China, innovativeness, usefulness, ease of use, cost, and subjective norms have significantly influenced users' intention to use m-commerce. The authors concluded there were numerous important differences between the antecedents and the influences on the end-user behavioral intention to use m-commerce in the USA and China.

2.9.2 Mechanisms of Subjective Norms

According to Venkatesh et al. (2003), subjective norms are complex regarding technology acceptance decisions and subject to a broad range of contingent influences. Subjective norms operate through three mechanisms: identification, compliance and internalization (Bhattacherjee, 2000; Karahanna, et al., 1999;

Schepers & Wetzels, 2007; Sun & Zhang, 2006; Venkatesh, et al., 2008; Venkatesh & Davis, 2000; Venkatesh, et al., 2003; Venkatesh & Zhang, 2010). In addition, Karahanna, Straub and Chervany (1999) viewed identification and compliance as (normative influence), and internalization viewed as (informational influence). Rogers (1983) suggested in his theory of diffusion of innovation that people form opinions about new innovation in two ways: interpersonal influence (normative influence) such as peers, superiors and family or by external influence (informational influence) such as other non-personal information.

Identification refers to "an individual's belief that performing a behavior will elevate his or her social status within a referent group because important referents believe the behavior should be performed" (Venkatesh & Bala, 2008, p. 277). In other terms, identification results from the advocate to be observed as being alike to a desired person or referent group (Bhattacherjee, 2000). Compliance refers to the "situation in which an individual performs a behavior in order to attain certain rewards or avoid punishment" "(Venkatesh & Bala, 2008, p. 277). While internalization results from incorporation (accepting) of a referent's belief and integrated into one's own cognitive system (belief structure) (Karahanna, et al., 1999). Furthermore, according to Venkatesh and Zhang (2010), the effect of identification and internalization are more pertinent (significant) in voluntary settings; on the other hand, the effect of compliance is more pertinent (significant) in mandatory settings.

Furthermore, Venkatesh and Davis (2000) argued that the effect of subjective norms on behavioral intention goes through the compliance mechanism and the effect of subjective norms on perceived usefulness goes through internalization mechanism.

2.9.3 Difference between Subjective Norms and Social Influence

According to Venkatesh et al. (2003), there are similarity between subjective norms and social influence. Subjective norms refer to "the degree to which an individual perceives that most people who are important to him think he should or should not use the system" (Venkatesh & Bala, 2008, p. 277). Social Influence is defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh, et al., 2003, p. 451). Moreover, Venkatesh et al. (2003) stated that "while they have different labels, each of these constructs contains the explicit or implicit notion that the individual's behavior is influenced by the way in which they believe others will view them as a result of having used the technology" (p.451).

In sum, Lee et al. (2006) stated that "While social influence has been measured using different terminology such as social factors, social pressure and social norms, they used the same measurement scales of subjective norm when they are actually measured" (p.61).

2.9.4 Difference between Injunctive and Descriptive Norms

According to Hagger and Chatzisarantis (2005), social psychological literature made a distinction between perceptions of normative influences in which the behavior is approved by others (injunctive norms), and the normative influences in which a behavior is typically performed by others (descriptive norms). Given the usual measures of subjective norm by perceived pressure to perform, the target behavior by important others, it is a type of injunctive norm.

The descriptive norm construct is not accounted for in the technology acceptance and m-commerce field. Descriptive norm is proposed to have a unique effect and independent component of subjective norms because it taps perceptions of whether the behavior is appropriate in a given situation (Hagger & Chatzisarantis, 2005). However, Ramayah made a distinction between injunctive and descriptive norms by using the TRA and found that the decomposing subjective norms is significant (Ramayah, et al., 2009).

2.10 Related Studies - Determinants of M-commerce Adoption

Several determinants have been explored through the literature that influenced the adoption of m-commerce. This section presents details of related studies that investigate the determinants which influence m-commerce adoption. TAM in the domain of m-commerce has received a great deal of attention as the dominant

theoretical framework in m-commerce adoption studies. Therefore, this review of related studies is focused on TAM studies and its relationships with the new proposed factors.

For example, in a study of 579 Finland consumers by Verkasalo et al. (2010), studying the consumer intention to adopt and use three smart phone applications (games, internet service and map services). The authors extended TAM to include additional factors. In addition, researchers divided consumers into two groups: users and non-users. Subjective norms had inconsistent findings regarding the three applications (games, internet service and map services). Behavioral control is significant in all models and subjective norms were conflicting (users and non-users). They concluded that behavioral control is an important concept, and subjective norm needs further examination.

In another example, Khalifa and Shen (2008b) extended TAM and integrated self-efficacy from DTPB in the model. They surveyed 202 subscribers of mobile services to examine the factors that influenced individual adoption of business to consumer transactional m-commerce in Hong Kong. The authors decomposed perceived usefulness to five factors: cost, convenience, privacy, efficiency and security. The study found significant effects of these factors on perceived usefulness. Cost was the "utmost importance to potential adopters". The study also found that perceived usefulness and self-efficacy were strong predictors of behavioral intention in Hong Kong. Perceived usefulness was the most important factor that explained 69.2 % of

the variants in their model. On the other hand, Khalifa and Shen hypothesized that subjective norms and perceived ease of use could predict behavioral intention. The results indicated that subjective norms and perceived ease of use were insignificant determinants of behavioral intention.

In a study investigating m-commerce in Malaysia by Wei et al. (2009), the purpose of the study was to investigate the factors that influence the consumer intention to use m-commerce in Malaysia. Based on TAM, Wei et al. (2009) hypothesized that perceived usefulness, perceived ease of use, social influence, perceived financial cost and trust were the predictors of m-commerce adoption in Malaysia .The results confirmed that perceived usefulness, social influence, perceived financial cost and trust significantly influenced consumer intention to use m-commerce. However, perceived ease of use and trust were an insignificant influence on consumer intention to use m-commerce.

The next sections will discuss the determinants (antecedents) of behavioral intention, attitude, perceived usefulness, perceived use of use and subjective norms from previously studied contexts in the literature review of m-commerce. In addition, the researcher will discuss the relationships in detail.

2.10.1 Determinants of Behavioral Intention

Behavioral intention is "a measure of the strength of one's intention to perform a specified behavior" (Davis, et al., 1989, p. 984). Many researchers have confirmed that there is a high correlation between behavior to use and behavioral intention (Davis, 1989; Ramayah, et al., 2009). Furthermore, the majority of theories in the technology acceptance field have used behavioral intention as an antecedent of behavior to use (e.g., TRA, TPB, TAM, DTPB, TAM2, TAM3 and UTAUT). In this study, the following paragraphs are focusing on the effect of five antecedents on behavioral intention as follows: (1) the relationship between attitude and behavioral intention (2) the relationship between perceived usefulness and behavioral intention (3) the relationship between facilitating conditions and behavioral intention (4) the relationship between personal innovativeness in IT and behavioral intention and (5) the relationship between cost and behavioral intention.

(1) The relationship between attitude and behavioral intention

Attitude is the degree of the individuals' positive or negative feeling towards performing a particular behavior (Fishbein & Ajzen, 1975). Attitude is one of the "core constructs" in TRA. Fishbein and Ajzen (1975) confirmed that attitude can predict behavioral intention. Furthermore, attitude had a strong and a direct relationship towards behavioral intention.

In m-commerce settings, several past studies showed that attitude is an important factor for predicting behavioral intention (Cheong & Park, 2005; Jayasingh & Eze, 2010; Kim, Ma, & Park, 2009b; Liang & Yeh, 2011; Nysveen, Pedersen, & Thorbjørnsen, 2005a; Nysveen, et al., 2005b; Shin, 2011). The findings of the studies indicated that attitude is directly influencing behavioral intention significantly and positively as shown in Table 2.2.

For instance, Nysveen et al. (2005b) conducted a study examine the significance of antecedents of usage intention of mobile services on 2038 students in Norway. The findings supported that attitude was influenced by perceived enjoyment, perceived usefulness, and perceived ease of use. In addition, attitude, perceived expressiveness, perceived enjoyment, perceived usefulness, perceived ease of use, normative pressure and perceived control all had a significant and a direct influence on intention to use mobile services.

Shin (2011) reports in his study in relation to examining the factors influencing customers' intentions to adopt 4G mobile that attitude was significantly and positively impacting behavioral intention. In addition, Cheong & Park (2005) confimed in a study among 1279 individuls in Korea that attitude was indeed significantly related to behavioral intention.

After a review of the literature, all studies (Cheong & Park, 2005; Jayasingh & Eze, 2010; Kim, et al., 2009b; Liang & Yeh, 2011; Nysveen, et al., 2005a; Nysveen, et al., 2005b; Shin, 2011) investigated attitude toward behavioral intention. It is evident

that attitude has been investigated with different context and it demonstrated consistent results towards behavioral intention.

(2) The relationship between perceived usefulness and behavioral intention

Perceived usefulness is one of the fundamental constructs in TAM. Perceived usefulness is defined as the prospective person's subjective evaluation that using a particular system would increase the person's job performance (Davis, et al., 1989). In addition, perceived usefulness has been proven as an antecedent of behavioral intention in TAM (Davis, et al., 1989). Numerous studies in the domain of m-commerce have investigated perceived usefulness upon user's behavioral intention (Cheong & Park, 2005; Dai & Palvia, 2009; Khalifa & Shen, 2008b; Koenig-Lewis, et al., 2010; Liu & Chen, 2009; Lu, et al., 2008; Lu, et al., 2005; Luarn & Lin, 2005; Mao, et al., 2005; Nysveen, et al., 2005b; Sripalawat, Thongmak, & Ngarmyarn, 2011; Wei, et al., 2009; Zhang & Mao, 2008). The results in most of the studies revealed that perceived usefulness was significantly and positively influencing behavioral intention with the exception of two studies (Bhatti, 2007) and (Nysveen, et al., 2005a) which showed mixed results between males and females towards behavioral intention as shown in Table 2.2.

Furthermore, after reviewing the literature of m-commerce, perceived usefulness has received considerable attention from researchers during investigation the relationship toward behavioral intention. The findings indicated that most of the studies showed perceived usefulness to have consistent, significant and positive relationships toward

behavioral intention. However, two studies found the relationships were insignificant.

(3) The relationship between facilitating conditions and behavioral intention

Facilitating conditions is derived from perceived behavioral control in TPB and is used as an antecedent of the key construct (Gu, et al., 2009). Facilitating conditions as an external control can play a significant role in the early phases of users' experience with a system (Venkatesh & Davis, 2000). Facilitating conditions are viewed as an external control in the environment such as availability of resources in conducting a specific behavior.

In UTAUT theory, facilitating conditions showed affect on "use behavior" factor not on the behavioral intention. However, there are just two studies as far in m-commerce context that investigated the relationship between facilitating conditions and behavioral intention (Biljon & Kotzé, 2008; Wu, Tao, & Yang, 2008). The results of the studies indicated that facilitating conditions directly influenced behavioral intention in significant and positive way. Other contexts (e.g., internet/WWW) were tested the relationship, and found there was a significant and a direct relationship toward behavioral intention (Chang & Cheung, 2001). Biljon and Kotzé (2008) confirmed in the study using UTAUT that mobile phones users' facilitating conditions were significantly and directly impact behavioral intention. In addition, Wu, Tao and Yang (2008) conducted a study by revising UTAUT to test

3G mobile telecommunication users, the study showed that facilitating conditions significantly and directly influenced behavioral intention.

The literature review showed that the relationship between facilitating conditions and behavioral intention received very little attention from the researchers in m-commerce field. Moreover, two studies have investigated the relationship and showed a link between the facilitating conditions and behavioral intention in addition to "use behavior" factor as in the UTAUT theory.

(4) The relationship between personal innovativeness in IT and behavioral intention

Personal innovativeness in IT (PIIT) is defined as the enthusiasm of the individuals to try out any new technology. Moreover, PIIT in the m-commerce field has been defined as "Consumers with a high level of innovativeness are expected to be willing to adopt mobile data services and try a wide range of mobile data services" (Yang, 2010, p. 120). Agarwal and Prasad (1998) argued that individuals with higher personal innovativeness are anticipated to build up more positive beliefs regarding technology. Few studies in the domain of m-commerce have investigated the relationship between PIIT and individuals behavioral intention (Aldás-Manzano, Ruiz-Mafé, & Sanz-Blas, 2009; Dai & Palvia, 2009; Jayasingh & Eze, 2010; Lu, et al., 2005; Yang, 2010). The findings from these studies indicated that three studies confirmed the significance of the relationship (Aldás-Manzano, et al., 2009; Dai & Palvia, 2009; Jayasingh & Eze, 2010). Other researchers found the relationship

insignificant (Lu, et al., 2005; Yang, 2010) as shown in Table 2.2. Moreover, after reviewing the literature, it can be concluded that the relationship between PIIT and behavioral intention is highly inconsistent and has received minimal attention from researchers in the domain.

(5) The relationship between cost and behavioral intention

Potential adopters and users typically face a range of hidden "transaction costs" which are expected to impact whether they adopt m-commerce (Koenig-Lewis, et al., 2010). Researchers have found that cost played an important role in the individual level adoption of m-commerce and there was a negative and significant relationship between cost and behavioral intention. Several studies have examined the relationship between the cost and the individual level behavioral intention in m-commerce field (Luarn & Lin, 2005; Shin, 2011; Sripalawat, et al., 2011; Wei, et al., 2009; Wu & Wang, 2005). The findings of the studies indicated that cost is indeed influencing behavioral intention; the higher are the costs, the less likely the individuals will adopt m-commerce. In contrast, another researcher found cost insignificant towards behavioral intention (Koenig-Lewis, et al., 2010; Mallat, Rossi, Tuunainen, & O¨orni, 2008) as shown in Table 2.2. After reviewing the literature, it can be seen that the findings are indeed inconsistent, many of the studies have found a significant relationship between cost and behavioral intention, and others found an insignificant relationship.

Table 2.2: Some of the Previous Studies Investigating the Antecedents of Behavioral Intention

Studies	**Subjects (N)**	**Technologies**	**Theory / Model**	**Proposed Antecedents of Behavioral intention (BI)**	**Findings** ***Significant , **Insignificant**
Lu, Yah and Yu (2005)	American University Students (357)	Wireless internet services via mobile	Extended TAM	Perceived ease of use Perceived usefulness Personal innovativeness Social influence	Perceived ease of use → BI* Perceived usefulness → BI* Personal innovativeness → BI** Social influence → BI**
Lu, Liu, Yu and Wang (2008)	Chinese Individuals (1432)	Wireless mobile data services (WMDS)	Extended TAM	Usefulness Easy of using Social Influences Mobile Trust	Usefulness WMDS → BI* Easy of using WMDS → BI* Social Influences → BI** Mobile Trust (-) → BI*
Wu and Wang (2005)	Taiwanese customers (310)	M-commerce	TAM, IDT and TAM2	Perceived ease of use Perceived usefulness Compatibility Cost Perceived risk	Perceived ease of use → BI* Perceived usefulness → BI* Compatibility → BI* Cost (-) → BI* Perceived risk → BI**

Luarn and Lin (2005)	Taiwanese Individuals (180)	Mobile banking	Extended TAM	Perceived usefulness Perceived ease of Use Perceived Self efficacy Perceived Financial Cost Perceived Credibility	Perceived usefulness → BI* Perceived ease of Use → BI* Perceived Self efficacy → BI* Perceived Financial Cost (-) → BI* Perceived Credibility → BI*
Nysveen et al., (2005b)	Students from Norway (2,038)	Mobile services	TAM and TPB	Perceived usefulness Perceived ease of use Attitude towards use Normative pressure Behavioral control Perceived enjoyment Perceived expressiveness	Perceived usefulness → BI* Perceived ease of use → BI* Attitude towards use → BI* Normative pressure → BI* Behavioral control → BI* Perceived enjoyment → BI* Perceived expressiveness → BI*
Kiseol Yang (2010)	Americans and Koreans respondents (200) each	Mobile data service	Extended TAM	Perceived usefulness Attitude Innovativeness	Perceived usefulness → BI* Attitude → BI* Innovativeness → BI**
Khalifa and Shen (2008b)	Mobile subscribers in Hong Kong (202)	M-commerce	TAM, TPB and IDT	Perceived usefulness Ease-of use Subjective norm Self-efficacy	Perceived usefulness → BI* Ease-of use → BI** Subjective norm → BI** Self-efficacy → BI*
Liu and Chen (2009)	Chinese customers (146)	M-commerce	TAM,TPB and IDT	Perceived ease of use Perceived usefulness Perceived behavioral control Perceived risk Subjective Norm	Perceived ease of use → BI** Perceived usefulness → BI* Perceived behavioral control → BI* Perceived risk → BI** Subjective Norm → BI*

Sripalawat et al. (2011)	M-banking users and non-users in Thailand (200)	M-banking	Extended TAM	Perceived usefulness Ease-of use Subjective norm Self-efficacy Perceived Financial cost Perceived Risk Device Barrier Lack of Information	Perceived usefulness → BI* Ease-of use → BI* Subjective norm → BI* Self-efficacy → BI* Perceived Financial cost (-)→ BI* Perceived Risk (-) → BI* Device Barrier (-)→ BI* Lack of Information (-) → BI*
Zhang and Mao (2008)	Chinese Mobile phone users (262)	SMS advertising	Extended TAM	Perceived usefulness Perceived ease of use Subjective norms Trust	Perceived usefulness → BI* Perceived ease of use → BI* Subjective norms → BI* Trust → BI*
Jayasingh and Eze	Malaysians Responses (824)	Mobile Coupon Adoption	Extended TAM	Attitude Personal innovativeness Compatibility Social influence	Attitude → BI* Personal innovativeness → BI* Compatibility → BI* Social influence → BI*
Koening-Lewis, Palmer and Moll (2010)	Germans young people (263)	Mobile banking	TAM and IDT	Perceived usefulness Perceived ease of use Perceived Costs Compatibility Risk Trust Credibility	Perceived usefulness → BI* Perceived ease of use → BI** Perceived Costs → BI** Compatibility → BI* Risk (-) → BI* Trust → BI** Credibility → BI**
Dai and Palvia (2009)	Students and non-students, (84) USA (106) China	M-commerce	TRA and TAM	Perceived usefulness Perceived ease of Use Perceived value added Innovativeness Perceived cost	Perceived usefulness → BI*(both) Perceived ease of Use → BI, (mixed Results) → BI**(USA), → BI*(China) Perceived value added → BI**(both) Innovativeness → BI* (both)

				Compatibility Perceived enjoyment Subjective norms Privacy Perceptions	Perceived cost → BI, (mixed Results) → BI**(USA), → BI*(China) Compatibility → BI, (mixed Results) → BI*(USA), → BI**(China) Perceived enjoyment → BI, (mixed Results) → BI*(USA), → BI**(China) Subjective norms → BI, (mixed Results) → BI**(USA), → BI*(China) Privacy Perceptions → BI, (mixed Results) → BI*(USA), → BI**(China)
Bhatti, (2007)	University students from UAE (not reported)	M- commerce	TAM, TPB and IDT	Perceived usefulness Ease of use Subjective norms Perceived behavioral control	Perceived usefulness → BI** Ease of use → BI* Subjective norms → BI* Perceived behavioral control → BI*
Mao , Srite, Thatcher, Yaprak (2005)	University Students 130 (Turkey) 143 (USA)	Mobile services	Extended TAM	Perceived usefulness Perceived ease of use Price Accessibility	Perceived usefulness → BI* Perceived ease of use → BI, (mixed Results) → BI**(USA), → BI*(Turkey) Price (-) → BI, (mixed Results) → BI**(USA), → BI*(Turkey) Accessibility → BI**
Kim, Ma and Park (2009)	American College Students (341)	Mobile phones	TAM and TRA	Attitude towards m-commerce Subjective norm	Attitude towards m-commerce → BI* Subjective norm → BI*

Nysveen, et al. (2005a)	Users from Norway (684)	Mobile chat	TAM and TRA	Perceived usefulness Perceived ease of Use Attitude Perceived enjoyment Normative pressure Perceived expressiveness	Perceived usefulness → BI , (mixed Results) → BI*(M), → BI**(F) Perceived ease of Use → BI** (both) Attitude → BI* (both) Perceived enjoyment → BI* (both) Normative pressure → BI, (mixed Results) → BI**(M), → BI*(F) Perceived expressiveness → BI* (both) M: Males , F: Females
Liang and Yeh (2011)	Observations from Taiwan (390)	Mobile services	TAM and TRA	Perceived ease of Use Attitude Playfulness Subjective norms	Perceived ease of Use → BI* Attitude → BI* Playfulness → BI** Subjective norms → BI**
Wei et al. (2009)	Malaysians Respondents (222)	M-commerce	Extended TAM	Perceived usefulness Perceived ease-of use Social influence Perceived cost Trust	Perceived usefulness → BI* Perceived ease-of use → BI** Social influence → BI* Perceived cost (-) → BI* Trust → BI
Shin (2011)	Koreans Individuals (296)	4G Mobile	TAM and IDT	Attitude Social influence Perceived cost	Attitude → BI* Social influence → BI* Perceived cost (-) → BI*
Cheong and Park (2005)	Koreans Individuals (1279)	M-internet	Extended TAM	Perceived usefulness Attitude Perceived playfulness Perceived price level	Perceived usefulness → BI* Attitude → BI* Perceived playfulness → BI* Perceived price level (-) → BI*

Manzano, Mafe ´and Blas (2009)	Spanish mobile users (470)	M-shopping	Extended TAM	Perceived usefulness Attitude Innovativeness Affinity Compatibility	Perceived usefulness → BI* Attitude → BI* Innovativeness → BI* Affinity → BI* Compatibility → BI*
Mallat et al. (2008)	362 Individuals from Finland	Mobile ticketing service	Extended TAM	Perceived usefulness Perceived Ease of use Attitude Social influence Compatibility Cost Risk Trust Prior experience Use context Mobility	Perceived usefulness → BI* Perceived Ease of use → BI* Attitude → BI* Social influence → BI* Compatibility → BI* Cost (-) → BI** Risk → BI* Trust → BI* Prior experience → BI* Use context → BI* Mobility → BI*

2.10.2 Determinants of Attitude

In this study, the researcher will focus in the next sections on the effect of five determinants of attitude as follows: (1) the relationship between perceived usefulness and attitude (2) the relationship between perceived ease of use and attitude (3) the relationship between subjective norm and attitude (4) the relationship between facilitating conditions and attitude and (5) the relationship between cost and attitude.

(1) The relationship between perceived usefulness and attitude

The relationship between perceived usefulness and attitude is confirmed in TAM and DTPB (Davis, 1989; Taylor & Todd, 1995b). Perceived usefulness has significantly positive effects on individual attitudes. In other terms, a consumer who perceives a higher usefulness of m-commerce has a stronger attitude for acceptance (Kuo & Yen, 2009).

Many empirical studies in m-commerce have generally supported the relationship between perceived usefulness and attitude (Aldás-Manzano, et al., 2009; Cheong & Park, 2005; Jayasingh & Eze, 2010; Kim, et al., 2009b; Kuo & Yen, 2009; Li, Fu, & Li, 2007; Liao, Tsou, & Huang, 2007; Liu & Li, 2011; Nysveen, et al., 2005b; Park & Chen, 2007; Raleting & Nel, 2011; Schierz, Schilke, & Wirtz, 2010; Shin, 2009; Shin, 2011; Wessels & Drennan, 2010; Yang, 2005). The results showed that perceived usefulness is significantly and positively influencing attitude. Other

researchers found the relationship in m-commerce studies is insignificant (Chen, Yen, & Chen, 2009; Ha, Yoon, & Choi, 2007) as shown in Table 2.3.

In general, after reviewing the literature of m-commerce, it can be concluded that the relationship is significantly and positively influencing attitude and has a support among the studies although two studies found the relationship insignificant. In addition, the relationship has received a considerable attention from researchers due to the importance of the relationship.

(2) The relationship between perceived ease of use and attitude

Similar to the relationship between perceived usefulness and attitude, the relationship between perceived ease of use and attitude is also confirmed in TAM and DTPB (Davis, 1989; Taylor & Todd, 1995b). In addition, a consumer that perceives a higher ease of use of m-commerce has a stronger attitude for acceptance (Kuo & Yen, 2009). Perceived ease of use is "an individual's assessment of the extent to which interaction with a specific information system or technology is free of mental effort " (Lu, et al., 2005, p. 253).

Numerous empirical studies in m-commerce have generally supported the relationship between perceived ease of use and attitude (Aldás-Manzano, et al., 2009; Cheong & Park, 2005; Jayasingh & Eze, 2010; Kim, et al., 2009b; Kuo & Yen, 2009; Li, et al., 2007; Liao, et al., 2007; Nysveen, et al., 2005b; Park & Chen, 2007; Raleting & Nel, 2011; Schierz, et al., 2010; Shin, 2009; Shin, 2011; Yang, 2010) as

shown in Table 2.3. The findings showed the relationship between perceived ease of use and attitude is significant and positive. However, other researchers found an insignificant relationship (Liang & Yeh, 2011; Liu & Li, 2011; Wessels & Drennan, 2010; Yang, 2005).

Furthermore, after reviewing the literature, the relationship provided support; however, four studies were inconsistent with the above studies. Comparing the two fundamental constructs in TAM regarding the relationship with attitude; perceived usefulness is less inconsistent than perceived ease of use.

(3) The relationship between subjective norms and attitude

Subjective norm is "the degree to which an individual perceives that most people who are important to him think he should or should not use the system" (Venkatesh & Bala, 2008, p. 277). According to Schierz et al. (2010), after reviewing the acceptance of technologies, the social influence of the decision maker should not be ignored and if the social influence (environment) is in support of adopting a technology, this decision will play significant role in the decision process of adoption. In the m-commerce settings, mobile phones and services permit users to move around while maintaining access to services and continue to be socially connected. Potential adopters of mobile technologies are exposed to different social environments in which the user's attitudes and perceptions are affected by the information he/she receives from social environments (López-Nicolás, Molina-Castillo, & Bouwman, 2008).

Very few empirical studies in m-commerce have investigated the relationship between subjective norm and attitude (López-Nicolás, et al., 2008; Schierz, et al., 2010). The findings showed that subjective norm were significantly and positively affected the attitude as shown in past studies in Table 2.3.

After the literature reviewed, it can be concluded that the previous studies established the relationship and proved the significance of the role of subjective norm on attitude. Moreover, indeed the relationship has received considerably less attention from researchers.

(4) The relationship between facilitating conditions and attitude

In this study, after the literature was reviewed, it was evident that the relationship received poor attention from researchers. In addition, from the literature reviewed to this point regarding the relationship between facilitating conditions and attitude in the m-commerce context, there was one study addressed the relationship (Crabbe, Standing, Standing, & Karjaluoto, 2009). The result indicated a significant and positive relationship between facilitating conditions and attitude. In a study regarding mobile banking, researchers argued that "The socio-economic environment, policies, regulations and the legal environment are important conditions for technology acceptance" (Crabbe, et al., 2009, p. 520). The study stated when facilitating conditions are higher; it will develop a more positive attitude.

In other settings such as educational computing , a study conducted by Teo (2009) which investigated the relationship between facilitating conditions and attitude. The researcher found that technical support (facilitating conditions) had a significant and positive result between facilitating conditions and attitude.

(5) The relationship between cost and attitude

The cost of communication, access fees and transactions fees are some of the examples of the essential expenses to deliver m-commerce services. Potential users and users of m-commerce should meet these expenses. If individuals could not meet these expenses, the individuals will not be potential and loyal users (Li, et al., 2007). Few empirical studies have investigated the relationship (Cheong & Park, 2005; Kuo & Yen, 2009; Li, et al., 2007; Wessels & Drennan, 2010) as shown in Table 2.3. The results indicated the relationship is found to be significantly and negatively impacting user's attitude. In other words, the higher cost of m-commerce will lead to a lower adoption rate.

From the literature reviewed, it can be seen that the relationship is consistent in all the studies; however, the relationship in the earlier four studies were conducted in developed countries. Little attention was received from researchers regarding the relationship in developing countries such as the Arab world.

Table 2.3: Some of the Previous Studies Investigating the Antecedents of Attitude

Studies	**Subjects (N)**	**Technologies**	**Theory / Model**	**Proposed Antecedents of Attitude**	**Findings** ***Significant , ** Insignificant**
Yang (2005)	Singaporean students (866)	M-commerce	Extended TAM	Perceived usefulness Perceived ease of use	Perceived usefulness → Attitude* Perceived ease of use → Attitude **
Shin(2009)	Koreans respondents (296)	Mobile wallet	TAM and UTAUT	Perceived ease of use Perceived usefulness	Perceived usefulness → Attitude* Perceived ease of use → Attitude *
Liu and Li (2011)	Chinese students (267)	Mobile gaming	Extended TAM	Perceived ease of use Perceived usefulness Perceived enjoyment Use context Cognitive concentration	Perceived ease of use → Attitude** Perceived usefulness → Attitude* Perceived enjoyment → Attitude* Use context → Attitude* Cognitive concentration → Attitude*
Lopez Nicolas et al. (2008)	Dutch respondents (542)	Advanced mobile services	TAM and IDT	Social influence Perceived status benefits	Social influence → Attitude* Perceived status benefits → Attitude*
Kuo and Yen (2009)	Taiwanese University student (269)	3G mobile services	Extended TAM	Perceived usefulness Perceived ease of use Perceived Cost	Perceived usefulness → Attitude * Perceived ease of use → Attitude * Perceived Cost (-) → Attitude *

Ha,Yoon and Choi (2007)	Koreans Individuals (1011)	Mobile games	Extended TAM	Perceived usefulness Perceived ease of use Perceived enjoyment Flow experience Perceived attractiveness Perceived low sacrifices	Perceived usefulness → Attitude** Perceived ease of use → Attitude* Perceived enjoyment → Attitude* Flow experience → Attitude* Perceived attractiveness → Attitude* Perceived low sacrifices → Attitude**
Chen,Yen and Chen (2009)	Taiwanese Workers (274)	Smart phone service	TAM and IDT	Usefulness Ease of use Compatibility Observability Trialability Task Individual Organization Environment	Usefulness → Attitude** Ease of use → Attitude (Mixed Results) Compatibility → Attitude* Observability → Attitude** Trialability → Attitude* Task → Attitude** Individual → Attitude** Organization → Attitude* Environment → Attitude*
Nysveen et al. (2005b)	Students from Norway (2,038)	Mobile services	TAM and TPB	Perceived usefulness Perceived ease of use Perceived enjoyment Perceived expressiveness	Perceived usefulness → Attitude* Perceived ease of use → Attitude* Perceived enjoyment → Attitude* Perceived expressiveness → Attitude**
Li, Fu and Li (2007)	Chinese Farmers (140)	M-commerce	TAM and IDT	Perceived usefulness Perceived ease of use Personal innovativeness Compatibility Cost Perceived reliability	Perceived usefulness → Attitude* Perceived ease of use → Attitude* Personal innovativeness → Attitude* Compatibility → Attitude* Cost (-) → Attitude* Perceived reliability → Attitude*
Kiseol Yang (2010)	Americans and Koreans (200) each	Mobile data service	Extended TAM	Perceived usefulness Perceived ease of use	Perceived usefulness → Attitude* Perceived ease of use → Attitude*

Liao,Tsou and Huang (2007)	Taiwanese respondents (532)	3G	Extended TAM	Perceived usefulness Perceived ease of use Perceived enjoyment	Perceived usefulness → Attitude* Perceived ease of use → Attitude* Perceived enjoyment → Attitude*
Raleting and Nel (2011)	Non-users of M-banking in South Africa (465)	Mobile banking	Extended TAM	Perceived usefulness Perceived ease of use	Perceived usefulness → Attitude* Perceived ease of use → Attitude*
Jayasingh and Eze	Malaysians respondents (824)	Mobile coupon	Extended TAM	Perceived usefulness Perceived ease of use Coupon proneness Perceived credibility	Perceived usefulness → Attitude* Perceived ease of use → Attitude* Coupon proneness → Attitude* Perceived credibility → Attitude *
Kim, Ma and Park (2009)	Americans College Students (341)	Mobile phones	TAM and TRA	Perceived usefulness Perceived enjoyment	Perceived usefulness → Attitude * Perceived enjoyment→ Attitude *
Nysveen, et al. (2005a)	Users from Norway (684)	Mobile chat services	TAM and TRA	Perceived usefulness Perceived ease of Use Perceived enjoyment Perceived expressiveness	Perceived usefulness → Attitude* Perceived ease of Use → Attitude (F**, M*) Perceived enjoyment → Attitude* Perceived expressiveness →Attitude (F*, M**) F: Females , M: Males
Liang and Yeh (2011)	Observations from Taiwan (390)	Mobile services	TAM and TRA	Ease of Use Playfulness	Ease of Use → Attitude** Playfulness → Attitude*
Shin (2011)	South Koreans individuals (296)	4G mobile	TAM and IDT	Perceived usefulness Perceived ease of Use	Perceived usefulness → Attitude* Perceived ease of Use → Attitude*

Schierz, Schilke and Wirtz (2010)	Germans respondents (1447)	Mobile payment services	Extended TAM	Perceived usefulness Perceived ease of Use Perceived compatibility Subjective norm Perceived security Individual mobility	Perceived usefulness → Attitude* Perceived ease of Use → Attitude* Perceived compatibility → Attitude* Subjective norm → Attitude* Perceived security → Attitude* Individual mobility → Attitude*
Cheong and Park (2005)	South Koreans individuals (1279)	M-internet	Extended TAM	Perceived usefulness Perceived ease of Use Perceived playfulness Perceived price level	Perceived usefulness → Attitude* Perceived ease of Use → Attitude* Perceived playfulness → Attitude* Perceived price level (-) → Attitude*
Wessels and Drenan (2010)	Australians respondents (314)	Mobile phone banking	Extended TAM	Perceived usefulness Perceived ease of Use Cost Perceived risk Compatibility Need for interaction	Perceived usefulness → Attitude* Perceived ease of Use → Attitude** Cost (-) → Attitude* Perceived risk (-) → Attitude* Compatibility → Attitude* Need for interaction → Attitude**
Aldas-Manzano, Mafe and Blas (2009)	Spanish mobile users (470)	M-shopping	Extended TAM	Usefulness Ease of Use	Usefulness → Attitude* Ease of Use → Attitude*
Park and Chen (2007)	American Individuals (132)	Smartphone	TAM and IDT	Perceived usefulness Perceived ease of Use Observability Trialability Individual Organizational	Perceived usefulness → Attitude* Perceived ease of Use → Attitude * Observability → Attitude* Trialability → Attitude** Individual → Attitude** Organizational → Attitude*

2.10.3 Determinants of Perceived Usefulness

The following sections will focus on the effect of four antecedents of perceived usefulness as follows: (1) the relationship between perceived ease of use and perceived usefulness (2) the relationship between subjective norms and perceived usefulness (3) the relationship between facilitating conditions and perceived usefulness and (4) the relationship between PIIT and perceived usefulness.

(1) The relationship between perceived ease of use and perceived usefulness

The relationship between perceived ease of use and perceived usefulness is established and confirmed by Davis in TAM model (Davis, 1989; Davis, et al., 1989). Davis suggested that the higher perceived ease of use will contribute to higher perceived usefulness. In other terms, the improvement in perceived ease of use may lead to an improvement in performance (Lu, et al., 2008).

Empirical supports of the relationship between perceived ease of use and perceived usefulness have taken place in several researches in the m-commerce field (Gu, et al., 2009; Khalifa & Shen, 2008b; Kim, et al., 2009b; Kuo & Yen, 2009; Liu & Chen, 2009; López-Nicolás, et al., 2008; Lu, et al., 2008; Lu, et al., 2005; Raleting & Nel, 2011; Schierz, et al., 2010; Wu & Wang, 2005). The results from the above studies indicated that perceived ease of use is an antecedent of perceived usefulness and it is playing an important role in adopting m-commerce as shown in Table 2.4.

Based on the literature reviewed, it is evident that the relationship between perceived ease of use and perceived usefulness is consistent and has received a large amount of attention from researchers.

(2) The relationship between subjective norms and perceived usefulness

Based on TAM2, subjective norms can influence perceived usefulness through internalization mechanism (Venkatesh & Davis, 2000). According to the same source, internalization is equal to informational social influence which means the "influence to accept information from another as evidence about reality" (Venkatesh & Davis, 2000, p. 189). Furthermore, individuals incorporate important referents' decisions and opinions into their own belief structure, particularly when usage is voluntary (Khalifa & Shen, 2008b; Venkatesh & Davis, 2000). In regard to m-commerce adoption, the adoption and the usage usually process through a voluntary context (Khalifa & Shen, 2008b). Several studies in the m-commerce field have examined and viewed this relationship as one of the most important relationships. Four studies in m-commerce have shown a link between subjective norm and perceived usefulness as one of the antecedents of perceived usefulness (Khalifa & Shen, 2008b; López-Nicolás, et al., 2008; Lu, et al., 2005; Verkasalo, et al., 2010). Others found no significant relationship (Gu, et al., 2009; Kim, et al., 2009b; Lu, et al., 2008) as shown in Table 2.4.

Furthermore, from the literature reviewed, it is clear that the relationship between subjective norm and perceived usefulness is highly inconsistent, because some

researchers found the relationship significant and others found the relationship insignificant. In addition, the relationship has received little attention from researchers.

(3) The relationship between facilitating conditions and perceived usefulness

Very few empirical studies have investigated the effect of facilitating conditions on perceived usefulness (Lu, et al., 2008; Raleting & Nel, 2011). According to Lu et al. (2008) and Raleting and Nel (2011), in studies regarding wireless mobile data services and m-banking, the relationship was tested and it was argued that facilitating conditions could assist consumers in technology utilization. In addition, the researchers expected that facilitating conditions would contribute positively toward the influence of perceived usefulness. The results from the studies indicated the facilitating conditions factor is an important construct influencing usefulness. In a different setting, according to Ngai, Poon and Chan (2007), in a study concerning the examination of the adoption of web course tools (WebCT), they found that facilitating conditions is an antecedents of perceived usefulness.

From the literature reviewed as shown in Table 2.4, it appears that the relationship is significantly and positively influencing perceived usefulness. Moreover, the relationship received poor attention from researchers in the m-commerce field although the facilitating conditions are important in the adoption process.

(4) The relationship between PIIT and perceived usefulness.

Researchers in the technology acceptance field argued that individuals with higher levels of innovativeness in IT could be anticipated to develop positive opinions about the methods in terms of benefits and advantages (perceived usefulness) of the system (Agarwal & Prasad, 1998; Lu, et al., 2005). Furthermore, the majority of potential users with the intention to accept (adopt), do not possess a large amount of information on different mobile data services or have formed obvious perception beliefs (Bhatti, 2007). People that are technology seekers should be more positive in their beliefs regarding the new mobile services (Mao, et al., 2005). It is most likely to observe that personal innovativeness in IT factor will generate a strong influence on perceived usefulness (Agarwal & Prasad, 1998; Lu, et al., 2005).

The relationship proposed by (Agarwal & Prasad, 1998), lead to several studies that have tested the relationship (Bhatti, 2007; Kuo & Yen, 2009; Liu & Chen, 2009; Lu, et al., 2008; Lu, et al., 2005; Mao, et al., 2005). The results have not been consistent. For instance, Lu, et al. (2005) and Liu and Chen (2009) developed different models by extending TAM with PIIT and a various other factors. They found that there was a significant and positive relationship between PIIT and usefulness in wireless internet services via mobile technology and m-commerce context. Other researchers found the relationship is insignificant (Bhatti, 2007; Kuo & Yen, 2009; Lu, et al., 2008; Lu, et al., 2005). In a study conducted by Mao et al. (2005), examining the factors influencing mobile phone services adoption between the USA and Turkey,

they found that PIIT is significantly effecting perceived usefulness in Turkey, but not in the USA, the finding was insignificant.

Bhatti (2007) added three new factors into a research model: personal innovativeness, subjective norms and behavioral control. Personal innovativeness was derived from IDT, and subjective norms and behavioral control were derived from TPB. The purpose of the study was to identify the factors that can predict the intention to use m-commerce systems in United Arab Emirates in a cross sectional survey. The results showed positive relationships between perceived ease of use, subjective norms, and behavioral control toward intention to adopt m-commerce systems. The study also, found that the relationship between personal innovativeness and perceived usefulness was insignificant. The author suggested that practitioners should focus on friends and families who have adopted m-commerce rather than persons with a high degree of personal innovation.

In this study, it can be concluded from the literature reviewed that the relationship is highly inconsistent, because many of the studies found the relationship is either significant or insignificant. Furthermore, PIIT has been receiving little attention from researchers regarding the influence of PIIT on perceived usefulness as one of the major factors in TAM. Table 2.4 showed the past studies and the results of the relationship.

Table 2.4: Some of the Previous Studies Investigating the Antecedents of Perceived Usefulness

Studies	**Subjects (N)**	**Technologies**	**Theory / Model**	**Proposed Antecedents of Perceived usefulness (PU)**	**Findings** ***Significant , **Insignificant**
Wu and Wang (2005)	Taiwanese customers (310)	M-commerce	TAM, IDT and TAM2	Perceived ease of use Compatibility	Perceived ease of use → PU* Compatibility → PU*
Lu et al. (2005)	American University Students(357)	Wireless internet services via mobile	Extended TAM	Perceived ease of use Innovativeness Social influence	Perceived ease of use → PU* Innovativeness → PU* Social influence → PU*
Lopez Nicolas et al. (2008)	Dutch Respondents (542)	Advanced mobile services	TAM and IDT	Perceived ease of use Attitude Perceived status benefits Perceived flexibility benefits Social influence	Perceived ease of use → PU* Attitude → PU* Perceived status benefits → PU** Perceived flexibility benefits → PU* Social influence → PU*
Kuo and Yen (2009)	University students in Taiwan (269)	3G Mobile services	Extended TAM	Personal innovativeness Perceived ease of use	Personal innovativeness → PU** Perceived ease of use → PU*

Gu,Lee and Suh (2009)	Bank customers in Korea (910)	Mobile banking	Extended TAM	Perceived ease of use Social influence Trust System quality	Perceived ease of use → PU* Social influence → PU** Trust → PU* System quality → PU*
Lu, Liu, Yu and Wang (2008)	Chinese Individuals (1432)	Wireless mobile data services (WMDS)	Extended TAM	Easy of using of WMDS PITT Facilitating conditions Social influences Mobile trust WMDS technology	Easy of using WMDS → PU* PITT → PU** Facilitating conditions → PU** Social influences → PU** Mobile trust → PU* WMDS technology → PU
Khalifa and Shen (2008b)	Mobile service subscribers in Hong Kong (202)	M- commerce	TAM, TPB and IDT	Ease of use Subjective norm Cost Convenience Privacy Efficiency Security	Ease-of use → PU* Subjective norm → PU* Cost → PU* Convenience → PU* Privacy → PU* Efficiency → PU* Security → PU*
Liu and Chen(2009)	Chinese customers (146)	M-commerce	TAM,TPB and IDT	Perceived ease of use Personal innovativeness	Perceived ease of use → PU* Personal innovativeness → PU*
Raleting and Nel (2011)	Low-income non-users of M- banking in South Africa (465)	M- banking	Extended TAM	Perceived ease of use Risk Cost Self-efficacy Facilitating conditions	Perceived ease of use → PU* Risk → PU** Cost (-) → PU* Self-efficacy → PU** Facilitating conditions → PU**

Bhatti, (2007)	University students from UAE (not reported)	M- commerce	TAM, TPB and IDT	Subjective norms Personal innovativeness	Subjective norms → PU* Personal innovativeness → PU**
Mao , Srite, Thatcher and Yaprak (2005)	University Students 130 (Turkey) 143 (USA)	Mobile services	Extended TAM	Perceived ease of use Mobile phone efficacy Personal innovativeness	Perceived ease of use → PU* Mobile phone efficacy → PU** Personal innovativeness (mixed Results) → PU** (USA), → PU* (Turkey)
Kim, Ma and Park (2009)	American College Students (341)	Mobile phones	TAM and TRA	Perceived ease of Use Subjective norm	Perceived ease of Use → PU* Subjective norm → PU*
Schierz, Schilke and Wirtz (2010)	Germans Respondents (1447)	Mobile Payment services	Extended TAM	Perceived ease of Use Perceived compatibility Individual mobility	Perceived ease of Use → PU* Perceived compatibility → PU* Individual mobility → PU*
Verkasalo et al., (2010	Finnish smart phone users and non-users (579)	smart phone applications	Extended TAM	Social norms Behavioral control	Social norms → PU* Behavioral control → PU (Mixed results)

2.10.4 Determinants of Perceived Ease of Use

The following paragraphs will focus and discuss the effect of three antecedents of perceived ease of use as follows: (1) the relationship between subjective norms and perceived ease of use (2) the relationship between facilitating conditions and perceived ease of use and (3) the relationship between PIIT and perceived ease of use.

(1) The relationship between subjective norms and perceived ease of use

The potential user's perceptions are influenced by the opinions, decisions, and behaviors the user receives from the social environment (López-Nicolás, et al., 2008). Furthermore, researchers argued that social influences may help to shape the potential user's estimation of the ability to use a system well (Bhatti, 2007; López-Nicolás, et al., 2008; Lu, et al., 2005). Moreover, potential users of m-commerce may believe that accepting the technologies do not involve much effort if the people in their social environment stated that the system is not hard to learn and easy to use (Lu, et al., 2005).

Four empirical studies so far have investigated the significance of the relationship between subjective norm and perceived ease of use in the m-commerce field. Three of the studies have found the relationship is significant and positive (Bhatti, 2007; López-Nicolás, et al., 2008; Lu, et al., 2005). However, one study found the relationship was not significant (Lu, et al., 2008). The results from the relationship in

the past studies are shown in Table 2.5. Moreover, after a review of the literature, it can be seen from the reviewed studies that the relationship has had little attention from researchers in the field of m-commerce. Although potential user's perceptions of ease of use toward adopting m-commerce are significantly attributed by the important people in the social environment; one study has found the relationship insignificant.

(2) The relationship between facilitating conditions and perceived ease of use

As mentioned earlier, facilitating conditions are external environment conditions that assist potential users to overcome obstacles to adopt or to utilize a new system. Researchers argued that users will perceive m-commerce to be easy to use when they know there are external environmental conditions to help them learn how to use the system, even though they cannot use it skillfully (Gu, et al., 2009; Raleting & Nel, 2011). Furthermore, they believe that facilitating conditions will influence perceived ease of use in a positive way.

Very few studies have investigated the role of facilitating conditions and the relationship in m-commerce field (Gu, et al., 2009; Raleting & Nel, 2011). The results indicated that facilitating conditions significantly and positively impact perceived ease of use. However, Lu et al. (2008) conducted a study to examine the determinants of adopting mobile data services, they found that facilitating conditions are insignificantly influencing perceived ease of use as shown in Table 2.5.

After reviewed the literature, the relationship between facilitating conditions and perceived ease of use is inconsistent. Furthermore, the relationship has not received attention from researchers.

(3) The relationship between PIIT and perceived ease of use

Researchers in IS suggested that innovative individuals are significantly and positively effecting beliefs regarding technology (Mao, et al., 2005). Furthermore, those individuals who have higher levels of innovativeness are projected to develop more positive opinions in terms of ease of use (Lu, et al., 2008). Many researchers expected that innovative individuals would have a strong impact on perceived ease of use, which in turn would impact their intention to adopt m-commerce (Bhatti, 2007; Liu & Chen, 2009).

For example, in a study of m-commerce adoption in China, Liu and Chen (2009) added the "personal innovativeness" construct to the research model to investigate the factors of m-commerce adoption of 146 customers in China. The results show that perceived usefulness, perceived behavioral control and subjective norm had a direct relationship on behavioral intention. Personal innovativeness affected users indirectly by influencing perceived ease of use, perceived usefulness, perceived behavioral control and subjective norm, but not perceived risk. Finally, the study found personal innovativeness is an important factor toward behavioral intention to adopt m-commerce.

Several studies have examined the relationship (Kim, Mirusmonov, & Lee, 2010; Kuo & Yen, 2009; Liu & Chen, 2009; Lu, et al., 2008; Lu, et al., 2005; Mao, et al., 2005) as shown in Table 2.5. The findings from the above studies indicated that a positive and significant relationship do exist between PIIT and perceived ease of use. In contrast, in a study by Bhatti (2007) the researcher found that the relationship was insignifcant.

After a review of the literature, several researchers found the relationship significant and positive toward perceived ease of use. However, one study found the relationship insignificant. In general, researchers in m-commerce field have given the relationship a little attention.

Table 2.5: Some of the Previous Studies Investigating the Antecedents of Perceived Ease of Use

Studies	**Subjects (N)**	**Technologies**	**Theory / Model**	**Proposed Antecedents of Perceived ease of use (PEOU)**	**Findings** ***Significant, ****Insignificant**
Lopez Nicolas et al. (2008)	Dutch Respondents (542)	Advanced mobile services.	Extended TAM	Social influence	Social influence → PEOU*
Lu et al. (2005)	American University Students (357)	wireless internet services via mobile	Extended TAM	Personal Innovativeness Social influence	Innovativeness → PEOU* Social influence → PEOU*
Kuo and Yen (2009)	Taiwanese University students(269)	3G Mobile services	Extended TAM	Personal Innovativeness	Personal Innovativeness → PEOU*
Kim, Mirusmonov and Lee (2010)	Koreans Individuals (269)	M-payment	Extended TAM	Innovativeness Mobile payment knowledge Mobility Reachability Compatibility Convenience	Innovativeness → PEOU* Mobile payment knowledge → PEOU* Mobility → PEOU** Reachability → PEOU* Compatibility → PEOU** Convenience → PEOU*

Gu,Lee and Suh(2009)	Koreans bank customers (910)	Mobile banking	Extended TAM	Self-efficacy Facilitating Conditions Familiarity with bank Situational normality	Self-efficacy → PEOU* Facilitating Conditions → PEOU* Familiarity with bank → PEOU** Situational normality → PEOU*
Lu, Liu, Yu and Wang (2008)	Chinese Individuals (1432)	wireless mobile data services (WMDS	Extended TAM	PITT Facilitating conditions Social Influences Mobile Trust WMDS Technology	PITT → PEOU* Facilitating conditions → PEOU** Social Influences → PEOU** Mobile Trust → PEOU* WMDS Technology → PEOU*
Luarn and Lin (2005)	Taiwanese Individuals (180)	Mobile banking	Extended TAM	Perceived Self efficacy	Perceived Self efficacy → PEOU*
sLiu and Chen(2009)	Chinese Customers (146)	M-commerce	TAM,TPB and IDT	Personal innovativeness	Personal innovativeness → PEOU*
Sripalawat et al. (2011)	M-banking users and non-users in Thailand (200)	M-banking	Extended TAM	Self-efficacy	Self-efficacy → PEOU*
Raleting and Nel (2011)	Non-users of m-banking in Soth Africa (465)	Mobile banking	Extended TAM	Self-efficacy Facilitating conditions	Self-efficacy → PEOU* Facilitating conditions → PEOU*

Bhatti, (2007)	University students in UAE (not reported)	M- commerce	TAM, TPB and IDT	Personal innovativeness Subjective norms Perceived behavioral control	Personal innovativeness → PEOU** Subjective norms → PEOU* Perceived behavioral control → PEOU*
Mao , Srite, Thatcher and Yaprak (2005)	University Students (130) Turkey (143) USA	Mobile services	Extended TAM	Personal innovativeness Mobile phone efficacy	Personal innovativeness → PEOU* Mobile phone efficacy → PEOU*

2.10.5 Determinants of Subjective Norms (Decomposing)

Previous studies suggested the decomposition of the subjective norm into relevant referent sources (Ramayah, et al., 2009; Taylor & Todd, 1995a), due to the possibility of divergence of opinions between the diverse referent sources (salient referents). According to Taylor and Todd (1995a), the decomposition approach has many advantages. First, a monolithic belief structure cannot represent a variety of dimensions, thus decomposing is necessary. For example, a monolithic subjective norm may show no relation between subjective norms toward intention due to the canceling out effect between the referent groups (Ramayah, et al., 2009; Taylor & Todd, 1995a). Second, the relationships after decomposing should become clearer and more understood. Third, after decomposition, the stable set of beliefs can be applied to different settings. Four, by pointing to the specific factors, the model becomes more managerially relevant.

Therefore, Taylor and Todd conducted a study that decomposed subjective norm into peer influence and superior's influence (Taylor & Todd, 1995a). Other researchers decomposed subjective norm into interpersonal influence and external (media) influence (Bhattacherjee, 2000). In a recent study by Ramayah and his colleagues, the subjective norm was decomposed into injunctive norm and descriptive norm (Ramayah, et al., 2009) as shown in Table 2.6.

In the m-commerce field, no study has decomposed subjective norms into other dimensions than the above prior studies. For example, Lopez-Nicolas et al. (2008)

surveyed 542 households to test the different determinants of behavioral intention regarding the adoption of the advanced mobile services in the Netherlands. The authors found that media influence is a significant determinant of social influences. Another example, Hong, Thong, Moon and Tam (2008), conducted a survey in Hong Kong regarding the adoption of mobile data services. The researchers decomposed subjective norms into social influence and media influence. Furthermore, it was found that both factors (social influence and media influence) have an impact on intention.

However, conclusions became visible due to the examination of prior studies. First, majority of studies were conducted in developed nations regarding decomposing subjective norms where social norms are not highly compared to the collectivist cultures (with exception to Ramayah and his colleagues, Ramayah, et al., 2009). Second, social influence can be identified by the approval or disapproval of important others only as shown in the previous studies. Third, media influence has been repeated as the only external influence in the previous studies. However, according to Khasawneh (2009), governments in the Arab countries tend to dominate the most of the media outlets. For that reason, people in Jordan and the Arab world do not have trust in the media outlets.

In a study conducted by Straub et al. (2003), regarding the transfer of information technology to the Arab world, it was found that Arab cultural beliefs were strong predictors. Moreover, researchers urged that perhaps, Arab culture is “one of the

more complex cultural and social systems in the world" (p.142). In order to fully understand subjective norms, investigating the antecedents of the construct on many different levels is needed. As mentioned earlier, the m-commerce acceptance rate fluctuates in different cultures (Yang, 2010).The majority of m-commerce research has been conducted in developed countries (Dai & Palvia, 2009; Wei, et al., 2009). In accordance with with Hofstede (2009), Arab nations are collectivist cultures. In addition, Ramayah et al. (2009) argued that, social norms are expected to score higher in collectivist culture and these social norms are expected to play a significant role in adopting or rejecting a new technology (such as m-commerce). Therefore, decomposing subjective norms is greatly valued in collectivist cultures (Ramayah, et al., 2009). Furthermore, according to Park and Smith (2007), subjective norms can be divided into personal and societal norms. The societal norms in technology acceptance are left out of the conceptualization of subjective norms. In this study, the researcher overcome this limitation by broadening the scope of subjective norms construct to include levels of personal norms (injunctive and descriptive) and levels of societal norms (injunctive and descriptive).

Table 2.6: Some of the Previous Studies Decomposing Subjective Norms

Studies	**Subjects (N)**	**Technologies**	**Theory / Model**	**Decomposing Subjective Norm into:**
Taylor et al. (1995a)	Canadian university students (786)	Computer resource center	TAM and TPB	Peer influence Superior influence
Bhattacherjee (2000)	American e-brokerage users (172)	E-commerce	TPB	Interpersonal influence External Influence (Media)
Lopez Nicolas et al. (2008)	Dutch consumers (542)	Mobile services	TAM and IDT	Media influence
Hong et al. (2008)	Hong Kong consumers (811)	Mobile data services	DTPB	Social influence Media influence
Ramayah et al. (2009)	Malaysian customers (144)	Internet stock trading	TRA	Injunctive norm Descriptive norm

2.11 Extended TAM with Proposed Variables in M-commerce Studies

In this section, although the selected relationships were discussed in detail in section 2.10, this section was organized in a different format to provide summarization of the new relationships in m-commerce studies.

Researchers in m-commerce literature have extended the classical TAM by using two approaches. The first approach is adding new variables to the original TAM. The second approach is to identify new variables (antecedents) of perceived ease of use (PEOU) and perceived usefulness (PU). In this study, the term "new variable" refers to a new factor that did not exist in TAM model. However, the new variable has to have an initial theoretical support such as subjective norms based on TRA, or facilitating conditions based on UTAUT.

In this research, the selections of the new variables for analysis are based on the following criteria: new variable commonly used in the m-commerce adoption studies (see Appendix A for the list of the studies for this review); have a theoretical support and TAM was used in the empirical study with empirical support. Based on the above criteria, the selections of the new variables were: subjective norms, perceived behavioral control, facilitating conditions, self-efficacy, image, anxiety, perceived playfulness, perceived enjoyment, compatibility, trialability, observability, personal innovativeness in IT, perceived cost, perceived value, trust and perceived risk which are described in Table 2.7.

2.11.1 Results of the Selected Studies

Through analyzing the studies (see Appendix A), the results in Table 2.8 showed the frequency of the new variables used in the studies. This research focuses on three types of the relationships between the new variables and the TAM classic model. In order to explain the relationships in Table 2.8 more clearly and simply to understand the relationships, a structure was designed as shown in Figure 2.10. The center of the structure is the original TAM and the eleven new variables are placed around the structure.

Image, anxiety, trialability, observability and perceived value were not included in the structure; because these new variables were used infrequently in this review of literature in m-commerce studies.

The structure as shown in Figure 2.10 showed the new variables were used frequently in this literature review, including: subjective norms (SN), perceived behavioral control (PBC), facilitating conditions (FC), self-efficacy (SE), perceived playfulness (PU), perceived enjoyment (PE), compatibility (COM), personal innovativeness in IT (PIIT), perceived cost, trust and perceived risk.

2.11.2 Discussion of the Selected Studies

The next paragraphs will focus on four constructs (subjective norms (SN), facilitating conditions (FC), personal innovativeness in IT (PIIT) and perceived cost)

and their relationships with TAM classic structure. Moreover, the new relationships among the major constructs in TAM will be analyzed.

The relationships between PIIT and PU and PEOU were proposed by Agarwal and Prasad (1998) as they argued that PIIT would generate a strong effect on PU and PEOU. There was a consistent positive and a significant relationship between PIIT and PEOU (P:N:N.S is 7:0:1). First, the positive and significant results marked as (P). Second, the negative and significant results marked as (N). Finally, the non-significant results marked as (N.S).

However, the relationship between PIIT and PU (4:0:4) was highly inconsistent; further research is needed. In addition, the relationship between PIIT and BI is inconsistent (4:0:2). However, the PIIT and attitude relationship has been studied less than PIIT-PEOU, PIIT-PU and PIIT-BI, one study has found a significant relationship between PIIT and attitude.

The relationships between SN and BI is highly inconsistent (13:2:6); the same result can be seen in a meta-analysis by Sun and Zhang (2006). Although SN is an important ‘‘core construct ’’ in several theories (e.g., TRA, TPB, DTPB, TMA2 and TAM3), empirical support findings have been conflicted. SN-PU (7:1:1) and SN-PEOU (3:0:1) relationships are less inconsistent than SN-BI, although SN-PU has been proven by (Venkatesh & Davis, 2000), few researchers in the m-commerce field found the relationship an insignificant. SN-attitude relationship has been studied less and received less attention than other relationships, nevertheless, two studies

found a significant relationship between SN and attitude. Accordingly, the researcher in this study believes that SN is a key construct in TAM extension; therefore further research is needed.

In this review, the relationship between FC and BI is consistent (2:0:0), however, FC-BI relation received minimal attention from researchers although FC is an important "core construct" in UTAUT. Venkatesh & Davis, (2000) argued that FC has an influence on the "use behavior" factor but not on the behavioral intention. Some researchers believe there are relationships between FC-attitude, FC-PU and FC-PEOU. One study has tested the relationship between FC and attitude; the result of the study confirmed a significant and positive relationship. However, FC-PU and FC-PEOU relationships are inconsistent (1:0:1) and (2:0:1) respectively; therefore further research is needed.

Cost is an important variable in the m-commerce field due to the fees of m-commerce services which is a cost to users. Some researchers believe there are relationships between cost-BI, cost-attitude and cost- PU. Results showed that the relationship between cost and BI is highly inconsistent (1:10:6), more research is needed. Cost-attitude and cost- PU relationships are stable and consistent as results showed (0:4:0) and (0:2:0) respectively.

A few interesting conclusions can be made on based on these findings. Large numbers of studies were conducted in developed nations (see Appendix A and Table 2.2, 2.3, 2.4, 2.5 and 2.6). As a consequence, very little is written about the

determinants that influence m-commerce adoption in Jordan or the Arab world. Second, TAM is the "robust model" in the majority of the past studies. Third, regardless of the robustness of TAM in past studies, conflicting findings exist among the relationships for instance, between SN and BI.

Fourth, TPB and IDT theories are considered the second "robust models" that had been used in past studies as shown in Table 2.2, 2.3, 2.4, 2.5 and 2.6. The robustness levels of the factors among the relationships in TPB are different. For instance, the influence of attitude on BI and the influence of SN on BI seem to be more robust than PBC on BI. Fifth, attitude is the least inconsistent core factor in previous studies. Sixth, all studies had been proven statistically.

Table 2.7: Explanation of the New Variables

Variables	**Explanation**	**Theory/Source**
Subjective norm / Social influence	Individual's perception that most people who are important to him/here think he/she should or should not perform the behavior.	TRA,TPB, UTAUT
Perceived behavioral control	The Absence or the presence of the required resources and opportunities.	TPB
Facilitating conditions	The control beliefs concerning to resource issues such as time, money and IT compatibility that may limit usage	UTAUT
Self efficacy	The belief that Individual has the capability to perform a particular job or behavior	DTPB,UTAUT
Image	The innovation is perceived to enhance one's image or status in one's social system	TAM2
Anxiety	Computer anxiety is the fear when he/she is faced with the opportunity of using computers	TAM3
Perceived playfulness	The degree of cognitive spontaneity in microcomputer interactions	TAM3
Perceived enjoyment	The activity of using a particular system is perceived to be enjoyable	TAM3
Compatibility	The degree to which an innovation is perceived as being consistent with the needs, and past experiences and existing values of potential adopters.	IDT
Trialability	The degree to which an innovation may be try out before adoption	IDT
Observability	The degree to which the results of an innovation are observable to others	IDT
Innovativeness (PIIT)	An individual trait reflecting a enthusiasm to try out a new IT	(Agarwal & Prasad, 1998)
Cost	Additional expenses required to perform the service or the transaction.	BDT, (Wu & Wang, 2005)
Perceived value	Services create value for individuals in a different manner than conventional business.	(Dai & Palvia, 2009)
Trust	A belief that vendors are willing to behave based on an individual's expectation.	(Gefen, Karahanna, & Straub, 2003)
Perceived risk	The degrees to which the transactions involve have a certain degree of uncertainty or expectation of suffering a loss.	(Wu & Wang, 2005)

Table 2.8: Frequency of the New Relationships in TAM Extended Studies

New Factor		**PU**	**PEOU**	**Attitude**	**BI**	**Use**
Subjective norm /Social influence	P: Positive	7	3	2	13	
	N: Negative	1			2	
	N.S	1	1		6	
Perceived behavioral control	P: Positive	1	1		2	
	N: Negative					
	N.S	1				
Facilitating conditions	P: Positive	1	2		1	
	N: Negative					
	N.S	1	1			
Self efficacy	P: Positive	1	12		7	
	N: Negative					
	N.S	2			1	
Image	P: Positive					
	N: Negative					
	N.S					
Anxiety	P: Positive					
	N: Negative				1	
	N.S					
Perceived playfulness	P: Positive			2	1	
	N: Negative					
	N.S				1	

Perceived enjoyment	P: Positive	4	1	6	8	1
	N: Negative					
	N.S				6	
Compatibility	P: Positive	6	2	4	11	
	N: Negative					
	N.S			1		
Trialability	P: Positive					
	N: Negative					
	N.S			1		
Observability	P: Positive			1		
	N: Negative					
	N.S			1		
PIIT	P: Positive	4	7	1	4	
	N: Negative					
	N.S	4	1		2	
Cost	P: Positive				1	
	N: Negative	2		4	10	
	N.S				6	
Perceived value	P: Positive					
	N: Negative					
	N.S				1	
Trust	P: Positive	3	1		7	
	N: Negative					
	N.S				1	
Perceived risk	P: Positive				2	
	N: Negative			1	2	
	N.S	1				

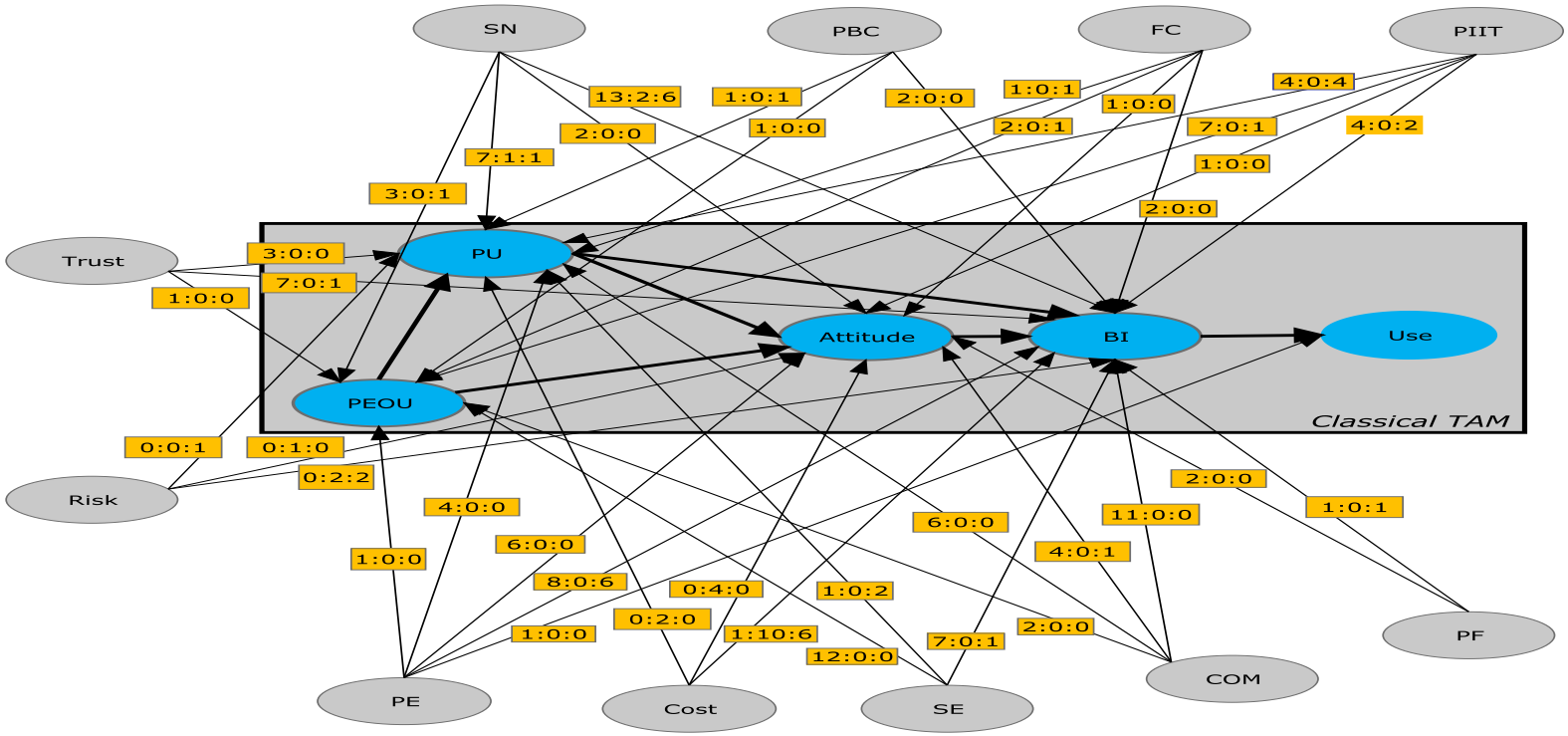

Figure 2.10: Relations between the New Proposed Variables and the Classical TAM Structure
Notes: figure at the left means the number of significant positive relationships; the middle figure means the number of significant negative relationships and the right figure means the number of insignificant relationships.

2.12 Chapter Summary

This chapter presented a review of the existing literature of m-commerce adoption studies and the behavioral intention field. This chapter began with an overview of the targeted country (Jordan) with brief information about ICT and m-commerce in Jordan. Also, an overview of m-commerce (definitions, characteristics of m-commerce and differences between e-commerce and m-commerce) were discussed. In addition, the researcher reviewed the theories and models in technology adoption field in order to identify the most suitable theoretical framework for this study. The researcher reviewed the existing literature of m-commerce adoption studies including their relationships.

CHAPTER THREE
THEORETICAL FRAMEWORK AND HYPOTHESES

The objective of this chapter is to present the theoretical framework of this study, the research model and the development of the hypotheses that was derived from the theoretical framework.

3.1 Research Theoretical Framework

Sekaran & Bougie (2009) refer to the theoretical framework as " beliefs on how certain phenomena (or variables or concepts) are related to each other (a model) and an explanation of why it is believed that these variables are associated with each other (a theory) (p.69). Furthermore, there are three important components for any theoretical framework (Sekaran & Bougie, 2009):

1. The phenomena (or variables) should be clearly defined.

2. The relationships between the variables in the model should be given.

3. Clear explanations should be granted why the expected relationships exist.

The research theoretical framework for this study is based on TAM. TAM is the most appropriate model to explain behavioral intention for many reasons. TAM has been known for its parsimony and explanatory power in IT/IS. In addition, TAM has been

applied in numerous fields in technology acceptance and has strong support. However, although TAM is practically explaining intention, extensions are needed to further examine behavioral intention toward m-commerce usage. This is because the insufficient power of just two constructs (perceived usefulness and perceived ease of use) to explain behavioral intention. Therefore, researchers recommend in order to explain users' adoption in more detail, TAM needs to be extended or integrated with other key constructs in different fields (Gu, et al., 2009).

This study follows two types of approaches. First is to investigate the factors affecting m-commerce acceptance in Jordan. The researcher used an integrative approach by incorporating factors such as subjective norms, cost, personal innovativeness in IT and facilitating condition into the TAM model. In the extended model as shown in the Figure 3.1 (research model), subjective norm could produce a more explanatory model to understand m-commerce adoption in a collectivist culture. Second is to investigate the antecedents of subjective norms. This study used the decomposing approach. Decomposing subjective norms into multi-levels may help in understanding the cause and the effect of the construct in collectivist cultures (with high social norms). Thus, this study decomposed subjective norms into personal injunctive norm, personal descriptive norm, societal injunctive norm and societal descriptive norm. Acknowledging the importance of decomposing, the study is following the previous research approach developed by (Taylor & Todd, 1995b). Both authors argued that decomposing has advantages. First, it provides a clearer relationship between the independent variable (belief structure) and dependent variable (intention) and provides an increased understanding. Second, a

monolithic belief structure cannot represent and explain a multi-dimensional belief structure. Third, decomposing belief structure can point to the specific factor which increases managerial relevance (Taylor & Todd, 1995b). This research has extended the original TAM to examine its impact on behavioral intention. The researcher is proposing a new model including two types of variables:

Endogenous variables: Behavioral intention, attitude, perceived usefulness, perceived ease of use and subjective norms.

Exogenous variables: Cost, personal innovativeness in IT, facilitating condition, personal injunctive norm, personal descriptive norm, societal injunctive norm and societal descriptive norm.

The research framework model for this study has been developed as shown in Figure 3.1. This model showed that behavioral intention is the main endogenous variable. The determinants (antecedents) of behavioral intention are attitude, perceived usefulness, cost, personal innovativeness in IT and facilitating condition. Moreover, the determinants of attitude are perceived usefulness, perceived ease of use, cost, subjective norms and facilitating condition. There are four antecedents of perceived usefulness which are perceived ease of use, subjective norms, personal innovativeness in IT and facilitating conditions. Also, the model shows that the determinants of perceived ease of use are subjective norms, personal innovativeness in IT and facilitating condition. Lastly, there are four antecedents of subjective norms which are personal injunctive norm, personal descriptive norm, societal injunctive norm and societal descriptive norm.

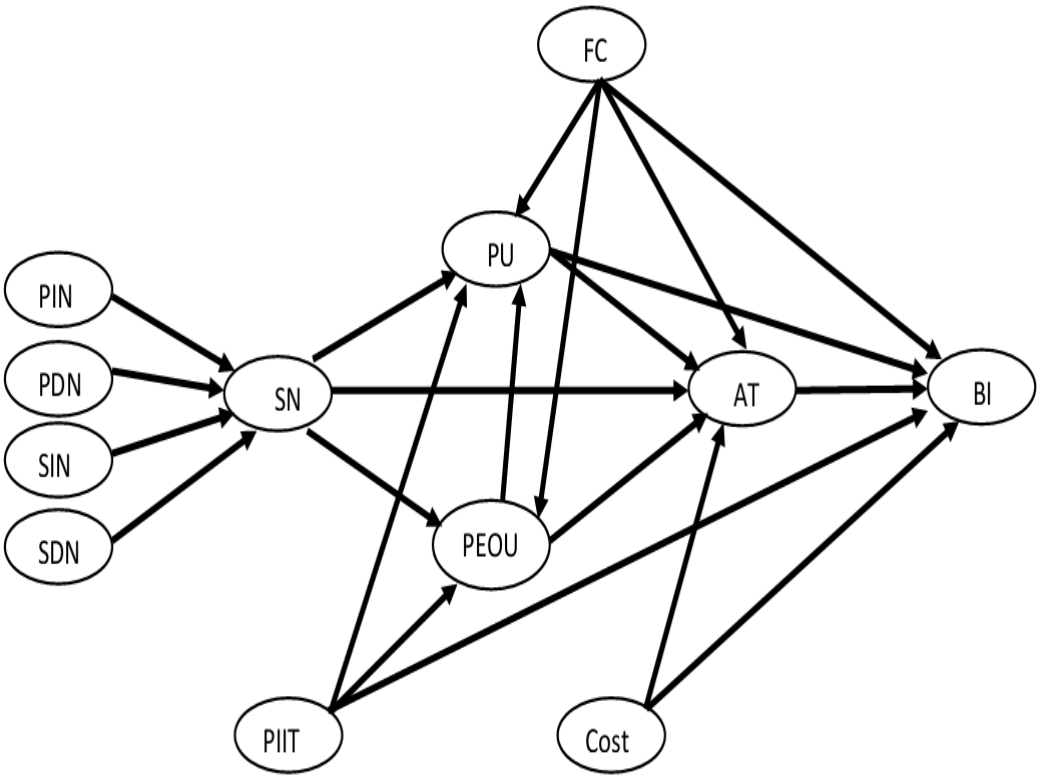

Figure 3.1: Research Model

BI: Behavioral Intention, AT: Attitude, FC: Facilitating Conditions, PU: Perceived Usefulness, PEOU: Perceived ease of Use, PIIT: Personal Innovativeness in Information Technology, SN: Subjective Norm, PIN: Personal Injunctive Norm, PDN: Personal Descriptive Norm, SIN: Societal Injunctive Norm, SDN: Societal Descriptive Norm

3.2 Hypotheses Development

Hypotheses are defined as logical relationships among variables articulated in a form of testable statements (Sekaran & Bougie, 2009). There are twenty one hypotheses formulated in this study. The following sections discuss in detail the hypotheses in the model, which are classified as follows:

3.2.1 The Influence of Subjective Norms

The next subsections will address the impact of subjective norm on (1) attitude, (2) perceived usefulness and (3) perceived ease of use.

(1) Subjective norms ⟶ Attitude

Subjective norms also referred to as social norms or social influences are defined as the social pressure on the users to adopt or not to adopt a technology (Verkasalo, et al., 2010). The TPB, DTPB and TRA, have confirmed the significance of subjective norms in the theories. Fishbein and Ajzen (1975) suggested that the individual's perception is influenced by social environment, which means the people who are important to the users think he/she should approve or disapprove the behavior. In the case of new services such as m-commerce services, particularly in the early stage of development, the majority of the potential users lack reliable (knowledge) information about usage details (Schierz, et al., 2010). Therefore, the significance of the social environment opinions for the potential users' attitude formation increases. López-Nicolás, Molina-Castillo and Bouwman (2008, p. 361) stated that "People's

attitudes, behavior, and perceptions are affected by the information he or she receives from the social environment".

In regard to Jordan, most of the m-commerce services are new products to the users, therefore, the researcher argues that in a high collectivist culture, subjective norm cannot be neglected in formulating users' attitudes. The importance of the role of the subjective norm in affecting the individuals' attitude towards usage has been confirmed in studies such as (López-Nicolás, et al., 2008; Schierz, et al., 2010). Therefore, the thesis proposed the following hypothesis:

H1a: Subjective norm positively influences attitude

(2) Subjective norm ⟶ Perceived usefulness

According to Venkatesh and Davis (2000), subjective norm has a direct influence on perceived usefulness through the internalization mechanism. Internalization refers to the results of "accepting information from expert sources and integrating this information into one's cognitive system" (Karahanna, et al., 1999). Mobile users are often exposed to different social environments (e.g., friends, members, and other important connections). The potential individual adopter of m-commerce incorporates the important referents' opinions, decisions, and behaviors through interactions and communications into their own belief structure, particularly when usage is voluntary (Khalifa & Shen, 2008b). M-commerce is typically voluntary in

usage; therefore, users will perceive m-commerce to be useful when recommendations from the important others in their social connections are received. In the context of m-commerce adoption, researchers found subjective norm significantly and positively influences perceived usefulness (Khalifa & Shen, 2008b; Lu, et al., 2005). Others found no significant influences of subjective norm on perceived usefulness (Gu, et al., 2009; Lu, et al., 2008). In this study, the researcher argues that m-commerce adoption is voluntary and potential adopter of m-commerce are affected by important others due to the high social norms in collectivist cultures. Therefore, the thesis proposes the following hypothesis:

H1b: Subjective norm positively influences perceived usefulness

(3) Subjective norm ⟶ Perceived ease of use

Perceived ease of use is defined as the degree in which a technology is perceived as easy to use and easy to understand (Davis, 1989). Social influences could form the potential users' confidence or the ability to use a technological system (López-Nicolás, et al., 2008). Potential users of m-commerce may feel that adopting the services and technologies does not need much effort if others in their social connections say that the m-commerce is easy to use (López-Nicolás, et al., 2008). If it is believed socially that m-commerce is not easy to learn and difficult to use, it will unavoidably affect on the user's intention toward adopting m-commerce (Lu, et al.,

2005). Studies have proven a positive relationship between subjective norm and perceived ease of use (Bhatti, 2007; López-Nicolás, et al., 2008; Lu, et al., 2005). In this study, the researcher argues that m-commerce adoption is voluntary and potential adopter of m-commerce is affected by important others due to the high social norms in collectivist cultures. Thus, the thesis proposed the following hypothesis:

H1c: Subjective norm positively influences perceived ease of use

3.2.2 Decomposed Subjective Norms

According to Taylor and Todd (1995b), a monolithic subjective norm cannot represent multidimensional factors. Therefore, Taylor and Todd (1995b), decomposed subjective norms into peers influence and superiors influence, while other researchers decomposed subjective norms into family, spouse and friends. Srite, and Karahanna (2006,p. 697) stated that "Social norms need to be conceptualized in a more distinguishing manner to capture the nuances of the social environment". In this study, drawing from the human communication research field, the researcher demonstrated the potential of incorporating multi-dimensional subjective norms by Park and Smith (2007) into IS research by applying the personal injunctive norm, personal descriptive norm, societal injunctive norm and societal descriptive norm factors in the context of m-commerce.

Therefore, in this study, the researcher decomposed subjective norms into personal injunctive norm, personal descriptive norm, societal injunctive norm and societal descriptive norm. According to Ramayah et al. (2009), injunctive norm refers to as others approves or disapproves the behavior while descriptive norm refers to as others performing the behavior. Subjective norm can be divided into two levels: personal and societal. Park and Smith (2007,p. 196) stated "there are actual levels of descriptive and injunctive norms among a certain group and in their society, individuals can vary in their perception of those norms that exist at both the personal and the societal level". In addition, Park and Smith (2007,p. 196) defined personal injunctive norm defined as "individuals' beliefs regarding approval or disapproval of the behavior in question by those valued others" such as family and friends. While, personal descriptive norm is defined as "individuals' beliefs regarding the popularity of the behavior in question among those who are important to the respondent or whose opinion the respondent values" (Park & Smith, 2007,p. 196). On the societal level, the authors stated, "regarding societal-level perceived norms, individuals can differ in their beliefs regarding the popularity and approval level of the behavior in question in their society" (Park & Smith, 2007,p. 196). According to Pavlou and Chai (2002,p. 244), societal norms refer to "adhering to the larger societal fashion (large circle of influence)". In other words, societal norms are the opinions and popularity of behavior within a country or culture (Park & Smith, 2007). Furthermore, the society in collectivist culture has expectations govern by societal injunctive norm and others who performed the behavior govern by societal descriptive norm.

In this study, the researcher believes that subjective norm is an important factor in a collectivist culture such as Jordan. According to Hofstede (2009), Arab countries are collectivist cultures. Social norms are highly valued in collectivist cultures and these social norms can play a major role in adopting or rejecting a new technology (Ramayah, et al., 2009). Arab culture is influenced by strong families and friends, strong tribes' structure of relationships and strong communities. Therefore, several salient referent groups could shape and influence the subjective norms in the Arab culture due to the strong relationships on many levels. Therefore, due to the importance of subjective norms, the decomposition is necessary. Ramayah et al. (2009) conducted a study examining the factors to use internet stock trading in Malaysia. Findings support that descriptive norm and injunctive norms are antecedents of subjective norms. Due to divergence of opinions within the referent groups' in collectivist cultures, the decomposing of subjective norms is very essential. This is the first study to examine personal descriptive norm, personal injunctive norm, societal descriptive norm, and societal injunctive norm in m-commerce context. Therefore, in the view of the above arguments, the following hypotheses are proposed:

H2: Personal injunctive norm positively influences subjective norm
H3: Personal descriptive norm positively influences subjective norm
H4: Societal injunctive norm positively influences subjective norm
H5: Societal descriptive norm positively influences subjective norm

3.2.3 The Influence of Personal Innovativeness in IT

Agarwal and Prasad (1998) proposed the term of personal innovativeness in IT (PIIT) based on the innovation diffusion theory. They defined PIIT as an individual's willingness to try out any new IT innovation. In other terms, it is the level of interest in trying a new (concept, services, products, ideas, or innovation) by individuals that are active information seekers (Rogers, 1983). Moreover, individuals who manage to cope with the high risk of accepting an innovation and boost their intention toward adoption. Agarwal and Prasad argued that individuals with high personal innovativeness generate a positive IT acceptance behavior.

Previous studies found PIIT is an essential construct that influencing acceptance behavior for an innovation (Agarwal & Prasad, 1998; Kim, et al., 2010; Kuo & Yen, 2009; Lu, et al., 2008; Lu, et al., 2005; Yang, 2005). In this study, m-commerce is relatively new in Jordan; the researcher argues that the role of PIIT is important for individuals who are willing to try out any new mobile services in the country. It was empirically tested and has been found that PIIT would influence perceived usefulness (Liu & Chen,2009), perceived ease of use (Kim, et al., 2010) and behavioral intention (Dai & Palvia, 2009). Consequently, it is appropriate to investigate the effect of PIIT on behavioral intention, perceived usefulness and perceived ease of use in Jordan. Thus, the thesis proposes the following hypotheses:

H6a: Personal Innovativeness in IT positively influences behavioral intention
H6b: Personal Innovativeness in IT positively influences Perceived usefulness
H6c: Personal Innovativeness in IT positively influences perceived ease of use

3.2.4 The Influence of Facilitating Conditions

Facilitating conditions are viewed as an external control in the environment (Gu, et al., 2009). Usage (behavior) could not take place if the external control in the environment does not exist. Facilitating conditions consist of two dimensions: resource factors (time and money), and technology factors (technology support) relating to compatibility issues that contain the usage (Lu, et al., 2008; Lu, Yu, Liu, & Yao, 2003). It has been viewed that IT usage will be less likely if less money; less time and less technological support exist. Prior studies have pointed out the significance of facilitating conditions on attitude and behavioral intention (Crabbe, et al., 2009; Saeed, 2011; Van Biljon & Kotzé, 2008). In addition, when individuals feel the availability of resources, the availability of knowledge and the presence of facilitating conditions, it could develop a positive attitude and it is expected to increase the intention. In the view of the above arguments, the following hypotheses are proposed:

H7a: Facilitating Conditions positively influences behavioral intention
H7b: Facilitating Conditions positively influences attitude

In the case of perceived usefulness and perceived ease of use, in this study the researcher believes that individuals perceive m-commerce to be easy to use, and useful when the external environment conditions assisting them in learning how to use m-commerce despite the ability to use it skillfully (Gu, et al., 2009), and discovering the advantages of m-commerce. Studies empirically investigated the relationships and found that facilitating conditions were significantly influenced by perceived usefulness (Lu, et al., 2008), and by perceived ease of use (Gu, et al., 2009). Therefore, the following hypotheses are proposed:

H7c: Facilitating Conditions positively influences perceived usefulness
H7d: Facilitating Conditions positively influences perceived ease of use

3.2.5 The Influence of Cost

Wei et al. (2009,p. 375) referred to the cost as "the extent to which the individual perceives using m-commerce is costly". Cost, price or the financial factor considered one of the most issues in m-commerce adoption from a consumer's

perspective (Wu & Wang, 2005). According to Raleting and Nel (2011), cost was not considered as one of the determinants of TAM model. Since TAM was developed for an organizational context, the actual end-users are different from who is paying for the technology (Raleting & Nel, 2011). However, from the individuals' context perspective, when m-commerce consumers are paying for the services, cost becomes a critical factor that may affect the consumers' behavior. Kuo & Yen (2009) found that perceived fee negatively influenced the user's attitude and behavioral intention toward 3G service adoption. Wei et al. (2009) also found that perceived cost was negatively related to the acceptance of m-commerce. They stated that high prices of subscription and communication fees would lead to the decrease of m-commerce adoption. Considering the above arguments that, the increase of prices for access, transaction fees, subscription fee, roaming fees, and connection fees will have a negative impact on attitude and behavioral intention. Therefore, the following hypotheses are proposed:

H8a: Cost negatively influences behavioral intention
H8b: Cost negatively influences attitude

3.2.6 Determinants of the Classic TAM Structure

The next paragraphs will address the original relationships in TAM as follows: (1) the relationship between attitude and behavioral intention, (2) the relationship

between perceived usefulness and behavioral intention, (3) the relationship between perceived usefulness and attitude, (4) the relationship between perceived ease of use and perceived usefulness and finally (5) the relationship between perceived ease of use and attitude.

(1) Attitude ⟶ Behavioral intention

The central factor in TAM is the individual's behavioral intention to fulfill a given behavior. It is known that "the stronger the intention to engage in a behavior, the more likely should be its performance" (Ajzen, 1991,p. 181). One of the major determinants of behavioral intention is attitude. Attitude in TRA is one of the two main variables that can predict behavioral intention. Moreover, attitude in TRA, TAM and TPB can be either positive or negative. The more favorable (positive) the attitude, the stronger an individual's behavioral intention will be to perform (adopt) the behavior. However, the more unfavorable (negative) the attitude, the weaker an individual's behavioral intention will be to perform (adopt) the behavior. Previous studies have found that attitude significantly influenced behavioral intention and has a direct relationship toward behavioral intention (Ajzen, 1991; Davis, et al., 1989; Fishbein & Ajzen, 1975; Taylor & Todd 1995b). In the domain of m-commerce, researchers have found a direct and a strong relationship of attitude towards behavioral intention (Khalifa & Shen, 2008a; López-Nicolás, et al., 2008; Shin, 2009; Teo & Pok, 2003). Hence, this leads to the following hypothesis:

H9: Attitude positively influences behavioral intention

(2) Perceived usefulness ⟶ Behavioral intention

(3) Perceived usefulness ⟶ Attitude

Perceived usefulness refers to the level to which an individual believes that using a particular system would enhance a person's job performance (Davis, et al., 1989). Davis first introduced perceived usefulness and theoretically has proven it as an important component in TAM (Davis, et al., 1989). In the domain of m-commerce research, the influence of perceived usefulness on behavioral intention is conflicting. Studies such as (Mallat, Rossi, Tuunainen, & Öörni, 2009; Pedersen, 2005) found that perceived usefulness had an insignificant relationship toward behavioral intention. On the other hand, Kim and Garrison (2009), Dai and Palvia (2009), and Wu and Wang (2005) found a link between perceived usefulness and behavioral intention.

M-commerce has many advantages for end-users for instance, performing m-commerce anytime, anywhere, mobility, convenience and reachability. These advantages can establish a positive attitude toward adopting and performing m-commerce. Perceived usefulness in TAM has been confirmed as an antecedent of attitude (Davis, 1989). The influence of perceived usefulness on attitude in the mobile environment has received support (Nysveen, et al., 2005b; Yang, 2005). For this study, the researcher argues that m-commerce has many advantages such as convenience; mobility, 24-h access, anytime, and anywhere access without the limitations of a physical location such as traditional e-commerce. Therefore, this study hypothesized that people that believe these advantages would enhance their

performance are likely to develop a positive attitude and adopt the technology. Thus, the hypotheses are formulated as follows:

H10a: Perceived usefulness positively influences behavioral intention
H10b: Perceived usefulness positively influences attitude

(4) Perceived ease of use ⟶ Perceived usefulness

(5) Perceived ease of use ⟶ Attitude

Perceived ease of use refers to the degree to which an individual believes that using a target system will be free of effort (Davis, 1989). In the m-commerce field, perceived ease of use refers to the degree to which m-commerce would be easy to use and free of mental and physical effort (Wei, et al., 2009). Davis suggested and confirmed that perceived ease of use was an antecedent of perceived usefulness and attitude. Furthermore, Davis (1989, p.334) concluded that, "the easier a system is to interact with, the less effort is needed to operate it and the more effort one can allocate to other activities"; therefore, it would contribute to the overall job performance and establish a positive attitude. In this study, the researcher argues that m-commerce must be easy to learn and easy to use, with less complexity to develop positive attitude and to enhance his\her performance in order to encourage users to adopt m-commerce services .Thus the following hypotheses are:

H11a: Perceived ease of use positively influences Perceived usefulness
H11b: Perceived ease of use positively influences Attitude

3.3 Summary of Hypotheses

The research framework hypotheses have been developed based on the literature review and the research model as shown in Figure 3.1. The following is a list of the research hypotheses that will be tested to empirically validate the proposed research model. Table 3.1 shows the summary of hypotheses used in this study.

Table 3.1: Research Hypotheses List

H No.	Hypotheses
H1 a	Subjective norms positively influences attitude
H1 b	Subjective norms positively influences perceived usefulness
H1 c	Subjective norms positively influences perceived ease of use
H 2	Personal injunctive norm positively influences Subjective norms
H 3	Personal descriptive norm positively influences Subjective norms
H 4	Societal injunctive norm positively influences Subjective norms
H 5	Societal descriptive norms positively influences Subjective norms
H6 a	Personal innovativeness in IT positively influences behavioral intention
H6 b	Personal innovativeness in IT positively influences perceived usefulness
H6 c	Personal innovativeness in IT positively influences perceived ease of use
H7 a	Facilitating condition positively influences behavioral intention
H7 b	Facilitating condition positively influences attitude
H7 c	Facilitating condition positively influences perceived usefulness
H7 d	Facilitating condition positively influences perceived ease of use
H8 a	Cost negatively influences behavioral intention
H8 b	Cost negatively influences attitude
H9	Attitude positively influences behavioral intention
H10 a	Perceived usefulness positively influences behavioral intention
H10 b	Perceived usefulness positively influences attitude
H11 a	Perceived ease of use positively influences perceived usefulness
H11 b	Perceived ease of use positively influences attitude

3.4 Chapter Summary

This chapter presented the theoretical research framework based on TAM as the most appropriate framework for this study. The research model and twenty one hypotheses were presented and developed from prior studies. Finally, a summary of the research hypotheses were listed.

CHAPTER FOUR
RESEARCH METHODOLOGY

This chapter describes the research design and procedures adopted in this research, data screening, study questionnaire, sampling, pilot study, data collection and data analysis. Finally, this chapter wraps up with Structural Equation Modeling (SEM) procedures and justifies using SEM.

4.1 Research Design and Procedures

The research design can be explained as a series of choices to achieve the research objectives with the purpose of answering the research questions and testing the research hypotheses. These choices can envelop the design of the questionnaire, data collection methods, scaling procedures, choice of the sample size and data analysis procedures. An effective high quality research design should be able to justify the decisions that have been taken.

This research uses the quantitative approach research design. It aims to gather data to answer the research questions and to explore the objectives of this study. In this study, quantitative research is defined as a method by collecting data through survey by applying self-administered questionnaire at one specific point in time (cross-sectional study). The researcher chose to employ the cross-sectional-quantitative research approach for several reasons. First, the cross-sectional method was chosen

because this study focused on the measurement of the variables of the proposal model based on individuals' perceptions of m-commerce. By nature, cross-sectional studies provide snap-shot in contrast to a longitudinal study; the main purpose of longitudinal study is the measurement of the differences between individuals' perceptions over two or more periods of time. Second, this research is attitudinal in nature, as the purpose is to measure attitude and behavioral intention to use m-commerce. As a result, a large survey was used to generalize the findings. Third, the quantitative study has high degree of external validity, in other words, the findings can be generalized (Saunders, Lewis, & Thornhill, 2009). Fourth, this is a correlational study; the purpose of the correlational study is the hypotheses testing of the relationships between independent variables (belief structure) and dependent variable (behavioral intention) and provides evidence for or against the relationships in order to understand the phenomena of relationships among existing variables.

Randomization, high structured questionnaire and predetermined responses are the main techniques for the quantitative approach. Moreover, the quantitative approach usually uses a larger sample size than qualitative research. Therefore, for all the above reasons, this study needs to assess the individual's behavioral intention to use m-commerce in Jordan; it is appropriate for this study to employ the quantitative approach.

The sequence of the research approaches are shown in Figure 4.1. This study began by gathering and analyzing m-commerce literature. Conducting the literature review was a fundamental step in the identification of the research problem and the core

constructs in this study. In addition, the literature review was an essential step in the development of the research in terms of theories, research models and issues regarding m-commerce in general and in the Arab world; particularly Jordan. Based on the m-commerce acceptance domain, the researcher has identified the research gap after an intensive collection of theories, models and factors that contributed to the prediction and explanation of behavioral intention in m-commerce. Next, the research model was developed with a range of hypotheses for testing. Then the questionnaire was developed based on various theorized constructs, these theoretical constructs were operationalized by reviewing previous researches and validated items to determine the behavioral intention of m-commerce.

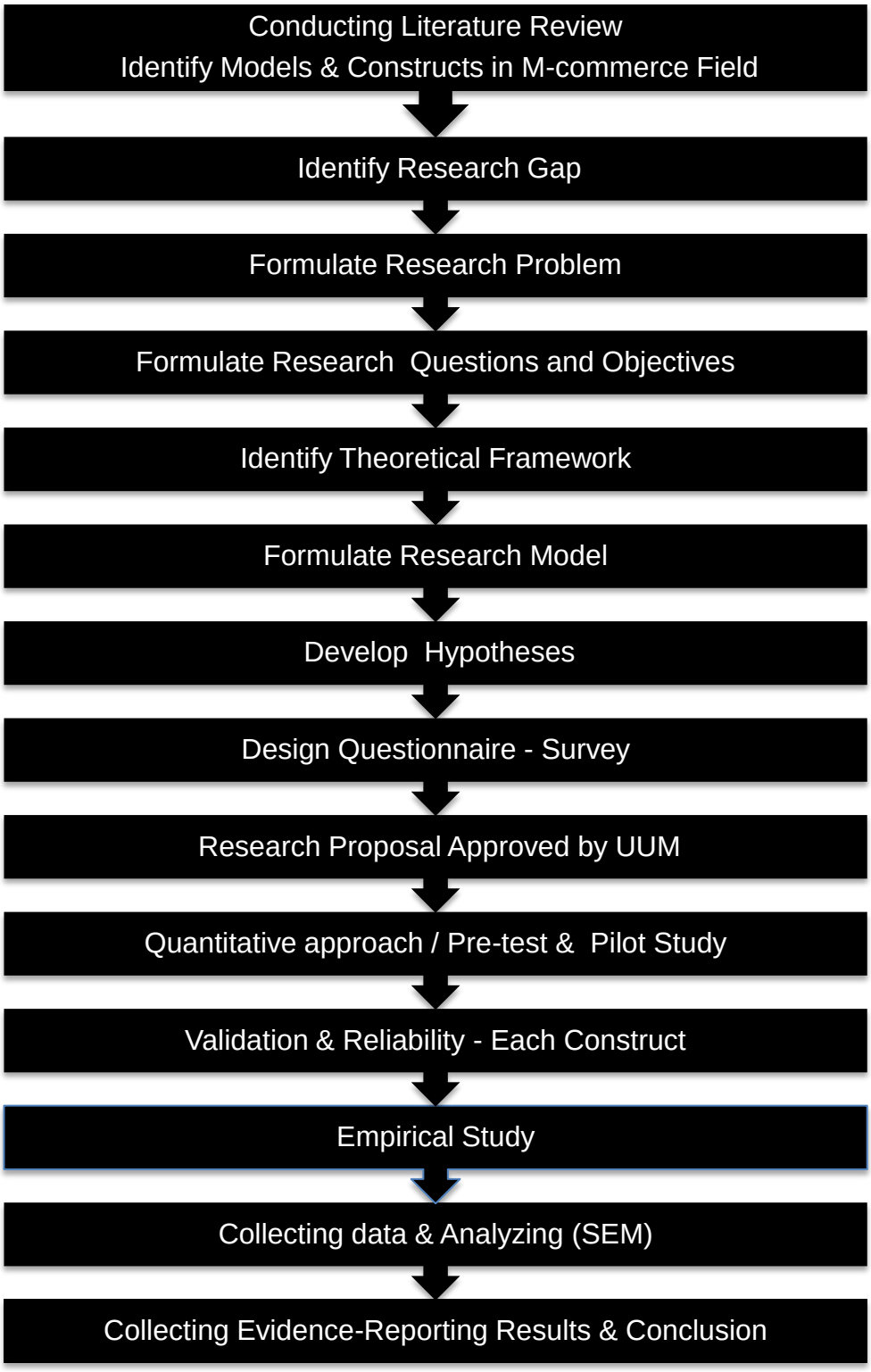

Figure 4.1: Research Approaches

4.2 Research Instrument

This section presents a discussion on instrument (questionnaire) design, variables reliability, research survey translation into the Arabic language and the scale of the questionnaire.

4.2.1 Instrument Design

Identifying the survey method and the process of data collection are essential steps in instrument design. The study's instrument represents the primary data collection technique which is the questionnaire in this research. There are many methods to collect data, including internet survey, mail survey, telephone survey and self-administered survey (face to face).

The selection of self-administered survey, a face to face technique is due to the cost, the time and the personality of the participants of the study. For instance, gathering emails addresses, home phone numbers, and mailing addresses for participants in Jordan were faced with difficulties due to the people might not interested to complete survey and/or technical limitations. Therefore, face to face (self-administered survey) was chosen as the most suitable technique.

In this study, the instrument consists with three parts. Part one consists of the title of the study, opening instructions, short definition of m-commerce with a few examples of m-commerce (due to the new concept of m-commerce in Jordan), confidentiality

statement and the researcher thanking subjects for participating in the survey. Part two of instrument consisted of eleven questions regarding participants' demographic information, including age, gender, level of education (undergraduate or postgraduate), period of internet experience (yearly), period of using internet (daily) and a filtering question such as (Do you have Mobile phone?), if yes please continue to next question, however, If No, please do not continue this survey. Thank you. (see Appendix B).

In addition, the period mobile phone use, awareness of m-commerce, method of payment (prepaid or monthly bill), purchases via mobile phone and expenditures are the remainder of part two of the survey. At the end of page one, was an example of how the participants can answer the items by circling on the suitable answer. Part three of the survey consisted of the variables (40 items) that required investigation (see Appendix B).

4.2.2 Instrument Variables and Reliability

The survey measures twelve variables in this study. Eleven independent variables, which are: attitude, subjective norm, perceived usefulness, perceived ease of use, personal descriptive norm, personal injunctive norm, societal descriptive norm, societal injunctive norm, facilitating conditions, personal innovativeness in IT and cost. However, one dependent variable remains which is behavioral intention.

All items were adopted from previous studies to ensure the reliability and the validity (Mallat, et al., 2009; Ramayah, et al., 2009; Rouibah, et al., 2011; Taylor & Todd, 1995a; Venkatesh & Davis, 2000). The survey items for each construct in this study are aligned with Cronbach's alpha values and the sources are reported in Table 4.1. The survey items were modified to fit the m-commerce context. Independent variables were measured by 37 items and 3 items were measured the dependent variable.

Attitude was measured with three items adopted from Davis et al. (1989) and Taylor & Todd (1995b). The Cronbach's alpha value was 0.84 for both studies. Subjective norms were operationalized with five items from Taylor & Todd (1995b) and Ramayah et al. (2009). The Cronbach's alpha values were 0.88 and 0.94 respectively for subjective norm.

Perceived usefulness was operationalized with five items from Davis et al. (1989) and Ramayah et al. (2009). The Cronbach's alpha values were 0.95 and 0.93 respectively for perceived usefulness. Perceived ease of use was measured with three items derived from Davis et al. (1989) and Ramayah et al. (2009) with Cronbach's alpha values were 0.91 and 0.92 respectively. Personal descriptive norm, personal injunctive norm, societal injunctive norm and societal descriptive norm were measured by three items each adopted from Park & Smith (2007). The Cronbach's alpha values were 0.84, 0.81, 0.87 and 0.87 respectively.

Facilitating conditions factor was measured with three items derived from Venkatesh et al. (2003) and Taylor & Todd (1995a) and Cronbach's alpha values were 0.83 and

0.71 respectively. Personal innovativeness in IT was measured with three items adopted from Lu et al. (2005) and Kim et al. (2010). The Cronbach's alpha values were 0.81 and 0.82 respectively.

Finally, cost was measured by three items adopted from Wu and Wang (2005) and Wei et al. (2009). The Cronbach's alpha values were 0.86 and 0.88 respectively. Finally, the dependent variable (behavioral intention) was measured with three items derived from Davis et al. (1989). The Cronbach's alpha was 0.84. The survey consisted of 40 items measuring the twelve latent variables.

Table 4.1: Survey Items and Reliability

Variable	Code	Questionnaire Items	Source & Reliability
Attitude (AT)	AT1	I feel using m-commerce is a wise idea	Davis et al. (1989) α=0.85, Taylor and Todd (1995b) α=0.85
	AT2	I feel using m-commerce is a good idea	
	AT3	I like to use m-commerce	
Subjective Norm (SN)	SN1	Most people who are important to me would think that using the m-commerce is a good idea	Taylor and Todd (1995b) α=0.88 , Ramayah et al. (2009) α= 0.94
	SN2	Most people who influence my behavior think that I should use m-commerce	
	SN3	Most people who are important to me would think I should use m-commerce	
	SN4	My family who are important to me would think that using m-commerce is a good idea	
	SN5	My family who are important to me would think that I should use m-commerce	
Perceived Usefulness (PU)	PU1	Using m-commerce saves time	Davis et al. (1989) α=0.95 , Ramayah et al. (2009) α= 0.93
	PU2	Using m-commerce can help me to accomplish tasks more quickly	
	PU3	Using m-commerce would improve my performance in my daily life	
	PU4	Using m-commerce would enhance my effectiveness in my daily life	
	PU5	In general, I believe m-commerce will be useful	
Perceived Ease of Use (PEOU)	PEOU1	Learning to use the m-commerce would be easy for me	Davis et al. (1989) α=0.91 , Ramayah et al. (2009) α= 0.92
	PEOU2	It would be easy for me to become skilful at using m-commerce	
	PEOU3	I would find the m-commerce easy to use	
Personal Descriptive Norm (PDN)	PDN1	Most people who are important to me have talked with their family about m-commerce.	Park and Smith (2007) α=0.84
	PDN2	Most people whose opinion I value have talked with their family about m-commerce.	
	PDN3	Most people who are important to me had family discussion about m-commerce.	
Facilitating Conditions (FC)	FC1	I have the resources necessary to use m-commerce	Venkatesh et al. (2003) α= 0.83, Taylor and Todd (1995a) α=0.71
	FC2	I have the knowledge necessary to use m-commerce.	
	FC3	For me, being able to use m-commerce when I need it is important	

Personal Injunctive Norm (PIN)	PIN1	Most people whose opinion I value would approve of my talking with my family about m-commerce.	Park and Smith (2007) α=0.81
	PIN2	Most people who are important to me would endorse my talking with my family about m-commerce.	
	PIN3	Most people who are important to me would support that I express to my family my opinions about m-commerce	
Personal Innovativeness in IT (PIIT)	PIIT1	If I heard about a new information technology, I would look for ways to experiment with it.	Lu et al. (2005) α= 0.82 Kim et al. (2010) α=0.81
	PIIT2	Among my peers, I am usually the first to explore new information technologies	
	PIIT3	I like to experiment with new information technologies	
Societal Injunctive Norm (SIN)	SIN1	A majority of people in Jordan approve of talking with family about m-commerce	Park and Smith (2007) α=0.87
	SIN2	A majority of people in Jordan endorse family discussion about m-commerce	
	SIN3	A majority of people in Jordan support that individuals express to their family their wishes to be m-commerce users	
Cost	C1	I think the equipment cost is expensive for using m-commerce	Wu and Wang (2005) CR= 0.86, Wei et al. (2009) α= 0.88
	C2	I think the access cost is expensive for using m-commerce	
	C3	I think the transaction fee is expensive for using m-commerce	
Societal Descriptive Norm (SDN)	SDN1	A majority of people in Jordan have talked with their family about m-commerce	Park and Smith (2007) α=0.87
	SDN2	A majority of people in Jordan have expressed to their family their wishes to be m-commerce users	
	SDN3	A majority of people in Jordan have engaged in family discussion about m-commerce	
Behavioral Intention (BI)	BI1	Assume that I have access to mobile commerce systems, I intent to use them	Davis et al. (1989) α= 0.84
	BI2	I believe I will use mobile commerce in the future	
	BI3	I believe my interest towards mobile commerce will increase in the future	

4.2.3 Instrument Scale

The 7-point Likert scale was used in the survey. The scale ranges from (1) "strongly disagree" to (7) "strongly agree" with (4) "undecided" as a middle point. According to Sekaran and Bougie (2009), the Likert scale is the most commonly used scale in IT/IS. Moreover, the 7-point Likert scale was used in numerous studies such as (Davis, et al., 1989; Ramayah, et al., 2009). Therefore, the 7-point Likert scale was used in this research as shown in Table 4.2.

Table 4.2: Survey Instrument Scale

1	2	3	4	5	6	7
Strongly Disagree		**Disagree**	**Undecided**	**Agree**		**Strongly Agree**

Source: Adopted from Malhotra and Galletta (1999)

4.2.4 Instrument Translation

Since the survey items were originally in the English language, a translation into the Arabic language was accomplished through expertise in Management Information Systems (MIS) field and in both languages. The survey was translated into the Arabic language then the back translation technique (Arabic to English) was also performed to ensure the accuracy of the original translation (Brislin, 1970). Then, the two translations were compared for accuracy. In view of the translation, slight

modifications were performed to avoid ambiguous terms in the Arabic language. Appendix B represents the survey in English language and Appendix C presents the survey in Arabic language.

4.3 Population and Sampling

4.3.1 Population

The targeted population of this research was university students in Jordan (public and private). The sites for this study were the largest two cities in Jordan, the capital city (Amman) and the second city (Irbid). The reasons for choosing the university students were:

1. The university students have been subject to many studies (Bhatti, 2007; Davis, et al., 1989; Liu & Li, 2011; Lu, et al., 2005; Nysveen, et al., 2005b; Taylor & Todd, 1995b) due to the adoption of technology faster than other groups in the society.

2. Higher educational level and income potential in the future (Yang, 2005).

3. According to Al-Jaghoub & Westrup (2003), educated Jordanians were the first adopters of internet in Jordan, therefore, it is possible that the educated Jordanians are the early potential adopters of m-commerce.

4. In addition, "The younger generation use their mobile phones more frequently than older generation" (Sohn & Kim, 2008, p. 1070).

5. Younger people are sensitive to trends, more easily influenced by technology characteristics and friends or peers' views than non-students or older consumers (Schepers & Wetzels, 2007).

6. Finally, according to Smadi and Al-jawazneh (2011), Jordan has seen a demand for higher education. For instance, between 2000/2001 and 2006/2007 university enrollment increased from 77,841 to 218,900 students. Therefore, the university students have become a hot market segment or popular group for researches.

Therefore, due to the aforementioned reasons, university students were identified as the population for this study. Six universities were selected to conduct the study. The selected universities for this research were reported in Table 4.3.

Table 4.3: Selected Universities for this Study

University Name	**Location**	**Public/ Private**	**Number of Student**	**Number of Faculties**
University of Jordan	Amman	Public	37710	19
Yarmouk University	Irbid	Public	32871	15
Al-Isra Private University	Amman	Private	6444	8
German Jordanian University	Amman	Private	1701	11
Applied Science Private University	Amman	Private	7866	9
Jadara University	Irbid	Private	2083	6
Total			88675	68

Source: Ministry of Higher Education and Scientific Research, MOHE (2010)

4.3.2 Sample Size

The sample is defined as a subset of the population (VanderStoep & Johnson, 2009). One of the statistical rules of thumb is the sample size must represents the population (Sekaran & Bougie, 2009). To ensure that the sample size representing the population in this study, the selection of sample size followed these rules:

According to Saunders, Lewis and Thornhill (2009), researchers usually work with 95 % level of certainty. In other words, the sample size should in no doubt represent the population characteristics. Sample size requires the confidence level (e.g., 95%) and the margin of error (e.g., 5%) to determine the correct sample size, which according to the same source "confidence level states the precision of the estimates of the population as the percentage that is within a certain range or margin of error" (p. 218). Table 4.4 shows different sample sizes at a 95 % level of confidence with different margins of error. According to the Table 4.4, 383-384 is the target sample size for this study based on 95% confidence level and 5% margin of error.

Table 4.4: Determining Sample Size with 95 % Level of Confidence

	Margin of error			
Population	5%	3%	2%	1%
50	44	48	49	50
100	79	91	96	99
150	108	132	141	148
200	132	168	185	196
250	151	203	226	244
300	168	234	267	291
400	196	291	343	384
500	217	340	414	475
750	254	440	571	696
1 000	278	516	706	906
2 000	322	696	1091	1655
5 000	357	879	1622	3288
10 000	370	964	1936	4899
100 000	383	1056	2345	8762
1 000 000	384	1066	2395	9513
10 000 000	384	1067	2400	9595

Source: Adopted from Saunders et al. (2009, p. 219)

In addition, according to Sekaran and Bougie (2009), the sample size is determined by the target population size. In this research, according to the minister of higher education and scientific research in Jordan (MOHE, 2010), the total students enrolled at the Jordanian universities (population size) was around 244,000 in the 2009/2010 academic year. Based on this evidence and the observation in Table 4.5 from Sekaran and Bougie (2009), the targeted sample size for this study is 384 participants.

Table 4.5: Sample Size Determined for Given Population Size

N = Population	**S = Sample size**
10 000	370
15 000	375
20 000	377
30 000	379
40 000	380
50 000	381
100 000	383
100 000>	**384**

Source: Modified from Sekaran and Bougie (2009, p. 296)

The technically acceptable sample size for this research is 384 as a minimum sample size for the population with a 95% confidence level and 5% margin of error. It is essential that the sample size is large enough to provide the researcher necessary confidence with the collected data (Sekaran & Bougie, 2009 ; Saunders, et al., 2009). Consequently, the researcher chose a sample size of 500 students for this study.

4.3.3 Simple Random Sampling Technique

Simple random sampling also known as random sampling was chosen as the most suitable technique. According to Sekaran and Bougie (2009), random sampling offers the most generalizability and the least bias. The procedures of administrating the survey in the chosen universities are as follows: first, getting an approval from the selected universities, and the Dean of the selected faculty. Second, obtain current running classes (schedule) list for the selected faculty. Third, draw names of the classes to be employed randomly. Fourth, contact the lecturers for the final approval. Fifth, visit the selected classes and distributing the surveys randomly. Sixth, collect the returned surveys.

4.4 Pre-test Study

A pre-test study was conducted by two groups; three faculty members in the field of MIS and five university students in Jordan. Comments and suggestions regarding the wordings, translation, clarity, structure and the length of the questionnaire were incorporated into the survey. One of the suggestions was to consider a definition of m-commerce after the title to provide the participants with the idea of m-commerce as a new technology in Jordan. A second suggestion was to provide a range of examples of m-commerce in the daily life of the participants. Modified survey was pre-tested again with five new university students in Jordan. Finally, survey was ready for the pilot study.

4.5 Pilot Study

The term pilot study can refer to a small scale version, feasibility study, or a trial run, which is done in preparation for the main survey. According to Somekh and Lewin (2005), piloting a questionnaire is testing the survey with a number of individuals that are related to the sample to identify crucial issues, highlight ambiguities and to identify potential pitfalls. The reason for pilot study is to assess reliability and establish content validity for the research questionnaire before accomplishing the full-scale survey (Saunders, et al., 2009).

In view of this information, piloting was valuable for this study. The survey was conducted by applying a random sampling technique on university students (representative sample) in Jordan. Thirty six questionnaires were distributed at two universities in Jordan. Two surveys were discarded due to being incomplete. A total of thirty four were valid and usable for data analysis. Participants were asked for comments and suggestions on the survey, but nothing was found.

Furthermore, a data analysis was applied using Statistical Package for Social Science (SPSS) 18.0 software to examine the internal consistency (reliability) of the instrument items (survey variables) by using Cronbach's Alpha Coefficient (α). The Cronbach's Alpha Coefficient for all variables were ranged from 0.65 to 0.94 as shown in Table 4.6. Despite the fact that (Hair, Black, Babin, & Anderson, 2010) suggestion α=0.70 as an acceptable cutoff point, any value more than α=0.60 is regarded as a satisfactory level (Hair, et al., 2010; Sekaran & Bougie, 2009) it was also suggested by previous studies (Chen, et al., 2009; Yang, 2005). Therefore, the

reliability analysis revealed an acceptable level of reliability values and appropriateness for the pilot study.

Table 4.6: Reliability Analysis for Pilot Study

Construct	No. of Items	Pilot Study Cronbach's Alpha Values
Attitude	3	.884
Subjective norms	5	.910
Perceived usefulness	5	.855
Perceived ease of use	3	.799
Personal descriptive norm	3	.940
Facilitating conditions	3	.656
Personal injunctive norm	3	.898
Personal innovativeness in IT	3	.669
Societal injunctive norm	3	.861
Cost	3	.813
Societal descriptive norm	3	.788
Behavioral intention	3	.809

4.6 Data Collection Method

The data collection took place after the survey was pre-tested and piloted. The data collection method was using self-administered questionnaires (survey) provided to undergraduate and graduate students at six targeted universities (see 4.4.1 section for the targeted universities). The survey was conducted from the first week of October 2010 to the first week of November of 2010. Close coordination with deans and faculty members of the schools in the particular universities, improved the

distribution of the survey to the students through direct visits to the particular universities and classes.

4.7 Data Analysis Procedure

In order to analyze data obtained from a quantitative method, preliminary steps (procedures) were required to ensure that the data was complete, correct and appropriate for further analysis (Sekaran & Bougie, 2009). These steps included data entry, data screening and cleaning (missing data and outliers), descriptive statistics, assessment of (linearity, normality and multicollinearity), reliability, exploratory factor analysis and validity testing. The data could then be further analyzed by using the Structural Equation Modeling (SEM) analysis for the overall of the research model, model's goodness of fit and hypothesis testing.

4.8 Data Entry and Screening

After data collections are complete from the participants, the data can be entered, edited and viewed into SPSS 18.0 in the data file. Each row in the data file represents a case or observation (a single participant) and each column represents a variable (a single survey item or a single personal demographic question) (Sekaran & Bougie, 2009). In regard to data screening and cleaning, the purpose of data screening is to ensure the data is clean of ambiguous data and errors. Ambiguous data can have an

effect or negative influence on the outcomes. Therefore, data screening (underlying assumptions-when testing relationship between dependent and independent variables) is an essential an early steps in data preparing for best results. In this study, the following steps were taken for data screening and cleaning.

4.8.1 Missing Data

The first step in data screening is to identify the missing data in the given survey. Missing data refers to the invalid data in which respondents may decline to answer a question in the survey or may not know the answer due to lack of knowledge of the subject (Hair, et al., 2010). Missing data can be handled by many different ways, for example, replacing missing data with a known value (Hair, et al., 2010). Also, another way to handle missing data is to delete the individual case if more than 5% of the data are missing. Finally, the missing data can be replaced with the variable mean (mean substitution) is an additional way to handle it.

4.8.2 Detecting Outliers (Mahalanobis Distance)

Detecting multivariate outliers follow the missing data step. Outliers are cases that scores extreme or derivate observations (farthest scores from the average of the data set); therefore have a great deal of influence on the results of any statistical analysis (Hair, et al., 2010). In order to detect outliers, Mahalanobis distance was applied as a

multivariate outlier's measurement in this study. Mahalanobis distance can be acquired from SPSS 18.0 as well from Analysis of Moments Structures (AMOS) 18.0 program. Each case (observation) was assessed based on the alpha level of $p < 0.001$.

4.9 Descriptive Statistics

Descriptive statistics are the most common method of summarizing data in the research. Descriptive statistics are used to provide brief descriptive information about the collected data in the study, including statistics such as the mean, the standard deviation and frequencies (Sekaran & Bougie, 2009). In the initial steps of data analysis of any given collected data, the researcher usually conducts descriptive statistics to calculate the mean, standard deviation and frequencies of the variables.

4.10 Non-Response Bias Test

Non-Response bias is to test whether the respondents' answers on the survey are different than non-response. Researchers recommended independent sample t-test be preformed when the researcher needs to compare the mean scores on some continuous variable for two diverse groups of subjects. In order to test for non-response bias, respondents can be divided in half (two groups): early respondents and

late respondents. In this study, the researcher made use of t-test to verify if there is a significant difference between early respondents and late respondents.

4.11 Assessment of Linearity and Normality

Saunders et al. (2009) stated that "linearity is the degree to which the change in the dependent variable is related to the change in the independent variables" (p. 462). In other words, linearity is testing the relationships between the predictors (IV) and the outcome variable (DV). If linearity exists, it is represented by a linear line (straight line) between DV and IV. Linearity can be closely examined by observing the straight line through residual plots in SPSS program (Hair, et al., 2010).

Normality refers to when the data is normally distributed for the observed variable. When the data is a bell shaped, it is considered to be normality distributed by examining the data plot histograms and the values of Kurtosis and skewness (Hair, et al., 2010). In this research, it is reasonable to assume normality since the sample size is large enough.

4.12 Assessment of Multicollinearity

Multicollinearity refers to when the predictor variables are strongly correlated among themselves (Myers & Well, 2003). According to Field (2009), multicollinearity existence between predictors variables makes it difficult to evaluate the individual

significance (importance) of a predictor. Field (2009) recommended to diagnose multicollinearity by looking at the variance inflation factor (VIF) and the tolerance values. Hair et al. (2010) suggests below 10 for VIF and over 0.10 for tolerance are acceptable values.

4.13 Reliability and Composite Reliability

Saunders, Lewis and Thornhill (2007) refer to reliability as "the extent to which your data collection techniques or analysis procedures will yield consistent findings" (p.149). In other terms, it is the consistency of measurement. In order to measure the reliability (internal consistency) of the instrument items, reliability analysis is using Cronbach's coefficient alpha for all the dependent and independents variables. Cronbach's alpha value should be more than 0.60 to be acceptable (Hair, et al., 2010; Sekaran & Bougie, 2009).

Composite reliability analysis is the most used procedure in the confirmatory factor analysis. In addition, it is used to measure the internal consistency of the measurement model in SEM analysis. The recommended value for composite reliability should be at least 0.60 (Bagozzi & Yi, 1988; Gu, et al., 2009). Composite reliability is one way to support the existence of convergent validity.

4.14 Exploratory Factor Analysis (EFA)

The exploratory factor analysis is to determine the factor (variable) structure of a measure, reduce variables by grouping them and to inspect its internal reliability. Factor analysis as an exploratory technique is used to find and to analyze common underlying dimensions (factors) within the data (Field, 2009). Principal component analysis is the most frequent method used in factor analysis. According to De Vaus (2002), there are four steps for factor analysis:

1. Selecting the variables to be analyzed.
2. Extracting an initial set of factors.
3. Extracting a final set of factors by 'rotation'.
4. Constructing scales based on the results at step 3 and using these in further analysis.

4.15 Validity Testing

According to Field (2009), validity refers to "whether an instrument measures what it was designed to measure" (p.11). The instrument must first be reliable to be valid; however, the instrument may be reliable but does not have to be valid. In simple terms, reliability is pre-condition for validity instrument (no reliability instrument then no validity instrument). There are four types of validity: face (content) validity, construct validity, convergent validity and discriminant validity.

4.15.1 Face (Content) Validity

According to Sekaran and Bougie (2009), face validity is the minimum and the basic index of content validity. In this study, professional experts in MIS evaluated the survey and the scale items (translation and pre-tested). Some changes were done in the reflection of the expert's feedback, comments and suggestions. Therefore, it can be said that face (content) validity is established after an extensive literature review (all items from previous studies) and reviewed by professional experts in MIS.

4.15.2 Construct (Convergent and Discriminant) Validity

De Vaus (2002) stated that construct validity is " the evaluation of the validity of a measure by comparing results using that measure with the results expected on the basis of theory" (p.357). In other terms, the researcher should verify the construct validity and ask the following question: "does the instrument tap the concept as theorized?" (Sekaran & Bougie, 2009, p. 160). The construct validity is explored by examining its connection with other constructs; through assessment of (1) the convergent validity (both related) and (2) the discriminant validity (unrelated) (Pallant, 2011) which are explained below:

1. ***Convergent Validity:*** to establish convergent validity, two or more different measurement scales are supposed to measure the same concept (highly correlated) and the "factor loading estimates" are a useful start in evaluating the convergent validity (Hair, et al., 2010). According the same source, the factor

loading value should be at least 0.50 for each item. In this study, the convergent validity can be investigated through SEM (confirmatory factor analysis by using AMOS).

2. ***Discriminant Validity:*** is established when a measurement scale is different (distinct) from other measurement scale (not correlated) to the measurement of the same construct. According to Hair et al. (2010), the researcher should compare the Average Variance Exteracted (AVE) for each factor with the squared correlation associated with that factor, and when AVE is greater than squared correlation then discriminant validity is established. According to the same source, the AVE value should be at least 0.50 for each factor (construct).

4.16 Structural Equation Modeling (SEM)

According to Byrne (2010), SEM is "a statistical methodology that takes a confirmatory (i.e., hypothesis-testing) approach to the analysis of a structural theory bearing on some phenomenon" (p.3). SEM is known by different names: causal modeling, latent variables analysis, causal analysis, analysis of covariance structures, simultaneous equation modeling, Confirmatory Factor Analysis (CFA) or path analysis (Hair, et al., 2010; Tabachnick & Fidell, 2007). The last two names are the most frequently used names. When combining the two multivariate techniques: multiple regression analysis and factor analysis simultaneously, SEM is the outcome (Tabachnick & Fidell, 2007). In other terms, the hypothesized model can be

investigated in a simultaneous analysis of the entire constructs (endogenous and exogenous) to find the degree to which it is consistent with the collected data.

Moreover, according to Hair et al. (2010), SEM has three distinguished characteristics: (1) It can estimate multiple and interrelated dependence relationships. (2) Explaining the entire set of relationships in a proposed model. (3) The capability to account for unobserved and measurement error in the relationships.

The procedure for testing SEM involves the measurement model and the structural model respectively. The measurement model was developed based on a theory and then tested with CFA. These test include factor loadings, model's overall fit and evident of construct validity for each individual measure. On the other hand, the structural model defines relations between unobserved variables by specifies the way which latent variables directly or indirectly influence (i.e., cause) changes in the other unobserved (latent) variables in the model (Byrne, 2010). SEM presents a better way of empirically investigating a theoretical model by combining the measurement model and the structural model in one analysis (Hair, et al., 2010).

4.16.1 Why SEM?

SEM is similar to the multiple regression techniques, but in a more powerful approach (Hair, et al., 2010). The justifications for using SEM are:

1. Data analysis using EFA are based on observed measurements only; SEM procedures are integrating both unobserved (latent) and observed variables (Byrne, 2010).

2. Basic statistical procedures are incapable of either evaluating or correcting the measurement error; SEM techniques clearly take measurement error into account in the statistical procedures (Raykov & Marcoulides, 2006).

3. As mentioned earlier, SEM can estimate casual relationships between multiple variables simultaneously.

4. SEM gives a greater recognition to the validity and the reliability of the measurement instruments (Schumacker & Lomax, 2004).

5. SEM enables researchers to develop, estimate, and analyze complex multivariable relationships, as well as to estimate both direct and indirect effects of constructs that are taking role in a given model (Raykov & Marcoulides, 2006).

6. SEM procedures involve overall assessment of fit (goodness of fit measurements) for the proposal model.

Therefore, for the above mentioned reasons, in order to test the proposed model, a confirmatory factor analysis is used for this study. In addition, a transition from the measurement model to the structural model for path analysis testing is required.

4.16.2 Confirmatory Factor Analysis (CFA)

As mentioned before, SEM is divided into two models: validating the measurement model that is achieved by CFA, and fitting the structural model by path analysis with latent variables. CFA is defined as a type of SEM that deals particularly with the measurement model, and the relationships among observed measures or indicators (e.g., survey items) and latent variables (Brown, 2006). The purpose of CFA is to enable researchers "to test how well the measured variables represent the constructs" (Hair, et al., 2010, p. 659). Validity for each construct should be tested and assessed by factors loadings, convergent validity, composite reliability, and discriminant validity as well.

According to Hair et al.(2010), factor loadings or "standardized regression weights" as in AMOS software terminology should be at least 0.50 for each item. Moreover, the composite reliability estimates should be 0.60 as a minimum value and the discriminant validity estimates by AVE should exceed 0.50.

In addition to validity, the overall model fit must be examined with a range of goodness of fit indices. Including Chi-square (χ^2), absolute fit measures, incremental fit indices and parsimony fit indices. The subsection (4.16.5) is explaining the goodness of fit statistics in more detail.

4.16.3 SEM Process

SEM uses a confirmatory approach rather than an exploratory approach. In general, SEM is used to confirm (testing) a model rather than discovering a new model (Hair, et al., 2010). To confirm a model, SEM involved in constructed hypothesis (based on theory) which is the basic concept of the relationships between measured indicators (items) and latent variables. In this phase, referred to as model conceptualization, a model is developed based on theory and empirical results. Then the path diagram is developed in the light of the model conceptualization.

Furthermore, according to Schumacker and Lomax (2004) , there are five logical sequences (processes) in building blocks for SEM analysis: (1) model specification, (2) model identification, (3) model estimation, (4) model testing and (5) model modification.

In the first process, the goal for model specification is "to determine the best possible model that generates the sample covariance matrix" (Schumacker & Lomax, 2004, p. 62). In other words, model specification (generating model) deals with determining all relationships and parameters in the model.

The second process is model identification in which sufficient parameters in the model are identified. According to Byrne (2010), "In broad terms, the issue of identification focuses on whether or not there is a unique set of parameters consistent with the data" (p.33). There are three levels of model identification: under

identified, just identified and over identified. The aim of SEM is to specify a model and to meet the level of over-identification (Byrne, 2010).

The third process is model estimation. This step refers to parameter estimation by using the most frequently used estimation model which is Maximum Likelihood (ML). The purpose of model estimation is to obtain estimation for each of the parameters specified in the model and to have estimated (model) covariance matrix equal with the original (observed) sample covariance matrix.

The fourth process is model testing (fit testing). The purpose of this step is to assess the degree of fit (goodness of fit) between the data collected and the proposed model. According to Hair et al. (2010), models that generate an estimated (model) covariance matrix that is within the sampling variation of the observed (original) covariance matrix are considered as good models and would be said to fit well. Goodness of fit statistics are used as part of the confirmatory analysis and part of the measurement model validation.

A final process in SEM is to make changes when a specified model has poor model fit indices; the researcher usually performs re-specifications by using for example modification indices (MI) in AMOS. Model modification normally takes place when researchers discover that the fit of the specified model is less than appropriate. According to Hair et al. (2010), the purpose of model re-specification is to improve model fit, rather than searching for relationships. Any re-specification has to have strong theoretical based and empirical support to be acceptable.

4.16.4 Research Model Specification

In this study, as exhibited in Figure 4.2, the research model has twelve constructs that represent different types of variables. SEM has two types of variables: latent (unobserved) and observed (indicators or items). In this study, the latent variables are: behavioral intention (BI), attitude (AT), facilitating conditions (FC), perceived usefulness (PU), perceived ease of use (PEOU), cost, personal innovativeness in information technology (PIIT), subjective norm (SN), personal injunctive norm (PIN), personal descriptive norm (PDN), societal injunctive norm (SIN) and societal descriptive norm (SDN). Moreover, latent variables are observed or measured directly by the indicators (observed instruments items).

The latent variables can be divided into: exogenous and endogenous latent variables. Exogenous variables are "synonymous with independent variables; they "cause" fluctuations in the values of other latent variables in the model" (Byrne, 2010, p. 5); such as facilitating conditions (FC), cost, personal innovativeness in information technology (PIIT), personal injunctive norm (PIN), personal descriptive norm (PDN), societal injunctive norm (SIN) and societal descriptive norm (SDN). Endogenous latent variables are influenced by the exogenous latent variables in the model such as behavioral intention (BI), attitude (AT), perceived usefulness (PU), perceived ease of use (PEOU) and subjective norm (SN).

According to Byrne (2010), four geometric symbols used in SEM, a circle (or ellipse) represents unobserved construct, a square (or rectangle) represent observed construct, a single-headed arrow represents the impact of one construct on another

construct, and a double-headed arrow represents co-variances or correlations between pairs of constructs. For simplicity, a double-headed arrow between exogenous have been left off in this model in Figure 4.2. Finally, measurement error and error for each item is represented by a circle (shown as an *e*) such as *e1*.

The proposed theoretical model (as in Figure 3.1 in Chapter 3), was transformed into the hypothesized model of SEM which is showing the measurement models and structural model. The measurement model(s) were marked such as A,B,C,D,E,F,G,H,I,J,K and L. On the other hand, the structural path model is constructed theoretically by linking all latent variables (exogenous and endogenous) in the model as shown in bold dotted box. For example, the relationship between Attitude (AT) and Behavioral Intention (BI) is called a structural model that is theoretically linked by a hypothesis (Hair, et al., 2010).

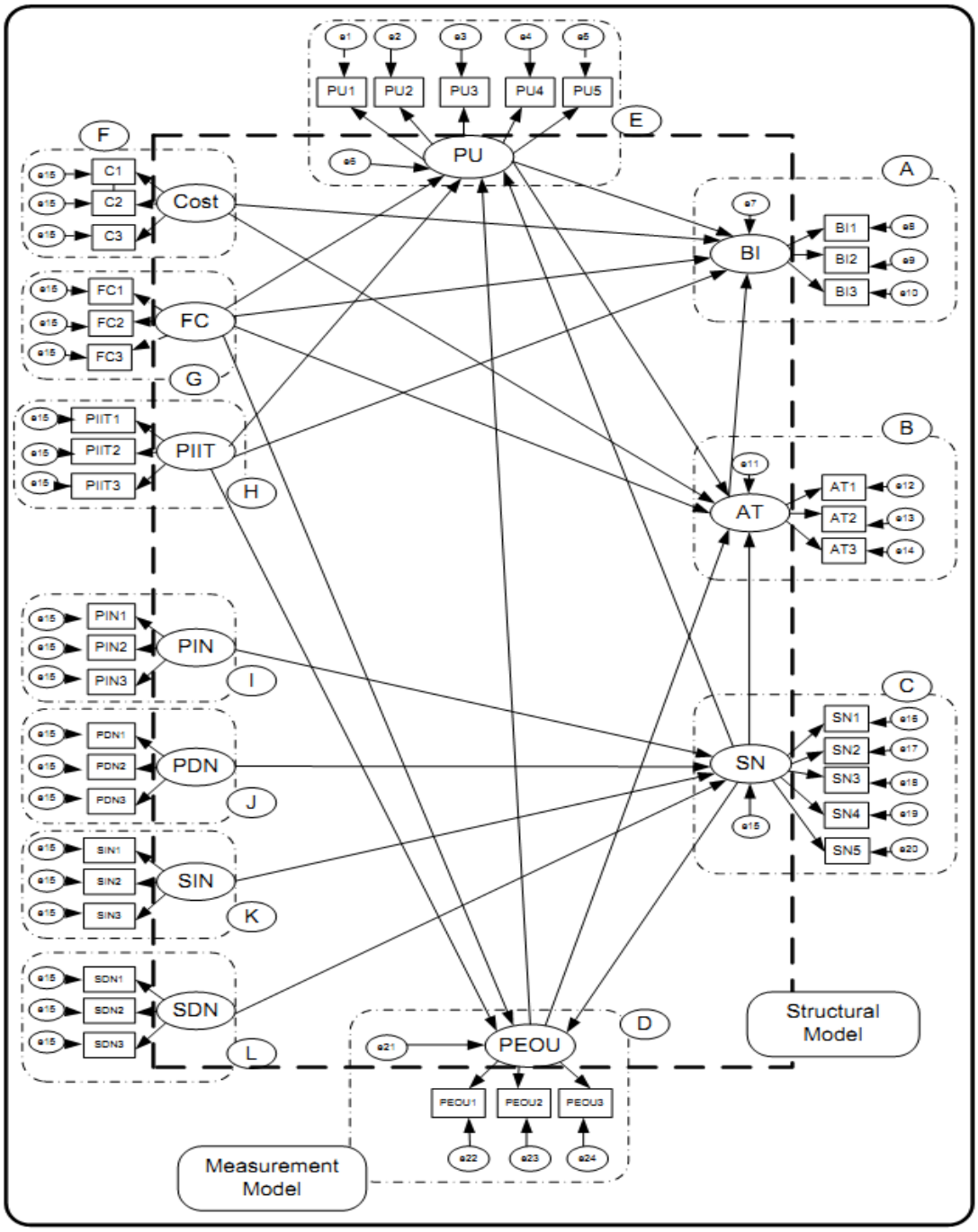

Figure 4.2: Research Hypothesized Model Specifications in SEM

4.16.5 Goodness of Fit Criteria

There are several goodness of fit indices and most SEM researchers recommend assessing the research model by examining more than one of the goodness-of-fit indices (Byrne, 2010; Hair, et al., 2010). Moreover, Hair et al. (2010) characterized goodness of fit indices into: absolute fit measures, incremental fit indices and parsimony fit indices. Hair et al. (2010) and Brown (2006) suggested that the rule of thumb is to rely on at least one absolute fit measure, one incremental fit index and one parsimony fit index, beside the χ^2 results. In this study, a variety of goodness of fit indices were examined as shown in Table 4.7.

Before starting with the goodness of fit indices types, the chi-square (χ^2) is the most general method of assessing goodness of fit indices, the lower of the chi-square (χ^2) and the higher the p-value more than 0.05, the better fit of the model. However, there is a limitation for testing the chi-square (χ^2) and the p-value. The chi-square (χ^2) and the p-value are very sensitive to sample size (Byrne, 2010; Hair, et al., 2010). Therefore, SEM researchers recommended that is necessary to evaluate multiple measures to support goodness of fit indices as follows:

First, the absolute fit catalog evaluates the model fit at an absolute level (Brown, 2006). Absolute fit indices such as the ratio (χ^2/df), the Root Mean Square Error of Approximation (RMSEA), Goodness of fit index (GFI) and the closeness of fit (PCLOSE) were used.

Table 4.7: Goodness of Fit Indices and Recommended Values

Fit Measures	*Recommended values*
χ^2 **(Chi-square)**	--
Df (Degree of Freedom)	--
P-value	Greater than .05
Ratio (χ^2 /df)	Less than 3.0 (Good) ; less than 2.0 (Excellent)
RMSEA	Less than 0.08 (Good) ; less than 0.05 (Excellent)
GFI	Greater than 0.90
PCLOSE	Greater than 0.50
CFI	Greater than 0.90
AGFI	Greater than 0.80
TLI	Greater than 0.90
IFI	Greater than 0.90

Source: Hair et al.(2010)

In AMOS 18.0 software terminology, CMIN (minimum discrepancy) refers to as (χ^2), DF (degrees of freedom), P (p-value), and CMIN/DF as the ratio (χ^2/df) (Byrne, 2010). Moreover, the ratio (χ^2/df) can be calculate by dividing the chi-square (χ^2) on the degree of freedom, the smaller the ratio value is, the superior the fit will be. The ratio (χ^2/df) should be equal or smaller than 2.0 (very good) and any value between 2.0 and 5.0 is acceptable (Hair, et al., 2010). On the other hand, RMSEA is the measurement of discrepancy per DF. The value of RMSEA should be equal or smaller than 0.08, to be considered acceptable and equal or less than 0.05 is considered to be an excellent fit (Byrne, 2010; Hair, et al., 2010). In addition, RMSEA is one of the most frequently reported indices (Tabachnick & Fidell, 2007). The closeness of fit (PCLOSE) test is associated with RMSEA, the probability value related with closeness of fit test should be equal or greater than 0.50 to be a good fit (Byrne, 2010). In addition, Goodness of fit index (GFI) should be equal or greater than 0.90.

Second, the incremental fit indices or as it called comparative fit indices is assessing the fit in light of a more restricted model (null model) and assume all covariance are fixed to zero. One of the commonly used indices is: Comparative Fit Index (CFI) as the most widely used index (Hair, et al., 2010). The acceptable value should be equal or greater than 0.90. The Adjusted Tucker Lewis Index (TLI) is another test and the value should be equal or greater than 0.90 and Incremental Fit Index (IFI) is an additional test and the value should be equal or greater than 0.90 (Hair, et al., 2010).

Third, the parsimony fit indices related to "the number of estimated parameters required to achieve a specific level of fit" (Schumacker & Lomax, 2004, p. 104). In simple terms, an over identified model is matched with a restricted model. One of the parsimony fit indices that is commonly used is: Adjusted Goodness of Fit Index (AGFI) and should be equal or greater than 0.80 (Chau & Hu, 2001).

4.16.6 Hypothesis Testing in SEM

According to Hair et al. (2010), the difference between the measurement model and structural model are: (1) CFA model emphasis moves from the latent constructs and their measured indicators to the relationships and the magnitude between constructs, (2) in the CFA model, the exogenous and the endogenous variables are not distinguished, but in the structural model the exogenous (predictors) and the endogenous (outcome) are identified, (3) in the CFA model, all the constructs are related to each other, but in the structural model the correlation relationships are

replaced with dependence relationships (theoretical) with either direct or indirect effects.

After the measurement model is tested, inspected and validated by using CFA analysis, the focus in the SEM shifts toward the structural model to test the structural relationships (testing hypothesis) in the model. Hypothesis testing is recommended after assessing the structural model overall fit and the constructs validity (Hair, et al., 2010).

4.17 Chapter Summary

This chapter discussed the research design, based on the quantitative approach by using the structured questionnaire. Moreover, this chapter discussed the research instrument design, development, pre-test and pilot study. In addition, the chapter dealt with population, minimum sample size needed, random technique, data collection procedures, data analysis including data screening, reliability and different types of validation. The chapter concludes with the SEM analysis examination for this study.

CHAPTER FIVE
RESEARCH ANALYSIS AND RESULTS

This chapter presents the findings of the study that obtained from the quantitative analysis. The analysis includes response rate and data screening that includes missing data and outliers. In addition, assessment of linearity, normality and multicollinearity were conducted. Also, profiles of the respondents, descriptive statistics and testing of non-respondent's bias were preformed. These steps were followed by the reliability test and the exploratory factor analysis. It concludes with SEM analysis that includes constructs validity test, measurement model, structure model, goodness of fit and hypothesis testing.

5.1 Overall Response Rate

A total of 500 questionnaires were distributed equally to the six universities (83 questionnaires for each university, with the exception of the University of Jordan and the Jadara University, 84 each) in Amman and Irbid cities for data collection purpose. A total of 448 questionnaires were returned representing a response rate of 89.6 %. The remaining 52 questionnaires were not completed. Table 5.1 shows the information regarding returned questionnaires and response rates for each university.

Table 5.1: Response Rate

University Name	Total Distributed Survey	Total Completed Survey	Total Incompleted	Response Rate
University of Jordan	84	77	7	92 %
Yarmouk University	83	72	11	87 %
Al-Isra Private University	83	80	3	96 %
German Jordanian University	83	70	13	84 %
Applied Science Private University	83	75	8	90 %
Jadara University	84	74	10	88 %
Total	500	448	52	89.6 %

5.2 Data Screening

In order to make sure that the data have been correctly entered, visual inspection was conducted for errors. Also, data screening and cleaning procedures were conducted to address missing data and outliers. The following sections will discuss these procedures.

5.2.1 Missing Data

Missing data occurs when the respondents decline to answer one or more question. This happens due to the respondents' lack of knowledge regarding to the subject. Others had no interest in the m-commerce, or the length of the questionnaire could have led to the missing data.

The collected data was inspected for missing data and action was taken according to the type of missing data (Hair, et al., 2010). There are two types of missing. The first type of missing data is to exam the number of observations (cases) that had missing data for each item. One item (FC3) had missing data (left blank) for more than 15 % of the cases. Therefore, the item was removed (Hair, et al., 2010). No logical explanation could be concluded as to why the item had missing data. The second type of missing data is to exam the number of items that had missing data for each case. There were 36 cases that were excluded due to missing data, invalid data, incorrect and incomplete section(s). Therefore, the remaining number of cases 412 (448 - 36) were utilized for further inspection which represented 82.4 % of 500 distributed questionnaires.

5.2.2 Assessments of Outliers, Linearity and Normality

The dataset was examined for outliers, linearity and normality. Outliers occur due to the extreme responses, for example, when the questions were responded to either "strongly disagree" or "strongly agree". The Mahalanobis Distance (D^2) was employed to identify outliers. Mahalanobis Distance is the distance between a case and the centroid of the remaining cases (Tabachnick & Fidell, 2007). The Mahalanobis Distance estimation for a case being an outlier, when a case (observation) was assessed based on the alpha level of $p < .001$ (Tabachnick & Fidell, 2007). Moreover, after reviewing the cases that would be considered as outliers, there were 27 cases found to be outliers. Hair et al. (2010) had cautioned

deleting all outliers and implied that it is quite possible for outliers to occur. It was further cautioned that exclusion of outliers will affect the generalizability of the population of the study. Therefore, a detailed visual inspection of the 27 cases was conducted closely to eliminate only the most extreme outliers that had the highest influence. Eleven cases were removed (38, 84 112, 210, 212, 217, 219, 243, 320, 377 and 399) as extreme cases, subsequently (412-11) N = 401 was used for further analysis. The reasoning behind this decision was due to the goal of this study to ensure the results of the statistical analysis were reflected the most of the data as long the remaining outliers are not problematic (Stevens, 2009). More details showed in Appendix D.

In terms of linearity assumption, linearity is assumed when the relationship between variables is linear. As shown in Figure 5.1, through examination of the scatter plot diagram residuals; the results indicated a straight line connection with a predicated dependent variable mean of behavioral intention. Therefore, the results did not show any support for non-linearity. The results of the linearity of other endogenous can be found in Appendix E.

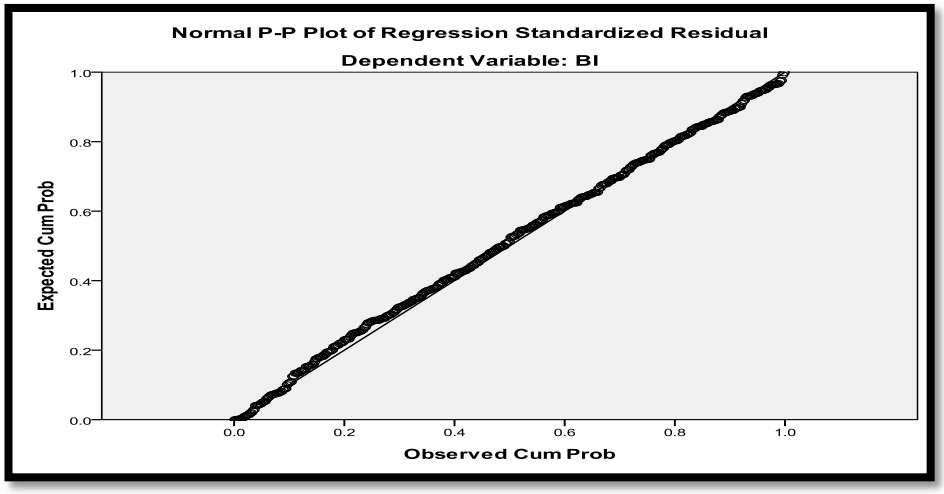

Figure 5.1: Linearity Assumption

In terms of normality assumption, normality refers to the shape of the distribution that is used to describe the bell shape curve (symmetrical). Hair et al. (2010) suggested that with a sample size of 200 or more, there is no worry regarding normality distribution of the variables. Thus, this study used more than 200 cases. Nevertheless, normality testing was conducted in this study. There are various statistical and graphical methods to utilize to observe the normality distribution. From the statistical point view, skewness and kurtosis are used to test the values for normality. If the values of skewness and kurtosis are zero, the observed distribution is precisely normal and if the values between +1 and – 1, no problematic deviations from normality (see Appendix F).

In addition, another statistical method is to utilize descriptive statistics for the items; therefore, descriptive statistics were examined for normality assumption. Appendix F shows the descriptive statistics for all items with the Likert scaled items. As the results from the descriptive statistics were obtained, the mean values and the standard

deviation values of the 39 items showed no obvious departure from normality. The lowest mean value was 3.21 and the highest mean value was 5.70. For the standard deviation, the lowest standard deviation value was 1.187 and the highest value was 1.547 with a difference of only .360.

Furthermore, from the graphical perspective, normal p-p plot and a histogram were used to observe the normality of the distribution of the residuals. According to Basole (2006), the histogram is a frequency plots accomplish by inserting the data in regularly spaced cells and plotting each cell frequency versus the center of the cell. If a superimposed normal density function reflects the histogram, there is no departure from normality.

As shown in Figure 5.2, upon examination of the histogram, the results indicated the distribution approximated a normal curve shape, suggesting the data conformed to the normality assumption. The results of the histogram of other endogenous can be found in Appendix E. It can be concluded, the data was inspected based on the above guidelines and was considered satisfactory for further analysis.

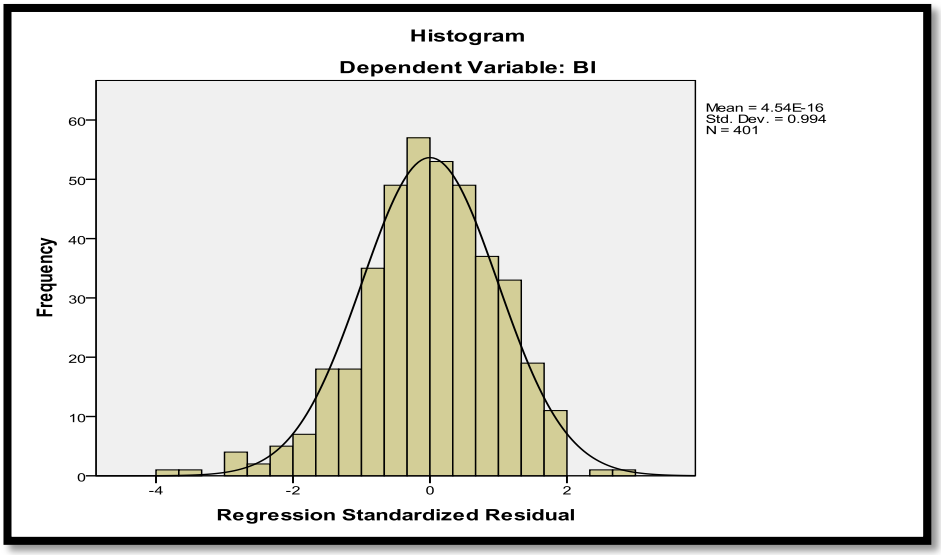

Figure 5.2: Normality Assumption

5.2.3 Assessment of Multicollinearity

In terms of multicollinearity, it can occur when a predicted variable is highly correlated with other sets of predicted variables. The multicollinearity can be examined by inspected the results of tolerance and variance inflation factor (VIF). As shown in Table 5.2, the results of this study showed that tolerance values were between .716 and .955, and the VIF values were between 1.047 and 1.396. Given the standard value of tolerance > 0.10 and the value of VIF < 10, it can be suggested that no multicollinearity between variables exists. The results of other endogenous multicollinearity testing can be found in Appendix G.

Table 5.2: Multicollinearity Testing Through the Assessment of Tolerance and VIF

Variable	Tolerance	VIF
ATT	.716	1.396
PU	.747	1.338
FC	.809	1.236
PITT	.844	1.184
Cost	.955	1.047

Dependent Variable: BI

5.3 Descriptive Statistics (N=401)

Once the missing data, errors and outliers were cleaned from data, the descriptive statistics were performed for the twelve constructs in this study. Table 5.3 shows that the personal innovativeness in IT (PIIT) has the highest mean (5.52) while the cost has the lowest mean (3.24). Furthermore, the standard deviations for all constructs range from 1.006 to 1.324 which indicated the existence of a considerable acceptance of variability in the data.

Table 5.3: Descriptive Statistics for All Constructs (n=401)

Construct Name	Code	Mean	S.D	Min.	Max.
Perceived usefulness	PU	4.78	1.006	1	7
Attitude	ATT	4.66	1.186	1	7
Subjective norm	SN	4.30	1.085	1	7
Cost	Cost	3.24	1.324	1	7
Perceived ease of use	PEOU	5.35	1.076	2	7
Personal descriptive norm	PDN	4.08	1.231	1	7
Facilitating conditions	FC	4.58	1.159	1	7
Personal Injunctive norm	PIN	4.58	1.123	1	7
Personal Innovativeness in IT	PITT	5.52	1.212	1	7
Societal Injunctive norm	SIN	4.31	1.213	1	7
Societal descriptive norm	SDN	3.97	1.240	1	7
Behavioral intention	BI	5.22	1.136	1	7

5.4 Characteristics of the Respondents

The demographic profile of the participants is presented in Table 5.4. The age distribution of the respondents is mainly from 18 to 26 years old (92.3 %). Among the participants, males dominated about (60 %) over females (40 %). The majority of the participants (88 %) were undergraduate students. More than (87 %) were using prepaid schemes.

In addition, regarding the term of m-commerce awareness, about (73 %) of participants were aware of m-commerce while just (20 %) were m-commerce users. In terms of mobile phone usage, about (68 %) had used mobile phones for more than 4 years. With regard to mobile phone expenditure, (46 %) of participants were spending from 10 to 30 JD (Jordanian Dinar, 1 JD = $ 1.40) approximately ($14-$42) a month. In terms of internet usage, more than (46 %) of participants had used internet between 1 to 5 years. In addition, approximately (49 %) were using the internet from 1 to 3 hours a day.

Table 5.4: Characteristics of Respondents

Variable	Frequency	%	Variable	Frequency	%
Age			**Ownership of mobile phone**		
Less than 20	146	36.4	Yes	401	100.0
21-23	174	43.4	No	0	0.0
24-26	50	12.5			
27-30	23	5.7	**Mobile phone usage**		
31-35	5	1.2	Less than 1 Year	24	6.0
Over 35	3	.7	1-2 Years	46	11.5
			3-4 Years	59	14.7
Gender			More than 4 Years	272	67.8
Male	240	59.9			
Female	161	40.1	**Awareness of m- commerce**		
			Yes	293	73.1
Education level			No	108	26.9
Undergraduate	356	88.8			
Postgraduate	45	11.2	**Payment type**		
			Prepaid	350	87.3
Years of Internet usage			Monthly bill	51	12.7
Less than 1 Year	29	7.2			
1-5 Years	185	46.1	**Purchasing by mobile phone**		
6-10 Years	126	31.4	Yes	81	20.2
More than 10 Years	61	15.2	No	320	79.8
Hours of Internet usage/daily			**Mobile phone expenditure/monthly**		
Less than 1 hour	78	19.5	Under 10 JD	138	34.4
1-3 hours	197	49.1	10-30 JD	186	46.4
4-7 hours	87	21.7	31-50 JD	48	12.0
Over 7 hours	39	9.7	Over 50 JD	29	7.2

5.5 Testing of Non-Response Bias

To ensure the data is free from non-response bias, an independent samples t-test was conducted. The researcher used comparisons with known values such as behavioral intention and attitude. Furthermore, the data was divided into two parts (n = 200, and n = 201). In Table 5.5, the mean of behavioral intention for the first group of 200 responses was 5.31 and the mean for the second group of 201 responses was 5.14. This indicated that respondents from both groups were free from data bias, as it was also confirmed by the t-test as shown in Table 5.6; there were no significant

differences between behavioral intention response groups. Thus, the data is free from response bias.

Table 5.5: Group Statistics for Behavioral Intention

	Group	N	Mean	Std. Deviation	Std. Error Mean
Behavioral Intention	1	200	5.31	1.065	.075
	2	201	5.14	1.199	.085

Table 5.6: Independent Samples T-Test for Behavioral Intention

	Levene's Test		T-test for Equality of Means				
	F	Sig.	t	df	Sig.(2-tailed	Mean Differences	Std. Error Differences
Equal variances assumed	.362	.548	1.56	399	.118	.177	.113
Equal variances not assumed			1.56	394.029	.118	.177	.113

Another example, as shown in Table 5.7, the mean of attitude for the first group of 200 responses was 4.69 and the mean for the second group of 201 was 4.62. This indicated that respondents from both groups were free from data bias, as confirmed by independent samples t-test.

Table 5.7: Group Statistics for Attitude

	Group	N	Mean	Std. Deviation	Std. Error Mean
Attitude	1	200	4.69	1.150	.081
	2	201	4.62	1.222	.086

As shown in Table 5.8, there is no significant difference between attitude and response groups. Therefore, the data are free from response bias (See Appendix H for more details).

Table 5.8: Independent Samples T-Test for Attitude

	Levene's Test		**T-test for Equality of Means**				
	F	Sig.	t	df	Sig.(2-tailed	Mean Differences	Std. Error Differences
Equal variances assumed	3.17	.075	.645	399	.519	.076	.119
Equal variances not assumed			.645	397.785	.519	.076	.118

5.6 Reliability Testing

Table 5.9 shows the Cronbach's alpha values for each variable in the survey. On the basis of the data presented in the table, there is a strong evidence to conclude that the internal consistency was established and the instrument is reliable. Moreover, the Cronbach's alpha values for all variables were above .70, with one exception for facilitating conditions (.614) above .60 which was considered acceptable (Hair, et al., 2010). Thus, the items used in this study are based on well-established instruments with high Cronbach's alpha values (from prior studies). Therefore, the reliability analysis revealed an acceptable level of reliability values and the appropriateness of the instrument (see Appendix I). Furthermore, acceptable levels of Cronbach's alpha values are indirect indicator of the convergent validity acceptable (composite reliability) which will be discussed in the CFA section.

Table 5.9: Reliability Level - Cronbach's Alpha for the Variables in the Survey

Variable Name	N of Items	Cronbach's Alpha
Attitude	3	.773
Subjective norm	5	.835
Perceived usefulness	5	.783
Perceived ease of use	3	.819
Personal descriptive norm	3	.868
Facilitating conditions	2	.614
Personal Injunctive norm	3	.874
Personal Innovativeness in IT	3	.850
Societal Injunctive norm	3	.877
Cost	3	.879
Societal descriptive norm	3	.879
Behavioral intention	3	.850

5.7 Exploratory Factor Analysis (EFA)

According to Hair et al. (2010), there are three stages of factor analysis. The first stage is to determine the number of extracted factors through the initial non-rotated factor matrix. The second stage, will rotate the factors if it is needed which leads to the reduction of the number of items. The third stage, will inspect the variables and decide whether to delete any of them, due to the low factor loading or the cross loadings.

In this study, SPSS 18.0 was utilized to conduct the factor analysis. Moreover, principle component factor analysis and varimax rotation were used to obtain the results from the exploratory factor analysis from the eleven independent factors. The results revealed (see Appendix J), that the Kaiser-Meye-Olkin (KMO) measure of the sampling adequacy value was (.859). This is greater than the recommended value (0.5) by Field (2009). Thus, it indicated that the data is appropriate for factor

analysis. Moreover, the Bartlett's test of sphericity was highly significant (.000), which revealed that the data is also appropriate for factor analysis ($p < .001$).

Furthermore, the results of extracted components showed eleven factors with eigenvalue exceeding one. These eleven factors explained more than 74 % of the variance. In addition, the factor loading through varimax rotation showed eleven factors. However, there was a cross loading of one factor (PU4), which had a value less of than (0.5) (Field, 2009). Therefore, the item was excluded from further analysis due to the cross loadings and low factor loading. Then the dataset was re-run after eliminating PU4 as shown in (Appendix J). All factor loadings were above the cutoff point (.50) that was recommended by (Field, 2009).

5.8 Confirmatory Factor Analysis (CFA)

The measurement model (also called the confirmatory factor analysis) is the first stage in structural equation modeling (SEM). The CFA determines how well the indicators (observed variables) are related to the latent variables (unobserved variables). Moreover, all measurement models are based on a pre-established theory and empirical reviews. In this study, the AMOS 18.0 software was used to perform the CFA analysis. If the factor loading for each item, the convergent validity, the composite reliability, the average variance extracted (AVE), the discriminant validity and the goodness of fit measures for the measurement model are acceptable, it can be

concluded that the indicators (observed variables) adequately measured the intended latent variables (Hair, et al., 2010).

5.9 Validity Testing

The first step in the CFA analysis is to test the validity through the convergent validity (factor loading, standardized residual covariance matrix, composite reliability, Average Variance Extracted (AVE) and discriminant validity) as all discussed and reported in the following two sections.

5.9.1 Convergent Validity

The standardized factor loadings and the standardized residual covariance matrix were inspected for the initial evidence of convergent validity (Gu, et al., 2009). According Hair et al. (2010), items loading should be at least .50 to be considered an acceptable item. Moreover, items greater than |4.0| in the standardized residual covariance matrix should be deleted. The results found all items loading were above .50. However, the results also found that two items (PU5 and SN1) were greater than |4.0|, therefore, the items were eliminated.

Next, the measurement model was tested for composite reliability and average variance extracted (AVE) as shown in Table 5.10. The results indicated that all composite reliability values were greater than (.60) which was recommended by (Gu,

et al., 2009; Lu, et al., 2008; Verkasalo, et al., 2010). Moreover, Table 5.10 showed that all average variance extracted (AVE) values exceeded the recommended value (.50) except the facilitating conditions construct (.45), which was below the recommended value. One possible explanation is the facilitating conditions construct was the only factor measured by two items, which researcher believed it led to the low AVE. On the other hand, facilitating conditions construct factor loadings were above the recommended value (FC1=.675 and FC2= .660) and the composite reliability was (.62), which was above the cut-off level of (.60). Therefore, no action was taken due to the satisfactory of the factor loadings and the value of composite reliability.

Overall, in this study, all indicators were loaded above .50 and they were related to their particular constructs, therefore, it can be concluded that an acceptable convergent validity was met (more details in Appendix K and L).

Table 5.10: Test of Convergent Validity

Construct	Items	FL	SFL	SEV*	CR**	AVE***
Attitude	At1	.751	0.564001	0.435999		
	At2	.821	0.674041	0.325959	0.788	0.556
	At3	.656	0.430336	0.569664		
Intention	BI1	.751	0.564001	0.435999		
	BI2	.868	0.753424	0.246576	0.853	0.660
	BI3	.814	0.662596	0.337404		
Cost ****	C1	.843	0.710649	0.289351		
	C2	.955	0.912025	0.087975	0.885	0.721
	C3	.735	0.540225	0.459775		
Facilitating conditions	FC1	.675	0.455625	0.544375		
	FC2	.660	0.435600	0.564400	0.616	.446
Personal descriptive norms	PDN1	.851	0.724201	0.275799		
	PDN2	.910	0.828100	0.171900	0.874	0.700
	PDN3	.740	0.547600	0.452400		
Perceived ease of use	PEOU1	.796	0.633616	0.366384		
	PEOU2	.793	0.628849	0.371151	0.821	0.605
	PEOU3	.743	0.552049	0.447951		
Personal innovativeness in IT	PIIT1	.755	0.570025	0.429975		
	PIIT2	.788	0.620944	0.379056	0.856	0.665
	PIIT3	.897	0.804609	0.195391		

Personal injunctive norm	PIN1	.816	0.665856	0.334144		
	PIN2	.866	0.749956	0.250044	0.875	0.700
	PIN3	.827	0.683929	0.316071		
Perceived usefulness	PU1	.568	0.322624	0.677376		
	PU2	.880	0.774400	0.225600	0.776	0.543
	PU3	.729	0.531441	0.468559		
Societal descriptive norm	SDN1	.788	0.620944	0.379056		
	SDN2	.903	0.815409	0.184591	0.883	0.717
	SDN3	.845	0.714025	0.285975		
Societal injunctive norm	SIN1	.793	0.628849	0.371151		
	SIN2	.898	0.806404	0.193596	0.880	0.710
	SIN3	.833	0.693889	0.306111		
Subjective norm	SN2	.524	0.274576	0.725424		
	SN3	.578	0.334084	0.665916	0.805	0.519
	SN4	.870	0.756900	0.243100		
	SN5	.843	0.710649	0.289351		

Note: *FL: Factor Loadings; SFL: Squared Factor Loadings; SEV: Standardized Error Variance; CR: Composite Reliability; AVE: Average Variance Extracted. SEV*= (1 - loadings squared), CR**= $(\sum Factor\ Loading)^2 / (\sum Factor\ Loadings)^2 + \sum Standardized\ Error\ Variance$. AVE*** = (∑Squared Factor Loadings) / n, where n = total number of items for each construct. Cost****: C1,C2 and C3 were reversed coded.*

5.9.2 Discriminant Validity

The discriminant validity can be established when a measurement scale is different (distinct) from other measurement scales (not correlated). According to Hair et al. (2010), the researcher should compare the average variance extracted (AVE) for each factor with the squared correlation associated with that factor. When the AVE is greater than the squared correlation then discriminant validity exists. In Table 5.11, it can be concluded that the AVE for the given factors are greater than the squred correlation of the given factor with other factors in the analysis (AVE > correlation^2).

Table 5.11: Discriminant Validity

		Correlations											
		ATT	**PU**	**PEOU**	**SN**	**FC**	**PDN**	**PIN**	**PIIT**	**SDN**	**SIN**	**Cost**	**BI**
ATT		**0.788**											
PU	Pearson Correlation	.351**	**0.543**										
	(Correlation)^2	.123											
PEOU	Pearson Correlation	.378**	.227**	**0.605**									
	(Correlation)^2	.142	.051										
SN	Pearson Correlation	.534**	.418**	.260**	**0.519**								
	(Correlation)^2	.285	.174	.067									
FC	Pearson Correlation	.357**	.246**	.270**	.285**	**0.446**							
	(Correlation)^2	.127	.060	.072	.081								
PDN	Pearson Correlation	.308**	.346**	.227**	.446**	.209**	**0.700**						
	(Correlation)^2	.094	.119	.051	.198	.043							
PIN	Pearson Correlation	.397**	.368**	.267**	.360**	.349**	.421**	**0.700**					
	(Correlation)^2	.157	.135	.071	.129	.121	.177						
PIIT	Pearson Correlation	.282**	.248**	.330**	.197**	.309**	.188**	.296**	**0.665**				
	(Correlation)^2	.079	.0615	.108	.038	.095	.035	.087					
SDN	Pearson Correlation	.254**	.321**	.049	.258**	.254**	.409**	.418**	.140**	**0.717**			
	(Correlation)^2	.064	.103	.002	.066	.064	.167	.174	.019				
SIN	Pearson Correlation	.343**	.311**	.166**	.354**	.333**	.424**	.521**	.212**	.505**	**0.710**		
	(Correlation)^2	.117	.096	.027	.125	.110	.179	.271	.044	.255			
Cost	Pearson Correlation	-.209**	-.087	-.067	-.155**	-.073	-.097	-.095	-.066	-.087	-.114*	**0.721**	
	(Correlation)^2	-.043	-.007	-.004	-.024	-.005	-.009	-.009	-.004	-.007	-.012		
BI	Pearson Correlation	.456**	.354**	.361**	.345**	.433**	.209**	.407**	.422**	.186**	.338**	-.213**	**0.660**
	(Correlation)^2	.207	.125	.130	.119	.187	.043	.165	.178	.034	.114	-.045	

*** Correlation is significant at the 0.01 level (2-tailed) ; *Correlation is significant at the 0.05 level (2-tailed).*

***Note:** Diagonal values show AVE. Off-diagonal values show correlations and the squared inner-construct correlations.*

5.10 Goodness of Fit Indices of Measurement Model

The measurement model goodness of fit is the next step before conducting structural model (hypotheses testing). Table 5.12 demonstrates that all constructs showed a reasonable goodness of fit except the p-value. However, since the sample size in this research is commonly considered large (> 300), the Chi-square value and the related p value are ignored for their over sensitivity to the sample size (Hair, et al., 2010; Lu, et al., 2005). Therefore, the researchers recommended that it is more appropriate to check on other goodness of fit measures (Hair, et al., 2010).

The ratio-chi-square/degree of freedom (χ^2/df), indicates value of less than 2.0 which indicates a sufficient fit. In addition, other indicators were used to assess the goodness of model-fit such as, comparative fit index (CFI is >.90), root mean square error of approximation (RMSEA is <.05), Turker Lewis index (TLI is >.90) incremental fit index (IFI is >.90), and adjusted goodness of fit index (AGFI is >.80). All model-fit indices exceeded their common recommended level suggested by (Hair, et al., 2010) except (GFI is .880) less than the recommended value. Therefore, it can be concluded that the proposed model has a good fit with the data collected.

Overall, the verifications of good factor loadings, composite reliability, AVE Discriminant validity and goodness of model fit measures indicated that the measurement model was suitable for further estimation with the structural model.

Table 5.12: Goodness of fit Indices for the Measurement Model

Fit Measures	Recommended values	Results
P-value	≥ .05	.000
Ratio (χ^2 /df)	≤ 2.0 (Excellent)	1.870
RMSEA	≤ 0.05 (Excellent)	.047
GFI	≥ 0.90	.880
CFI	≥ 0.90	.940
TLI	≥ 0.90	.928
IFI	≥ 0.90	.941
PCLOSE	≥ 0.50	.890
AGFI	≥ 0.80	.849

5.11 Structural Model (Hypothesized Model)

After the measurement model analysis was fulfilling (completed) then the structural model was examined. Amos 18.0 Graphics was utilized to run the structural model by employing Maximum likelihood estimation. As shown in Figure 5.3, there are five endogenous latent variables influenced by the seven exogenous latent variables in the model. The five endogenous are behavioral intention (BI), attitude (AT), perceived usefulness (PU), perceived ease of use (PEOU) and subjective norm (SN). In the terms of exogenous, there are seven exogenous; they are facilitating conditions (FC), cost, personal innovativeness in information technology (PIIT), personal injunctive norm (PIN), personal descriptive norm (PDN), societal injunctive norm (SIN) and societal descriptive norm (SDN).

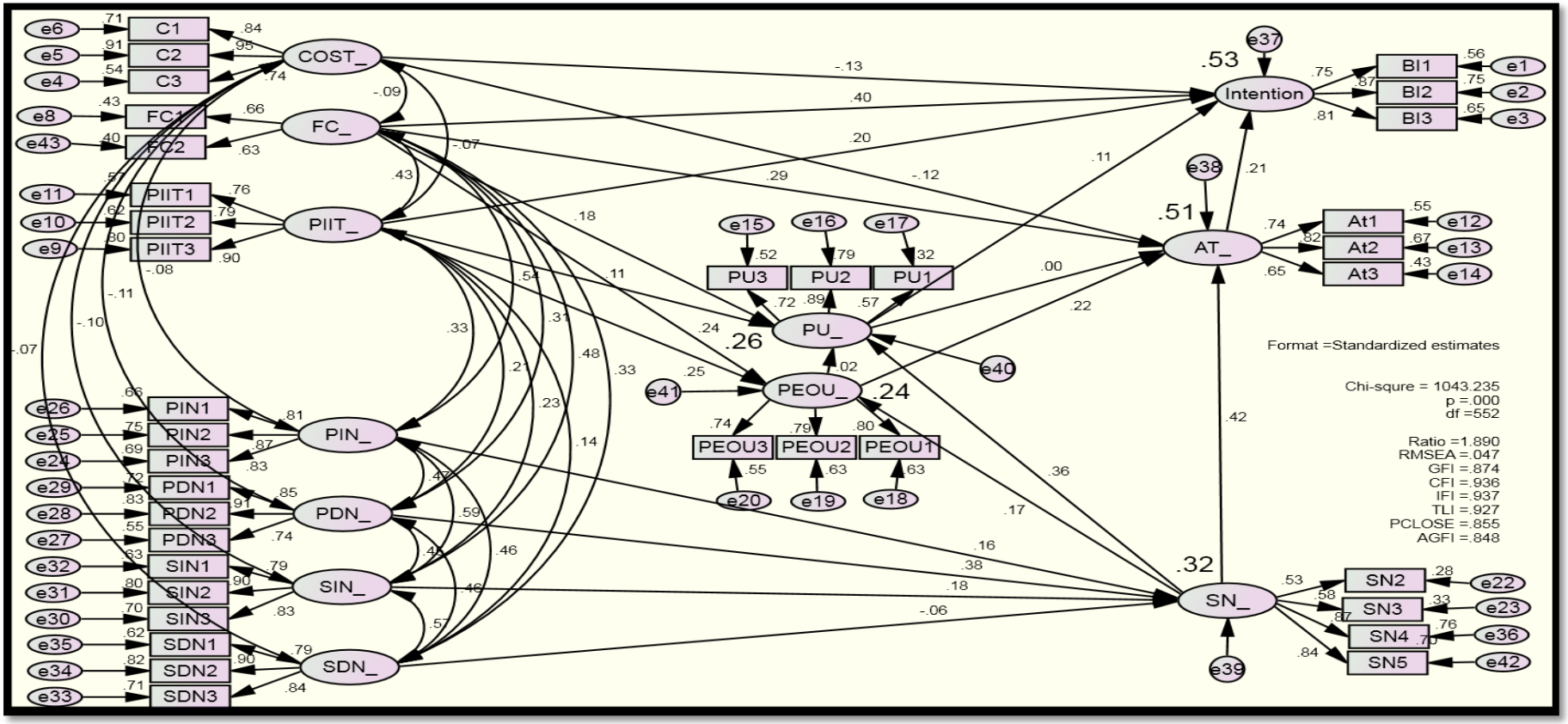

Figure 5.3: Hypothesized Model with Standardized Estimations

5.11.1 Goodness of Fit of Hypothesized Model

Table 5.13 shows the goodness of fit measures of the hypothesized model which showed satisfactory fit. For example, the ratio-chi-square/degree of freedom (χ^2/df = 1.89), indicated less than 2.0 which indicates adequate fit. The comparative fit index (CFI = >.90), root mean square error of approximation (RMSEA = <.05), Turker Lewis index (TLI = >.90) incremental fit index (IFI = >.90), and adjusted goodness of fit index (AGFI = >.80) were all goodness-fit indices that exceeded common recommended values suggested by (Hair, et al., 2010) except (GFI = .874) less than the recommended value which takes into the consideration the complexity of the model when determining the fit (Hair, et al., 2010). Therefore, it can be concluded that the proposed model fits the data collected.

Table 5.13: Goodness of Fit Indices for the Structural- Hypothesized Model

Fit Measures	Recommended values	Results
P-value	$\geq .05$	.000
Ratio (χ^2/df)	≤ 2.0	1.89
RMSEA	≤ 0.05	.047
GFI	≥ 0.90	.874
CFI	≥ 0.90	.936
TLI	≥ 0.90	.927
IFI	≥ 0.90	.937
PCLOSE	≥ 0.50	.855
AGFI	≥ 0.80	.848

5.11.2 Hypotheses Testing

As noted in Table 5.14, there were twenty one hypotheses tested in this study. Out of the twenty one hypotheses, four hypotheses were found not supported. The results showed that behavioral intention was directly affected by personal innovativeness in IT, the standardized coefficient (Beta value) (β = .198; $p < 0.001$), facilitating conditions (β = .399; $p < 0.001$), cost (β = -.132; $p < 0.01$), attitude (β = .210; $p<0.001$) and perceived usefulness (β = .113; $p < 0.05$) or H6a, H7a, H8a, H9 and H10a were supported.

In addition, attitude was directly affected by subjective norm (β = .422; $p<0.001$), facilitating conditions (β = .291; $p<0.001$), cost (β = -.119; $p < 0.05$) and perceived ease of use (β = .222; $p<0.001$) except perceived usefulness (β = .001; $p>0.05$) was found not supported or H1a, H7b, H8b and H11b were supported except H10b was not supported.

Furthermore, perceived ease of use was directly affected by subjective norms (β = .167; $p<0.01$), personal innovativeness in IT (β = .255; $p<0.001$) and facilitating conditions (β = .242; $p>0.01$) or H1c, H6c and H7d were supported.

In terms of perceived usefulness, it was directly affected by subjective norms (β = .364; $p<0.001$) and facilitating conditions (β = .182; $p<0.05$) except perceived ease of use (β = .022; $p>0.05$) and personal innovativeness in IT (β = .114; $p>0.05$) were found not supported or H1b and H7c were supported, except H6b and H11a were not supported.

Subjective norm is directly affected by personal injunctive norm ($\beta = .159$; $p<0.05$), personal descriptive norm ($\beta = .381$; $p<0.001$) and societal injunctive norm ($\beta = .183$; $p<0.05$) except societal descriptive norm ($\beta = -.058$; $p>0.05$) was found not supported or H2, H3 and H4 were supported, except H5 was not supported.

In terms of squared multiple correlation (SMC) or in other terms (R^2), the (R^2) for the five endogenous in the study were 53 %, 51 %, 32 %, 26 % and 24 % for behavioral intention, attitude, subjective norm, perceived usefulness and perceived ease of use respectively. For example, the research model was accounted for fifty three (53 %) of the variance of behavioral intention. Fifty one (51 %) of variance was accounted for attitude. Thirty two (32 %) of variance was accounted for subjective norms. Twenty six (26 %) was accounted of variance of perceived usefulness. Twenty four (24 %) was accounted of variance of perceived ease of use (see Appendix M).

Figure 5.4 shows the hypotheses results in this study in a simplified path model; it also shows the significant and the insignificant results.

Table 5.14: Direct Hypotheses Testing Results

Hypothesis			Code	Standardized Estimate	S.E.	C.R.	p	Status	Results
Exo		**Endo**							
Subjective norm	⇨	Attitude	H1a	.422	.108	5.992	***	Sig	Supported
Subjective norm	⇨	Perceived usefulness	H1b	.364	.102	5.282	***	Sig	Supported
Subjective norm	⇨	Perceived ease of use	H1c	.167	.092	2.792	.005	Sig	Supported
Personal injunctive norm	⇨	Subjective norm	H2	.159	.046	2.304	.021	Sig	Supported
Personal descriptive norm	⇨	Subjective norm	H3	.381	.049	5.379	***	Sig	Supported
Societal injunctive norm	⇨	Subjective norm	H4	.183	.044	2.470	.013	Sig	Supported
Societal descriptive norm	⇨	Subjective norm	H5	-.058	.040	-.883	.377	Insig	Not Supported
Personal innovativeness in IT	⇨	Behavioral intention	H6a	.198	.046	3.481	***	Sig	Supported
Personal innovativeness in IT	⇨	Perceived usefulness	H6b	.114	.056	1.752	.080	Insig	Not Supported
Personal innovativeness in IT	⇨	Perceived ease of use	H6c	.255	.059	3.899	***	Sig	Supported
Facilitating conditions	⇨	Behavioral Intention	H7a	.399	.097	4.656	***	Sig	Supported
Facilitating conditions	⇨	Attitude	H7b	.291	.093	3.958	***	Sig	Supported
Facilitating conditions	⇨	Perceived usefulness	H7c	.182	.098	2.256	.024	Sig	Supported
Facilitating conditions	⇨	Perceived ease of use	H7d	.242	.100	3.087	.002	Sig	Supported
Cost (negatively)	⇨	Behavioral Intention	H8a	-.132	.042	-2.817	.005	Sig	Supported
Cost (negatively)	⇨	Attitude	H8b	-.119	.048	-2.465	.014	Sig	Supported
Attitude	⇨	Behavioral Intention	H9	.210	.058	3.250	.001	Sig	Supported
Perceived usefulness	⇨	Behavioral Intention	H10a	.113	.050	2.103	.035	Sig	Supported
Perceived usefulness	⇨	Attitude	H10b	.001	.062	.008	.993	Insig	Not Supported
Perceived ease of use	⇨	Perceived usefulness	H11a	.022	.063	.338	.735	Insig	Not Supported
Perceived ease of use	⇨	Attitude	H11b	.222	.060	3.691	***	Sig	Supported

Sig: Significant; Insig: Insignificant

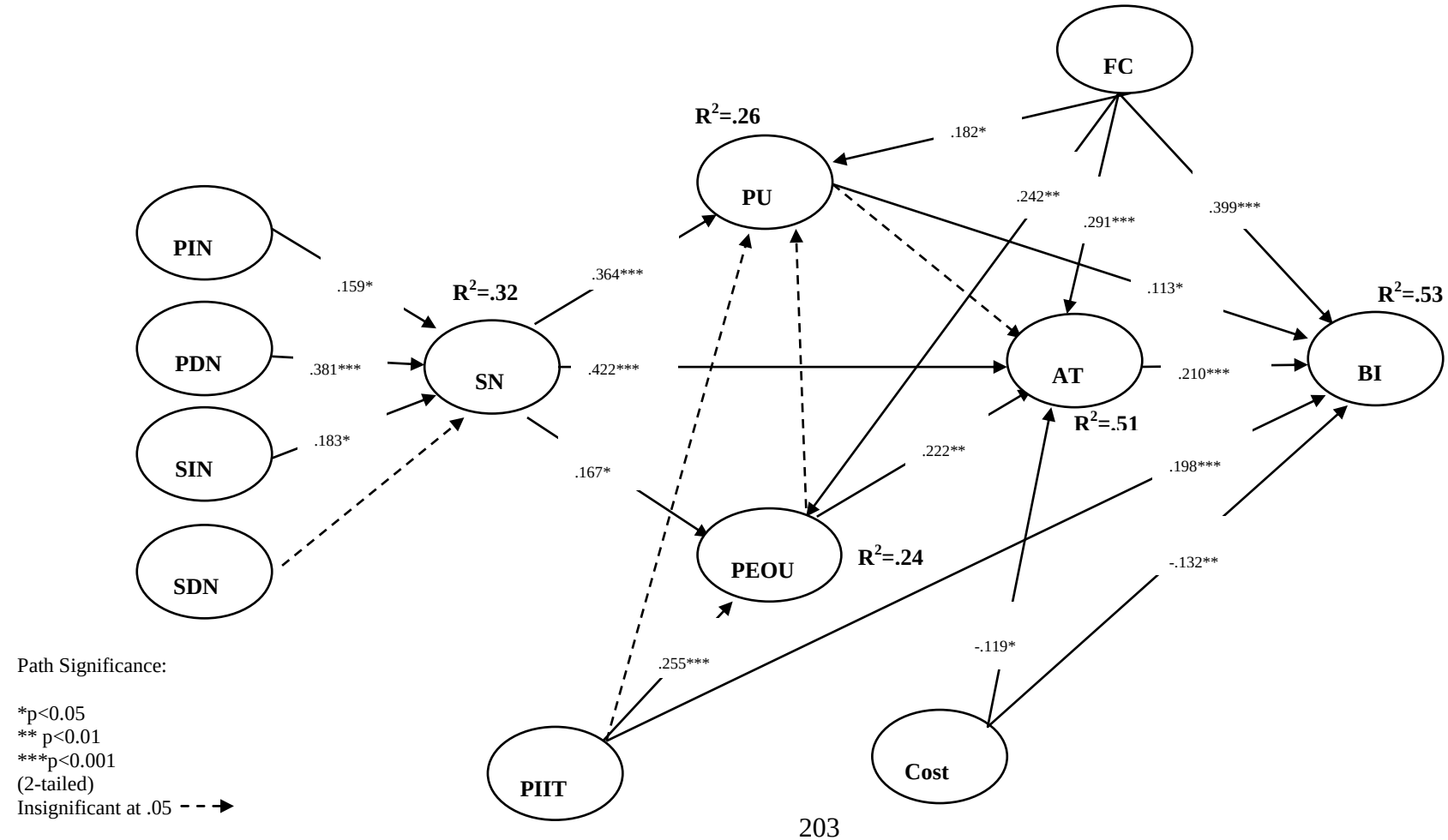

Figure 5.4. Hypothesized Model Results

5.12 Competing (Revised) Model Analysis

In order to improve the structural (hypothesized) model fit, respecification should be considered. According to Hair et al. (2010) "any respecification must have strong theoretical as well as empirical support" (p. 720). In addition, the purpose of respecification is to improve model fit that is theoretical supported and justified rather than searching for relationships. Therefore, researcher in this study tested the direct relationship between subjective norms and behavioral intention and the relationship between perceived ease of use and behavioral intention as shown in Appendix N. Table 5.15 compares the goodness of fit between the hypothesized model and the revised model. The results revealed that the revised model has χ^2 value of 1039.866 with 550 degrees of freedom which are slightly less than the hypothesized model (χ^2 value of 1043.235 with 552 degrees of freedom). Moreover, P-value ratio, RMSEA, GFI, CFI, IFI, TLI, PCLOSE and AGFI remained the same as the hypothesized model.

Table 5.15: Comparison of Goodness of Fit Indices between Revised Model and Hypothesized Model

Fit Measures	Revised Model	Hypothesized Model
χ^2 (Chi-square)	1039.866	1043.235
Degree of freedom	550	552
P-value	.000	.000
Ratio (χ^2/df)	1.89	1.89
RMSEA	.047	.047
GFI	.875	.874
CFI	.936	.936
TLI	.927	.927
IFI	.937	.937
PCLOSE	.853	.855
AGFI	.849	.848

Several of the path estimates from the hypothesized model have change slightly as shown in Table 5.16. The most notable is the relationship between attitude and behavioral intention (β = .141) is less supported than the hypothesized model (β = .210). Other notable changes is the relationship between PIIT and behavioral intention (β = .198) is less supported than the hypothesized model (β = .175). Furthermore, the results of the relationships between subjective norms and behavioral intention (β = .049; p>0.05) and the relationship between perceived ease of use and behavioral intention (β = .102; p>0.05) are not supported by the revised model.

Table 5.16: Comparison of Structural Relationship

Hypothesized Model				**Revised Model**			
Structural Relationship			**β**	**Structural Relationship**			**β**
Attitude	⇨	Intention	.210	Attitude	⇨	Intention	.141
Perceived usefulness	⇨	Intention	.113	Perceived usefulness	⇨	Intention	.098
PIIT	⇨	Intention	.198	PIIT	⇨	Intention	.175
Facilitating conditions	⇨	Intention	.399	Facilitating conditions	⇨	Intention	.390

These findings suggest that the hypothesized model is better than the revised model in many ways. First, the relationships between attitude and behavioral intention and the relationship between PIIT and behavioral intention are more supported in hypothesized model than the relationships in the revised model. Second, the relationships between subjective norms and behavioral intention and the relationship between perceived ease of use and behavioral intention are not empirically supported by the revised model. Third, the differences in the goodness of fit measures are slightly better (not significant) in the revised model than the hypothesized model ,

however, the values of P-value ratio, RMSEA, GFI, CFI, IFI, TLI, PCLOSE and AGFI are remained the same as the hypothesized model.

5.13 Comparing Model Analysis (Original Model)

Based on the technology acceptance Model (TAM), the comparing model for this research was examined as one of the alternative to test whether the proposed theoretical model (TAM) is reliable or not with the data collected. As shown in Figure 2.7 (Chapter 2), the comparing model did not have (subjective norm, personal innovativeness in IT, cost and facilitating conditions) neither have the decomposing of subjective norms in the original model.

5.13.1 Goodness of Fit of Comparing Model

Table 5.17 shows the goodness of fit measures for the comparing model (Figure 5.5) where the model achieved satisfactory goodness of fit measures. For example, the Ratio (χ^2/df) was 2.72 which indicated an acceptable fit. Moreover, RAMSE was .066 lower than the recommended value .08. GFI was .947, CFI was .956, TLI was .941, IFI was .957 and AGFI was .916 which all exceeded the recommended values

Table 5.17: Goodness of Fit Indices for the Comparing Model

Fit Measures	Recommended values	Results
P-value	$\geq .05$	.000
Ratio (χ^2 /df)	≤ 3.0	2.72
RMSEA	≤ 0.08	.066
GFI	≥ 0.90	.947
CFI	≥ 0.90	.956
TLI	≥ 0.90	.941
IFI	≥ 0.90	.957
AGFI	≥ 0.80	.916

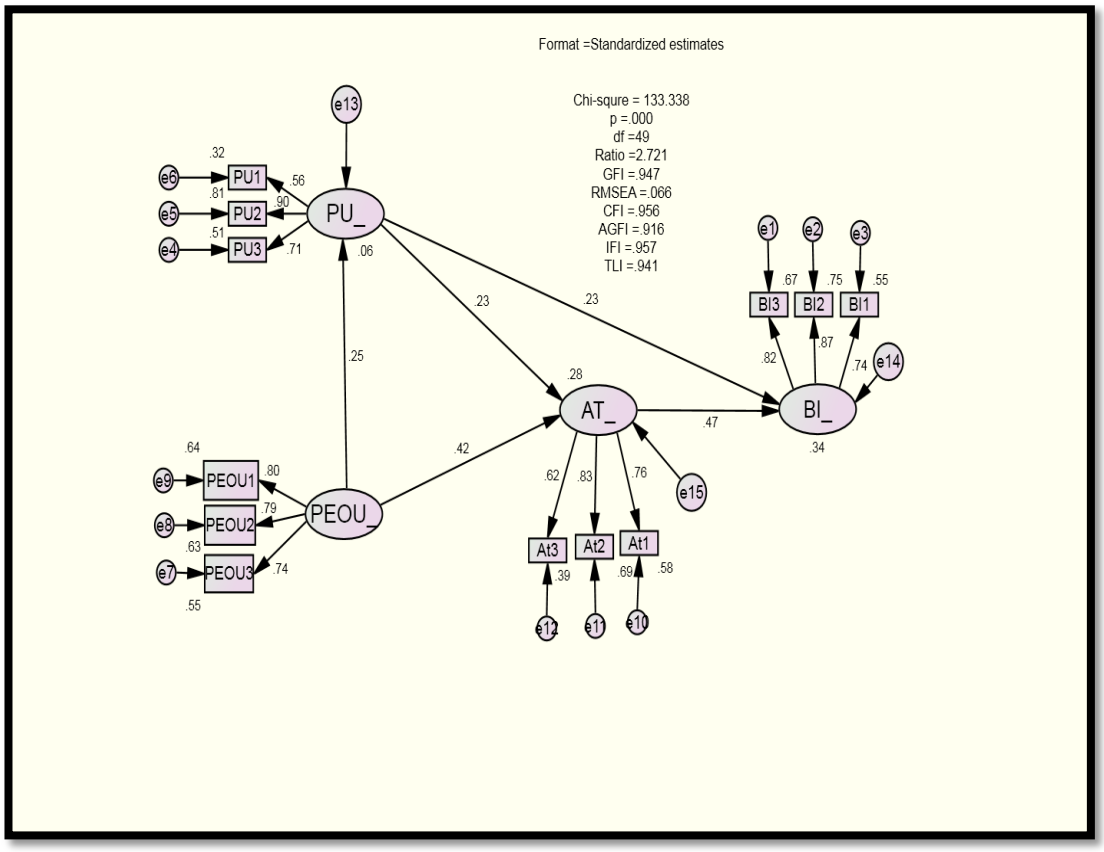

Figure 5.5: *Comparing Model of TAM*

5.13.2 Hypotheses Testing for Comparing Model

As noted in Table 5.18, all the relationships in the comparing model were significant at .001 level. In terms of (R^2), for the three endogenous in the study they were 34 %, 28 % and 6 % for behavioral intention, attitude and perceived usefulness respectively (See Appendix N).

Table 5.18: Comparing Model Hypotheses Testing

Hypotheses			Estimate	S.E.	C.R.	p	Status	Results
Exo		**Endo**						
Perceived ease of use	⟹	Perceived usefulness	.286	.072	3.994	***	Sig	Supported
Perceived usefulness	⟹	Attitude	.249	.063	3.945	***	Sig	Supported
Perceived ease of use	⟹	Attitude	.528	.080	6.641	***	Sig	Supported
Perceived usefulness	⟹	Behavioral Intention	.241	.060	4.015	***	Sig	Supported
Attitude	⟹	Behavioral Intention	.463	.061	7.541	***	Sig	Supported

**** Significant at 0.001 level*

5.14 Chapter Summary

This chapter presented the findings of the research that was obtained from the quantitative analysis. The reliability analysis was tested and was accepted when the measurement model was established in terms of the convergent validity, discriminant validity and goodness of fit measures, the structure model was also tested for goodness of fit and hypotheses testing. Out of twenty one hypotheses; four hypotheses were insignificant.

CHAPTER SIX
DISCUSSIONS AND CONCLUSION

This chapter presents the findings discussion of the study that obtained through the quantitative analysis (Chapter 5) regarding the relationships among each construct in fulfillment of the study objectives. This is followed by the discussion of the contributions from both theoretical and practical sides. It concludes with the research implications, research limitations, future research direction, and conclusion.

6.1 Recapitulation of the Research Objectives

To recapitulate, the research objectives of this study are: (1) to investigate the critical determinants that affecting the individual's adoption decision to adopt m-commerce in Jordan, (2) to investigate whether decomposed subjective norms factors are significantly influencing subjective norms. Moreover, to distinguish between the antecedents of subjective norms (personal and societal norms levels) with respect to the impact on m-commerce behavioral intention among Jordanians in a collectivist culture (3) to closely investigate how much of the attitude perception, perceived usefulness perception and perceived ease of use perception can be explained by subjective norms in the context of a collectivist culture such as Jordan, (4) to evaluate and validate the applicability of the theoretical model TAM, also to evaluate the extended TAM by new factors and decomposing subjective norms in order to explain m-commerce behavioral intention. The achievement of the research

objectives would assist practitioners and academic researchers to understand and to explain the drivers of m-commerce in Jordan. The following sections will discuss the findings and the support of each relationship in the study.

6.2 Findings from Hypotheses Testing

To provide answers to the research questions and to achieve the research objectives, this study postulated twenty one hypotheses based on an extensive literature review. Table 6.1 summarizes the results of the research hypotheses. The results from the empirical testing concluded that seventeen hypotheses and sub-hypotheses have been supported from the empirical study (H1a, H1b, H1c, H2, H3, H4, H6a, H6c, H7a, H7b, H7c, H7d, H8a, H8b, H9, H10a and H11b). While four research hypotheses were not supported (H5, H6b, H10b and H11a).

Table 6.1: A summary of Hypotheses Testing Results

Code	Estimate	S.E.	C.R.	p	Status	Results
H1a	.422	.108	5.992	***	Sig	Supported
H1b	.364	.102	5.282	***	Sig	Supported
H1c	.167	.092	2.792	.005	Sig	Supported
H2	.159	.046	2.304	.021	Sig	Supported
H3	.381	.049	5.379	***	Sig	Supported
H4	.183	.044	2.470	.013	Sig	Supported
H5	-.058	.040	-.883	.377	Insig	Not Supported
H6a	.198	.046	3.481	***	Sig	Supported
H6b	.114	.056	1.752	.080	Insig	Not Supported
H6c	.255	.059	3.899	***	Sig	Supported
H7a	.399	.097	4.656	***	Sig	Supported
H7b	.291	.093	3.958	***	Sig	Supported
H7c	.182	.098	2.256	.024	Sig	Supported
H7d	.242	.100	3.087	.002	Sig	Supported
H8a	-.132	.042	-2.817	.005	Sig	Supported
H8b	-.119	.048	-2.465	.014	Sig	Supported
H9	.210	.058	3.250	.001	Sig	Supported
H10a	.113	.050	2.103	.035	Sig	Supported
H10b	.001	.062	.008	.993	Insig	Not Supported
H11a	.022	.063	.338	.735	Insig	Not Supported
H11b	.222	.060	3.691	***	Sig	Supported

Sig: Significant; Insig: Insignificant

6.3 First Objective: Critical Determinants to Adopt M-commerce

6.3.1 Findings Related to the Antecedents of Behavioral Intention

Behavioral intention was found to be directly affected by attitude (β = .210, $p<0.001$), perceived usefulness (β = .113, $p<0.05$), facilitating conditions (β = .399, $p<0.001$), personal innovativeness in IT (β = .198, $p<0.001$) and cost (β = -.132, $p<0.01$). Facilitating conditions factor was the most supported factor that influenced behavioral intention followed by attitude, PIIT, cost and perceived usefulness respectively. In addition, the findings indicated that the research model can explain (53 %) of the variance in individual's behavioral intention to adopt m-commerce in Jordan. The next sections will discuss the results of the hypotheses in details.

First predictor (H9): *The effects of Attitude on behavioral intention.*

Empirical evidence from this research shows that attitude is significantly influencing behavioral intention in a positive way. Therefore, H9 is supported. This result is expected and the finding is in line with other findings in previous studies (Cheong & Park, 2005; Jayasingh & Eze, 2010; Kim, et al., 2009b; Liang & Yeh, 2011; Nysveen, et al., 2005a; Nysveen, et al., 2005b; Shin, 2011).

This result indicated that mobile phone users in Jordan have a favorable and a positive attitude towards behavioral intention to use m-commerce. Moreover, this finding shows that attitude appears to be a key predictor ($\beta = .210$; $p<0.001$) of behavioral intention in Jordan. In other terms, the finding suggested that the formation of positive attitude about m-commerce should take place before m-commerce can be accepted. It means the more favorable (positive) the attitude the stronger should be an individual's behavioral intention to perform (adopt) the behavior. Therefore, suggesting that mobile companies in Jordan should focus on creating a more favorable attitude in order to have a strong behavioral intention to use m-commerce.

However, Venkatesh & Davis (2000) suggested the exclusion of attitude in TAM2. This was justified by the researchers finding that in work settings (mandatory settings), individuals may use the technology even if their attitudes are not positive. On the other hand, this research is based on voluntary settings due to the nature of the adaptation of m-commerce services by individuals. This study suggested that intention to use m-commerce in Jordan formed based on attitude and other factors

towards using the systems. In simple terms, it can be concluded that the more favorable and positive the attitude, the stronger that m-commerce will be used by individual's to perform the behavior in Jordan.

Second predictor (H10a): *The effects of perceived usefulness on behavioral intention.*

The finding from this empirical study shows that perceived usefulness is significantly and positively influencing behavioral intention in Jordan. Therefore, the hypothesis H10a is supported. This result is consistent with the hypothesis of TAM (Davis, 1989). In addition, the finding is in line with other researchers results found in previous studies (Cheong & Park, 2005; Dai & Palvia, 2009; Khalifa & Shen, 2008b; Koenig-Lewis, et al., 2010; Liu & Chen, 2009; Lu, et al., 2008; Lu, et al., 2005; Luarn & Lin, 2005; Mao, et al., 2005; Nysveen, et al., 2005b; Sripalawat, et al., 2011; Wei, et al., 2009; Zhang & Mao, 2008).

The result indicated that mobile phone user's intention in Jordan can be predicted and can be explained through perceived usefulness ($\beta = .113$; $p < 0.05$). Furthermore, it appears that mobile phone users perceive the usefulness and the advantages of m-commerce services such as convenience; mobility, 24-h access anytime, anywhere and access without the limitations of the physical location such as traditional e-commerce. Therefore, mobile operators and managers in the field should promote the advantages of using m-commerce in terms of convenience and the ability to access services anytime and anywhere.

Third predictor (H7a): *The effects of facilitating conditions on behavioral intention.*

The empirical result from this study indicated a significant and positive relationship between facilitating conditions and behavioral intention. Hence, the hypothesis H7a is supported. This result is consistent with other previous studies (Crabbe, et al., 2009; Saeed, 2011; Van Biljon & Kotzé, 2008). The finding shows that individuals in Jordan feel that the facilitating conditions (external factors) have a significant influence on their decisions towards behavioral intention to use m-commerce.

Facilitating conditions seems to be an important predictor of behavioral intention in Jordan ($\beta = .399$, $p<0.001$). In other terms, mobile phone users view the availability of resources, the availability of knowledge and the presence of facilitating conditions as an essential requirement to adopt m-commerce in Jordan. In this study, it can be concluded that, the perception of facilitating conditions were positively acknowledged and recognized by the respondents in Jordan.

Fourth predictor (H6a): *The effects of personal Innovativeness in IT on behavioral intention.*

Agarwal and Prasad (1998) argued that individuals with higher personal innovativeness in IT (PIIT) are anticipated to build up more positive beliefs regarding the technology. The present research result indicated there is a significant and a positive relationship between PIIT and behavioral intention in Jordan ($\beta = .198$, $p<0.001$). Therefore, H6a is supported. This result aligns with result from a

previous study (Dai & Palvia, 2009), but it is contradictory to the result from other previous study (Lu, et al., 2005).

This result indicated that PIIT is an important factor to predict behavioral intention to adopt m-commerce in Jordan. In other words, the research finding suggests that mobile phone users in Jordan have a high demand for innovation (e.g., m-commerce) which will lead to predict behavioral intention. In addition, this result is confirmed in a recent study (Al-Khasawneh, 2010). Al-Khasawneh found in his study regarding mobile internet adoption that Jordanians exhibited high degree of affinity for new ICT. In other words, this study shows the participants might base their decisions towards behavioral intention to use m-commerce on curiosity and enthusiasm.

Fifth predictor (H8a): *The effects of cost on behavioral intention.*

Cost in this current study has a significant and a negative effect on individual's behavioral intention towards the use of m-commerce in Jordan; hence, the hypothesis H8a is supported. In other words, cost is one of the barriers that prevent Jordanians from adopting m-commerce. The result from this empirical study is consistent with other researcher's findings (Cheong & Park, 2005; Luarn & Lin, 2005; Shin, 2011; Wei, et al., 2009; Wu & Wang, 2005) which identified the negative relationship between cost and behavioral intention. However, this result is contradictory with other studies findings (Koenig-Lewis, et al., 2010; Mallat, et al., 2008).

The result indicated that cost is an important predictor of behavioral intention ($\beta = -.132$, $p<0.01$). It suggests the individual's intention decreases when m-commerce

services are costly. Therefore, in favor of increased diffusion and acceptance of m-commerce in Jordan, prices should be low. The cost can be reduced by promotional plans and developing new pricing strategies (Wei, et al., 2009). It can be concluded that participants show that increasing the cost of equipment (handset), access cost and transaction fees will result in a decrease of the acceptance rate of m-commerce in Jordan.

6.3.2 Findings Related to the Antecedents of Attitude

This study has shown that attitude was directly affected by perceived ease of use (β = .222; $p<0.001$), subjective norm (β = .422; $p<0.001$), facilitating conditions (β = .291; $p<0.001$) and cost (β = -.119; $p < 0.05$) except perceived usefulness (β = .001; $p >0.05$) was found insignificant or H11b, H1a, H7b and H8b were supported with the exception of H10b. Moreover, subjective norm is the most supported (highest beta value) antecedent of attitude followed by facilitating conditions, perceived ease of use and cost respectively. Furthermore, the findings indicated the research model explained (51 %) of the variance in individual's attitude to adopt m-commerce in Jordan. The next sections will discuss the results of the hypotheses in details.

First predictor (H11b): *The effects of p*erceived ease of use *on attitude.*

Empirical evidence from this study shows perceived ease of use has a significantly positive effect on attitude in Jordan (β = .222; $p<0.001$). Therefore, hypothesis H11b is supported. This finding is consistent with those of previous research (Aldás-

Manzano, et al., 2009; Cheong & Park, 2005; Jayasingh & Eze, 2010; Kim, et al., 2009b; Kuo & Yen, 2009; Li, et al., 2007; Liao, et al., 2007; Nysveen, et al., 2005b; Park & Chen, 2007; Raleting & Nel, 2011; Schierz, et al., 2010; Shin, 2009; Shin, 2011; Yang, 2010).

This result indicated that participants adopt more positive attitudes toward the adoption of m-commerce when they perceive higher ease of use of m-commerce systems. In other words, mobile phone users who perceive a higher ease of use of m-commerce systems has a stronger attitude to adopt m-commerce in Jordan. This research suggests that with the increased ease of use of m-commerce applications (systems), the positive attitude among Jordanians would increase and would lead to increased acceptance m-commerce in the country.

Second predictor (H1a): *The effects of subjective norms on attitude.*

Empirical evidence from this study reveals that subjective norm has a significantly positive effect on attitude in Jordan (β = .422; $p<0.001$). It will be discussed in details in the second objective (see section 6.4).

Third predictor (H7b): *The effects of facilitating conditions on attitude.*

In terms of the effect of facilitating conditions on attitude, facilitating conditions are found to be significantly and positively affecting attitude in Jordan (β = .291; $p<0.001$). This means the participants' attitudes in this study are shaped by the level of facilitating conditions in Jordan. This finding echoes results from prior studies by Crabbe et al. (2009) and Teo (2009), which found a relationship between facilitating

conditions and attitude. It can be concluded that participants (mobile phone users) in Jordan who have access to a favorable set of facilitating conditions are more likely to develop a positive attitude towards m-commerce usage.

Fourth predictor (H8b): *The effects of cost on attitude.*

Empirical evidence from this research shows the relationship between cost and attitude is significantly negative ($\beta = -.119$; $p < 0.05$). Therefore, hypothesis H8b is supported. This finding is supported by a number of studies (Cheong & Park, 2005; Kuo & Yen, 2009; Li, et al., 2007; Wessels & Drennan, 2010) which found a negative link between cost and attitude.

This result indicated cost is an important predictor of attitude in Jordan and one of the antecedents of attitude. Furthermore, the findings of this study show that participants' attitudes become more negative when the perceived cost of m-commerce services is higher. This finding is important since TAM research had not accounted for the cost in the model. Although some researchers (Cheong & Park, 2005; Kuo & Yen, 2009; Li, et al., 2007; Wessels & Drennan, 2010) argued the importance of cost in understanding the individuals' attitude of technologies that involved cost by the end-users; the cost factor still has received minimum attention from researchers. It can be concluded that cost is one of the influential predictors of attitude in Jordan. The research suggests having lower prices in order to develop a positive attitude to increase the acceptance of m-commerce in the country.

However, in terms of the effect of perceived usefulness on attitude, consistent with the original TAM hypothesized; this research hypothesized there would be a positive and a significant relationship between perceived usefulness and individual's attitude toward adopting m-commerce in Jordan. Contradictory to the TAM finding and many prior studies, evidence from this study shows that the relationship between perceived usefulness and attitude (H10b) was found not supported to predict attitude. However, this result is in line with other researchers (Chen, et al., 2009; Ha, et al., 2007) which found this relationship not supported. This may be due to of m-commerce being viewed as a new technology in Jordan and participants had no experience or knowledge yet with m-commerce systems functionally (about 80 % never use m-commerce) in order to assess the benefits and the advantages of m-commerce and to build up a positive attitude. This research suggests mobile companies should promote the advantages and the usefulness of m-commerce systems. In addition, mobile IT/IS designers should pay more attention to user requirements analysis to determine their expectations and meet the requirements for m-commerce applications.

6.3.3 Findings Related to the Antecedents of PU

In terms of factors effecting perceived usefulness, perceived usefulness was directly affected by subjective norms ($\beta = .364$; $p<0.001$) and facilitating conditions ($\beta = .182$; $p<0.05$) except perceived use of use ($\beta = .022$; $p>0.05$) and personal innovativeness in IT ($\beta = .114$; $p>0.05$) were not found significant or H1b and H7c

were supported; on the other hand, H11a and H6b were not supported. Furthermore, subjective norm is the most influential predictors followed by facilitating conditions. About 26 % of the variation in perceived usefulness in the model is explained by subjective norm and facilitating conditions. The next sections will discuss the results of the hypotheses in details.

First predictor (H1b): *The effects of subjective norms on perceived usefulness.*

Empirical evidence from this study reveals that subjective norm has a significantly positive effect on perceived usefulness in Jordan (β = .364; $p<0.001$). It will be discussed in details in the second objective (see section 6.4).

Second predictor (H8b): *The effects of facilitating conditions on perceived usefulness.*

The result of this study shows that facilitating conditions have a significantly positive effect on perceived usefulness (β = .182; $p<0.05$). Facilitating conditions refer to "objective factors" that should be "out there'" in the environment, to make an act easy to do (Cheung, Chang, & Lai, 2000). The empirical finding from this study indicated that the facilitating conditions construct is an important factor to predict perceived usefulness in Jordan towards adopting m-commerce. This finding reveals the aspects of facilitating conditions are significantly recognized by the participants in Jordan. This result is consistent with the findings of other studies (Lu, et al., 2008; Raleting & Nel, 2011). According to Lu et al. (2008), facilitating conditions have been recognized as more influential than other factors on acceptance and infusion of

IT/IS innovations. This research suggests that the availability of facilitating conditions will enhance individual capabilities and perceptions. It will also increase their perceptions of system usefulness. In other words, required resources should exist in order to enhance individual perceptions of system usefulness.

However, perceived ease of use ($\beta = .022$; $p>0.05$) and personal innovativeness in IT ($\beta = .114$; $p>0.05$) were found an insignificant predictors of perceived usefulness. Therefore, hypotheses H11a and H6b were not supported. For perceived ease of use, the result of this study is not consistent with the TAM research hypothesized; however, it echoes with the findings of other previous studies (Kim, Choi, & Han, 2009a; Liu & Li, 2011; Rouibah, et al., 2011). This result indicated participants did not recognize that perceived ease of use in m-commerce will enhance their performance. In other terms, the improvement in perceived ease of use may not lead to the improvement in performance among participants in Jordan. Considering the university students from which the sample was drawn, this result may not be surprise. Since the participants are viewed as a young generation (university students) it may be anticipated that the participants have more experience than others with technologies. The participants viewed perceived ease of use as not important to improve the performance of someone‘s job.

In other words, participants who feel that m-commerce services are easy to use cannot perceive a higher usefulness of the services.

In terms of personal innovativeness in IT, the empirical analysis in this study indicated an insignificant relationship between personal innovativeness in IT and

perceived usefulness in Jordan. Thus, H6b is not supported. Researchers argued that individuals with higher levels of innovativeness in IT could be expected to develop positive opinions about the methods in terms of benefits and advantages (perceived usefulness) of the system (Agarwal & Prasad, 1998; Lu, et al., 2005). The majority of potential users in Jordan with the intention to accept (adopt), do not have an abundant information on different mobile data services or have formed obvious perception beliefs due to new services of m-commerce in Jordan (Al-Khasawneh, 2010). The finding is consistent with other results from prior studies (Bhatti, 2007; Kuo & Yen, 2009; Lu, et al., 2008; Lu, et al., 2005) which found no significant link between personal innovativeness in IT and perceived usefulness. It can be concluded that the perceived usefulness of m-commerce does not rise (generate influence) when the participants are willing to try and adopt new things. The research suggests that mobile operators should promote the benefits of m-commerce to help the enthusiastic technology seekers to observe and generate a strong influence on perceived usefulness.

6.3.4 Findings Related to the Antecedents of PEOU

Perceived ease of use was directly affected by subjective norms ($\beta = .167$; $p<0.01$), personal innovativeness in IT ($\beta = .255$; $p<0.001$) and facilitating conditions ($\beta = .242$; $p<0.01$) or H1c, H6c and H7d were supported. Moreover, personal innovativeness in IT is the most influential predictor followed by facilitating conditions and subjective norms. About 24 % of the variation in perceived usefulness

in the model is explained by personal innovativeness in IT, facilitating conditions and subjective norm. The next paragraphs will discuss the results of the hypotheses in detail.

First predictor (H1c): *The effects of subjective norms on perceived ease of use.*

Empirical evidence from this study reveals that subjective norm has a significantly positive effect on perceived ease of use in Jordan ($\beta = .167$; $p<0.01$). It will be discussed in detail in the second objective (see section 6.4).

Second predictor (H6c): *The effects of personal innovativeness in IT on perceived ease of use.*

The result of this study shows that personal innovativeness in IT has a significant and positive effect on perceived use of use in Jordan ($\beta = .255$; $p<0.001$). Therefore, H6c is supported. This empirical finding is consistent with other researchers' findings in their prior studies (Kim, et al., 2010; Kuo & Yen, 2009; Liu & Chen, 2009; Lu, et al., 2008; Lu, et al., 2005; Mao, et al., 2005).

This result indicated that individuals who have the natural tendency to try new technology or who have a higher demand for new things feel that m-commerce services are easy to use. In other terms, the result shows that participants with higher levels of innovativeness found m-commerce to be easy to use.

Third predictor (H7d): *The effects of facilitating conditions on perceived ease of use.*

A significantly positive relationship between facilitating conditions and perceived ease of use has been observed in this study (β = .242; p<0.01). Thus, H7d is supported. This empirical finding is consistent with findings reported in prior studies (Gu, et al., 2009; Raleting & Nel, 2011). Researchers argued that users will perceive m-commerce to be easy to use when they know that there are external environmental conditions to help them learn how to use the system, even though they cannot use it skillfully (Gu, et al., 2009; Raleting & Nel, 2011). Moreover, they believe that facilitating conditions will influence perceived ease of use in a positive way. This result indicated that participants realized the importance of external environmental conditions in order to perceive m-commerce to be easy to use.

6.4 Second Objective: The effects of SN on Attitude, PU and PEOU

The current study shows that subjective norms influencing attitude (β = .422; p<0.001), perceived usefulness (β = .364; p<0.001) and perceived ease of use (β = .167; p<0.01). In this study, the empirical findings are consistent with the study predictions that a positive and direct influence exists in regard to subjective norm over attitude, perceived usefulness and perceived ease of use. Therefore, H1a, H1b and H1c are supported. The next paragraphs discuss each hypothesis.

The effect of subjective norms on attitude (H1a)

Empirical evidence from this study reveals the confirmation of the research hypothesis (H1a). Furthermore, the finding indicated that subjective norms are the

most influential predictors of attitude in Jordan (β = .422; p<0.001). The subjective norms of the decision maker should not be ignored and if the subjective norms (environment or social connections) are in support of adopting a technology, this decision will play a significant role in the decision process of adoption. This result is not included in any of the reviewed TAM studies in chapter two with the exceptions of (López-Nicolás, et al., 2008; Schierz, et al., 2010) which found a positive link between subjective norms and attitude. According to López-Nicolás et al. (2008), individuals who are uncomfortable with uncertainty or uncertainty about their expected consequences will tend to interact with their social network before making a decision.

Furthermore, the magnitude (path coefficient = .422; p<.001) of this finding implies that the influences from different social connections in a collectivist culture are critical determinants of attitude for at least the potential individual adopters of m-commerce in Jordan. In other terms, this finding confirmed that subjective norms in Jordan are highly significant to the participants' attitude due to the high social norms in collectivist cultures.

The effect of subjective norm on perceived usefulness (H1b)

In addition to the effects of subjective norm on attitude, this research is interested to study the effect of subjective norms on perceived usefulness. Empirical evidence found in this study indicated that a significant and positive relationship exist between subjective norms and perceived usefulness in Jordan (β = .364; p<0.001). This confirms that the internalization of subjective norms (Venkatesh & Bala, 2008;

Venkatesh & Davis, 2000) is influencing individuals' evaluation of whether m-commerce services are useful. This finding is in line with other research findings in prior studies (Khalifa & Shen, 2008b; López-Nicolás, et al., 2008; Lu, et al., 2005; Verkasalo, et al., 2010). However, the finding of this study is contrary to others findings (Gu, et al., 2009; Kim, et al., 2009b; Lu, et al., 2008). Although the magnitude (path coefficient = .364; $p<.001$) is less than the effects of subjective norms on attitude (path coefficient = .422; $p<.001$), the finding indicated that social connections in collectivist cultures are critical determinant of the usefulness of m-commerce in Jordan.

The effect of subjective norm on perceived ease of use (H1c)

Besides the effects of subjective norm on attitude and perceived usefulness this research is interested to study the effect of subjective norms on perceived ease of use. In this study, empirical evidence found that a significant and positive relationship exist between subjective norms and perceived ease of use in Jordan ($\beta = .167$; $p<0.01$). This confirms that the internalization of subjective norms is influencing individuals' evaluation of whether m-commerce services are easy to use (Lu, et al., 2005).

Furthermore, this result is consistent with the findings in previous studies (Bhatti, 2007; López-Nicolás, et al., 2008; Lu, et al., 2005). Although the magnitude (path coefficient = .167; $p<.01$) is less than the effects of subjective norms on attitude (path coefficient = .422; $p<.001$) and also less than the effects of subjective norms on perceived usefulness (path coefficient = .364; $p<.001$), the finding indicated that

social connections in collectivist cultures are important determinants of the ease of use and can predict perceived ease of use of m-commerce in Jordan.

In summation, this study theorizes that subjective norms are significant determinants of attitude, perceived usefulness and perceived ease of use. The findings indeed confirmed the existences of these relationships among the participants meaning the importance of subjective norms in Jordan were realized. Individual perceptions of attitude, usefulness and ease of use toward m-commerce are significantly attributed to the subjective norms (social influences). It can be concluded that subjective norms generate an important impact on an individual's attitude and beliefs.

6.5 Third Objective: Findings related to Decomposing SN

The findings in this study indicated that the subjective norms construct is directly affected by the decomposing variables: personal injunctive norm (PIN) (β = .159; $p<0.05$), personal descriptive norm (PDN) (β = .381; $p<0.001$) and societal injunctive norm (SIN) (β = .183; $p<0.05$) except societal descriptive norm (SDN) (β = -.058; $p>0.05$) was not supported. Moreover, personal descriptive norm is the most influential predictor followed by personal injunctive norm and societal injunctive norm. About 32 % of the variation in subjective norms is explained by personal descriptive norm, personal injunctive norm and societal injunctive norm. The next paragraphs discuss each hypothesis.

First predictor (H2): *The effects of PIN on subjective norms.*

Empirical evidence from this study shows that the relationship between personal injunctive norm and subjective norms has significant and positive effects in Jordan ($\beta = .159$; $p<0.05$). Therefore, hypothesis H2 is supported. This finding indicated that personal injunctive norm can predict subjective norms. Moreover, this finding is consistent with Ramayah et al. (2009) study, which found a significant and a positive link between injunctive norm and subjective norms.

This empirical confirmation in this study shows that indeed the participants' belief regarding approval or disapproval of the behavior is in question by those valued others in their social connections in Jordan. Meaning family and friends who are important to the participants on a personal level and their influence are critical in decision making. In other words, approval or disapproval of the behavior on a personal level (personal injunctive norm) has a significant effect on participants' decisions which means that individuals in Jordan are considering people's approval or disapproval of the behavior. At the end, this result confirms the hypothesis in this study that personal injunctive norm is an antecedent of subjective norm and this result is not included in any of the reviewed TAM studies.

Second predictor (H3): *The effects of PDN on subjective norms.*

In this study, empirical evidence shows that the relationship between personal descriptive norm and subjective norms has a significant and a positive effects in Jordan ($\beta = .381$; $p<0.001$). Therefore, hypothesis H3 is supported. This result aligns with Ramayah et al. (2009) study, which found a significant and a positive link between descriptive norm and subjective norms.

Furthermore, the magnitude of personal descriptive injunctive norm (β = .381; p<0.001) is higher than the magnitude of personal injunctive norm (β = .159; p<0.05) which means that participants' decisions based on their personal level is greatly influenced by the important others who performed the behavior in their social connections. The probable reason for this finding is that participants in Jordan observes the important others behavior (perform) more than what others opinions are in regard to approval or disapproval of the behavior. This study implies that performing the behavior is more influential among participants than opinions in making the decision in their social network. At the end, this result confirms the hypothesis in this study that personal descriptive norm is an antecedent of subjective norm and this result is not included in any of the reviewed TAM studies. Moreover, in fact findings show when individuals in Jordan decide to accept m-commerce in Jordan, they consider (perceive) what important others are doing and their opinions on personal level.

Third predictor (H4): *The effects of SIN on subjective norms.*

Indeed the relationship between societal injunctive norm and subjective norm do exist. Empirical evidence in this research has found a significant link between societal injunctive norm and subjective norm in Jordan (β = .183; p<0.05). Park and Smith (2007,p. 196) stated that "there are actual levels of descriptive and injunctive norms among a certain group and in their society, individuals can vary in their perception of those norms that they at both the personal and the societal level". This finding indicated participants are influenced by important others on their societal

level which means that opinions of important other in question of their society is significant and impacts their decisions.

However, contrary to the study prediction, the positive direct influence of societal descriptive norm over subjective norms (H5) is not supported by the study's empirical findings. This may be explained by the fact that when individuals decide to accept m-commerce in Jordan, they perceive important others think they should do, not necessarily what they believe important others are doing on societal level at large.

In summation, this empirical analysis presented a confirmation that personal injunctive norm, personal descriptive norm and societal injunctive norm are distinguished, and they are antecedents of subjective norms. This result was expected. According to Ramayah et al. (2009), social norms score higher in collectivist cultures and these social norms can play a major role in adopting m-commerce. This research suggests that the subjective norms factor was a function of personal and societal levels. For personal injunctive norm, personal descriptive norm and societal injunctive norm are supported in this study. However, societal descriptive norm was found insignificant toward subjective norms.

6.6 Fourth Objective: The Applicability of TAM (Underpinning Theory)

The purpose of the fourth objective is to determine the validity and the applicability of TAM to explain and understand the antecedents of TAM in Jordan. This study

found that the TAM model can explain m-commerce adoption in Jordan very well. This study has validated the TAM model in the context of m-commerce outside the USA. This result is inconsistent with (Almutairi, 2007) study.

According to Table 5.15 (see Chapter 5), the findings show the competing model of TAM has an adequate model fit (Ratio (χ^2/df) = 2.72; RMSEA = 0.66; GFI = .947; CFI =.956; TLI =.941; IFI = .957 and AGFI =.916). In addition, Table 5.16 shows that five hypotheses were tested in TAM (perceived usefulness positively influence attitude, perceived ease of use positively influence attitude, perceived ease of use positively influence perceived usefulness, perceived usefulness positively influence behavioral intention and attitude positively influence behavioral intention). The findings indicated as shown in Table 5.16 that all the above hypotheses were found significant at .001 level. Therefore, these findings assert that TAM can explain m-commerce adoption in Jordan. Furthermore, the squared multiple correlations (R^2) for the TAM model can explain (34%) of the variance in behavioral intention in Jordan. Therefore, by extending and decomposing a research model like TAM, it is possible to demonstrate m-commerce behavioral intention in Jordan.

6.7 Research Contributions

This study is the first study to empirically test determinants of the acceptance of m-commerce in Jordan. This research has made several significant contributions to the m-commerce adoption research and it can be summarized into:

Theoretical Contributions

1. The extension of TAM to include subjective norms, facilitating conditions, cost, and personal innovativeness in IT has enriched the TAM model by increasing its explanatory power.

2. The empirical validation of decomposing subjective norms into: personal and societal levels can add to the body of knowledge of the phenomenon of subjective norms in the technology acceptance theories.

3. The empirical validation of the significant role of subjective norms on attitude as a predictor of individual's intention to adopt m-commerce can add to the body of knowledge of the importance of subjective norms on attitude in the Arab world.

Practical Contributions

1. This study adds to the body of knowledge for the Middle Eastern consumers' behavioral intention. Understanding the adoption of m-commerce is needed to guide future development of m-commerce research in the Arab countries.

2. The findings of this study should help practitioners in the industry to promote the usage of the m-commerce technology in Jordan with the understanding of the mobile phone consumers' views.

3. The findings from this study can help the practitioners in promoting the usage of m-commerce in Jordan.

4. In sum, the findings can help public and private sectors to invest in m-commerce in Jordan based on the knowledge gained from this study results.

6.8 Research Implications

The results of this research contribute to the advancement of m-commerce and to guide management related to m-commerce. It provides policy makers in telecommunication operators with a checklist of factors that appear to affect m-commerce adoption: social influences on many levels, attitude, cost, personal innovativeness of IT, facilitating conditions and technological factors. These checklists should be considered as a cornerstone for future projects in designing mobile applications and promoting m-commerce usage in Jordan. In addition, this study contributes to this field by shedding light on factors that drives or inhibit m-commerce initiatives in Jordan. The findings of this study can guide managers relate to m-commerce from a number of ways:

1. The outcome of this study indicated that significant effects influencing behavioral intention from attitude, facilitating conditions, cost, PIIT and perceived usefulness were observed. The suggestions are developing positive attitude towards m-commerce, increasing the access of a favorable set of facilitating conditions, lowering cost of m-commerce services, identifying information seekers potential adopters and promoting the advantages of m-commerce may increase to the penetration rate of m-commerce in Jordan.

2. Since Jordan is facing a low penetration of m-commerce among mobile phone users, the outcome from this study suggested that managers related to m-commerce should help in developing positive attitude for potential m-commerce adopters. Given one of the effects of attitude on behavioral intention; it is important (significant) for the mobile companies to create positive perceptions. These positive perceptions can increase through the usage of social norms and by focusing on three variables which are personal injunctive norm, personal descriptive norm and societal injunctive norm. Jordan is a collectivist culture and social norms are valued and individual actions are impacted by the important reference groups to whom he/she is identified. These groups include significant and important others such as family, friends, tribe members, and society at large. Therefore, telecommunication operators may use word of mouth as an alternative way to increase the positive attitude among potential m-commerce adopters.
3. Furthermore, outcomes of this study indicated that cost had a negative impact on behavioral intention and attitude. Therefore, it is important to individuals (mobile phone users) that mobile companies provide lower fees and lower costs in order to increase the penetration of m-commerce in the country. One of the ways to lower the cost is by designing a flat rate for mobile phone users to use m-commerce services. Therefore, creative promotions and low pricing strategies are necessary to develop positive attitude which in turn increases m-commerce usage.
4. Moreover, the finding of this study shows that perceived ease of use and facilitating conditions had a positive influence on attitude. Therefore, the research implies that mobile IT/IS designers and mobile companies should provide services

that are easy to use. In addition, the research suggested that mobile companies should provide more support since m-commerce is new in the country such as tutorials to increase the knowledge and provide more support which in turn increases the positive attitude.

5. Finding of this study shows that an individual's perception of ease of use toward m-commerce is significantly attributed to internal enthusiasms to try m-commerce. PIIT is an important internal stimulus influencing perceptions of m-commerce. In addition, PIIT was found to have a direct influence on behavioral intention. It suggested that mobile companies should identify the innovative potential adopter to offer m-commerce services in turn to increase the adoption rate.
6. Finally, the outcomes of this research suggested that mobile companies should pay more attention to the culture in Jordan. The outcomes of this study illustrated the significance of subjective norms and facilitating conditions on perceived usefulness. Therefore, this conclusion reveals that the importance of social influences and facilitating conditions on usefulness. As mentioned earlier, the Arab culture is highly influence by strong social norms. These social norms range from family influence, friends influence, tribes influence and larger circle of important others in the society were observed. It can be concluded that positive perceptions (attitude, perceived usefulness and perceived use of use) can increase through the usage of social norms and by focusing on three variables which are personal injunctive norm, personal descriptive norm and societal injunctive norm.

6.9 Limitations of the Study

This empirical research has four limitations.

1. This study is measuring the "behavioral intention" not the "actual usage", therefore, use behavior is not measured.
2. The research model accounted for only 53 % of the variance in behavioral intention to adopt m-commerce in Jordan.
3. This is cross-sectional research represents a snapshot in time, therefore, a change in individuals' attitude or believes are not captured.
4. This study is limited in its scope as it consists of only university students in Jordan.

Despite the limitations, this study provides valuable knowledge about the potential adopters of m-commerce in Jordan. The acknowledged limitations of this research have led to some suggestions for future research.

6.10 Future Research Direction

Limitations of this research could create some future research directions. Future research could conduct a longitudinal research to capture whether the variables change over time. In addition, future research could examine more factors that may influence m-commerce in Jordan such as trust, hedonic motivation and more personal factors. Moreover, future research could conduct research on more related studies such as m-payments, m-banking and m-governments in Jordan since there are

very few studies in Jordan. Furthermore, one possible future research direction is to conduct a comparative study between Jordan and other countries such as the USA regarding m-commerce adoption to capture the cultural differences between developing and developed countries. This research is based on the TAM model, and future research could use other theoretical frameworks such as UTAUT, UTAUT2 with targeting other subjects besides university students.

Additional research may be conducted to investigate different mediators such as perceived usefulness, perceived ease of use and attitude in the proposed model. Furthermore, this research may also be expanded to include moderators such as age, gender and experience. For example, the effect of cost on behavioral intention and attitude to be moderated by age and gender can be tested. Another example is the effect of attitude on behavioral intention moderated by age, gender and experience.

6.11 Conclusion

This research investigated the influencing factors that are contributing to the behavioral intention to adopt m-commerce in Jordan. The researcher extended TAM successfully by incorporating subjective norms, cost, facilitating condition and PIIT. The findings show that attitude, perceived usefulness, cost, facilitating conditions and PIIT are significant determinants of behavioral intention to adopt m-commerce. This study, addresses the subjective norms in a collectivist culture, as social norms are highly valued. Also, in this study, the researcher argued that subjective norms need to be decomposed to capture more referent sources (salient referents) in collectivist cultures (such as in Jordan).

The empirical findings showed the significance of decomposing subjective norms into personal injunctive norm, personal descriptive norm and societal injunctive norm. In the Arab culture, personal norms and social norms should be viewed as significant antecedents of subjective norms. In addition, the study findings showed the importance of the role of subjective norms on attitude, perceived ease of use and perceived usefulness. The results indicated that subjective norms should be viewed as antecedents of attitude, perceived ease of use and perceived usefulness. In other terms, the results of this study show that subjective norms exert an important influence on people's attitude, perceived ease of use and perceived usefulness to adopt m-commerce.

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APPENDICES

Appendix A:

List of the studies

Studies/New factors	SN / SI	PBC	FC	SE	Image	Anx	PP	PE	Com	Tri	Obs	PIIT	PC	PV	Trust	PR
Yang (2005)												+				
Wu and Wang (2005)									+				+			+
Mallat et al. (2009)									+							
Shin (2009)	+			+											+	
Lu et al. (2005)	+											+				
Liu and Li (2011)								+								
Lopez Nicolas et al.(2008)	+															
Kuo and Yen (2009)												+	+			
Ha,Yoon and Choi (2007)								+								
Kim, Mirusmonov & Lee (2010)									+			+				
Gu, Lee and Suh (2009)	+		+	+											+	
Lu et al. (2008)	+		+									+			+	
Lu, Deng and Wang (2010)								+					+			
Luarn and Lin (2005)				+									+			
Kim, Choi and Han (2009)								+					+			
Chen ,Yen and Chen (2009)				+					+	+	+					
Nysveen, et al. (2005b)	+	+						+								
Li, Fu and Li (2007)									+			+	+			
Yang (2010)				+								+				
Khalifa and Shen (2008b)	+			+												
Liu and Chen(2009)	+	+										+				+
Sripalawat et al. (2011)	+			+									+			+
Wu, Wang and Lin (2007)				+					+							
Liao,Tsou and Huang (2007)								+								
Wang, Lin and Luarn (2006)				+												
Yaseen and Zayed (2010)	+												+		+	
Zhang and Mao (2008)	+			+											+	

Raleting and Nel (2011)			+	+									+			+
Jayasingh and Eze (2010)	+								+			+				
Suki (2011)								+								
Chong, Darmawan, Ooi and Lee (2010)	+			+				+					+			
Koenig-Lewis, Palmer and Moll (2010)									+				+		+	+
Mallat et al. (2008)	+								+				+		+	+
Dai and Palvia (2009)	+							+	+			+	+	+		
Bhatti (2007)	+	+										+				
Mao et al. (2005)				+								+	+			
Kim, Ma and Park (2009)	+							+								
Nysveen, et al. (2005a)	+							+								
Liang and Yeh (2011)	+						+									
Wei et al. (2009)	+												+		+	
Shin (2011)	+								+				+			
Schierz, Schilke and Wirtz (2010)	+								+							
Cheong and Park (2005)							+						+			
Hong and Tam (2006)	+							+								
Wessels and Drenan (2010)									+				+			+
Lu and Su (2009)						+		+	+							
Aldas-Manzano, Mafe ´and Blas (2009)									+			+				
Park and Chen (2007)				+						+	+					
Verkasalo et al. (2010)	+	+						+								
Crabbe et al. (2009)			+													

Notes: The mark (+) , means new factor used in this study.
Subjective norm (SN) Social influence (SI), Perceived behavioral control (PBC), Facilitating conditions (FC), Self efficacy (SE), Anxiety (Anx), Perceived playfulness (PP), Perceived enjoyment (PE), Compatibility (Com), Trainability (Tri), Observability (Obs),Personal innovativeness in IT(PIIT), Perceived cost (PC), Perceived value (PV), Perceived risk (PV).

Appendix B:

Survey (English Version)

M-commerce Acceptance in Jordan

Please, read the introduction, so you can fill the survey in the appropriate way.

Definition of M-commerce: is buying and selling of goods and services through mobile phone.
Examples: Flight booking, hotels, buy ringtones, access to financial news, sports, weather , conduct banking transactions , speculation in the stock market, payment of invoices , change type of services , transfer money from one account to another , conduct banking operations like 'Express' SMS from the Arab Bank , use of the Internet and use the e-mail.
Thank you for participating in our survey. Please respond to all of the questions. Your responses are confidential, and will be used in an academic study ONLY.

Ghassan M. Alnajjar
UUM-Malaysia

	Demographic Information				
1.	Age: ---------- Years				
2.	Gender	□ Male	□ Female		
3.	Education Student Level	□ Undergraduate	□ Postgraduate		
4.	Years of Internet Experience	□ Less than 1 year	□ 1-5 years	□ 6-10 years	□ More than 10 years
5.	Hours of usage of Internet Daily	□ Less than 1 hour	□ 1-3 hours	□ 4-7 hours	□ More than 7 hours
6.	Do You Have Mobile Phone?	□ Yes	□ No (If No, Please do not continue this survey. Thank you)		
7.	Years of Mobile phone Usage	□ Less than 1 year	□ 1-2 years	□ 3-4 years	□ More than 4 years
8.	Are you aware of M-commerce?	□ Yes	□ No		
9.	Are you into:	□ Prepaid	□ Monthly bill		
10.	Have you purchased something by mobile phone?	□ Yes	□ No		
11.	Expenditure for mobile phone usage per month	□ Under 10 JD	□ 10-30 JD	□31-50 JD	□ Over 50 JD

When answering the following questions please circle the appropriate answer

Example:	I believe I will use mobile commerce in the future.	Strongly Disagree (SD) **1**	**2**	Disagree (D) **3**	Undecided (U) **4**	Agree (A) **5**	**6**	Strongly Agree (SA) **7**

		(SD)		(D)	(U)	(A)		(SA)
		1	**2**	**3**	**4**	**5**	**6**	**7**
1.	I feel using m-commerce is a wise idea	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	I feel using m-commerce is a good idea	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	I like to use m-commerce	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	Most people who are important to me would think that using the m-commerce is a good idea	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	Most people who influence my behaviour think that I should use m-commerce	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	Most people who are important to me would think I should use m-commerce	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	My family who are important to me would think that using m-commerce is a good idea	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	My family who are important to me would think that I should use m-commerce	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	Using m-commerce saves time	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	Using m-commerce can help me to accomplish tasks more quickly	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	Using m-commerce would improve my performance in my daily life.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12.	Using m-commerce would enhance my effectiveness in my daily life.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	In general, I believe m-commerce will be useful	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14.	Learning to use the m-commerce would be easy for me	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	It would be easy for me to become skilful at using m-commerce	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	I would find the m-commerce easy to use	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	Most people who are important to me have talked with their family about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	Most people whose opinion I value have talked with their family about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19.	Most people who are important to me had family discussion about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20.	I have the resources necessary to use m-commerce	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21.	I have the knowledge necessary to use m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

22.	For me, being able to use m-commerce when I need it is important	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23.	Most people whose opinion I value would approve of my talking with my family about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24.	Most people who are important to me would endorse my talking with my family about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25.	Most people who are important to me would support that I express to my family my opinions about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	If I heard about a new information technology, I would look for ways to experiment with it.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27.	Among my peers, I am usually the first to explore new information technologies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28.	I like to experiment with new information technologies.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
29.	A majority of people in Jordan approve of talking with family about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
30.	A majority of people in Jordan endorse family discussion about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
31.	A majority of people in Jordan support that individuals express to their family their wishes to be m-commerce users.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
32.	I think the equipment cost is expensive for using m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
33.	I think the access cost is expensive for using m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
34.	I think the transaction fee is expensive for using m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
35.	A majority of people in Jordan have talked with their family about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
36.	A majority of people in Jordan have expressed to their family their wishes to be m-commerce users.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
37.	A majority of people in Jordan have engaged in family discussion about m-commerce.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
38.	Assume that I have access to mobile commerce systems, I intent to use them	**1**	**2**	**3**	**4**	**5**	**6**	**7**
39.	I believe I will use mobile commerce in the future.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
40.	I believe my interest towards mobile commerce will increase in the future.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Appendix C:

Survey (Arabic Version)

موقف الاردن من التجارة الإلكترونية عبر الهاتف الخلوي

ملحوظة هامة : ارجو قراءة المقدمة حتى تتمكن من تعبئة الاستبيان كما ينبغي.

تعريف التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي: هي عبارة عن شراء وبيع السلع والخدمات عبر الهاتف الخلوي.

امثلة : حجز الطيران والفنادق وشراء النغمات والحصول على الأخبار المالية والرياضية وأخبار الطقس وإجراء العمليات البنكية والمضاربة في سوق الأسهم ودفع ومراجعة الفواتير وإجراء تغيير في نوع الخدمات وتحويل المبالغ المالية من حساب إلى اخر وإجراء العمليات البنكية.
كخدمة SMS 'إكسبرس'من البنك العربي واستخدام الانترنت و البريد الإلكتروني عبرالهاتف الخلوي.

سوف يستخدم هذا الاستبيان لأغراض البحث العلمي **فقط** . يرجى الإجابة عن **جميع الأسئلة** . شكرا لمساهمتك في هذه الدراسة .

الباحث غسان محمد النجار
جامعة اوتارا- ماليزيا

المعلومات الديموغرافية				
.1	العمر: -------- عاماً			
.2	الجنس:	□ ذكر	□ أنثى	
.3	المستوى التعليمي الجامعي :	□ سنه ١- سنه ٤	□ دراسات عليا	
.4	كم عدد سنوات استخدامك للانترنت ؟	□ أقل من سنه	□ من ١ - ٥ سنوات	□ من ٦ - ١٠ سنوات □ اكثرمن ١٠سنوات
.5	كم عدد ساعات استخدامك للانترنت يوميا ؟	□ أقل من ساعة	□ من ١-٣ ساعات	□ من ٤-٧ ساعات □ اكثرمن ٧ ساعات
.6	هل تملك هاتفاً خلوياً ؟	□ نعم	□ لا اذا كانت اجابتك لا، الرجاء عدم اكمال الاستبيان	
.7	كم عدد سنوات استخدامك للهاتف الخلوي ؟	□ أقل من سنه	□ من سنه - سنتين	□ من ٣- ٤ سنوات □ اكثر من ٤ سنوات
.8	هل أنت على علم بالتجارة الإلكترونية عبر الخلوي ؟	□ نعم	□ لا	
.9	إستخدام الهاتف الخلوي عن طريق:	□ البطاقات المدفوعة مسبقا	□ الفاتورة الشهرية	
.10	هل سبق وإشتريت شيئاً عبر الهاتف الخلوي ؟	□ نعم	□ لا	
.11	كم هى نفقاتك لاستخدام الهاتف الخلوي شهريا ؟	□ أقل من ١٠ دنانير	□ من ١٠-٣٠ دينار	□ من ٣١-٥٠ دينار □ اكثر من٥٠ ديناراً

يرجى وضع (دائرة) حول الإجابة المختارة:

مثال	أعتقد أنني سوف إستخدم التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي في المستقبل .	غير موافق بشدة 1	2	غير موافق 3	غير متأكد 4	موافق 5	6	موافق بشدة 7

		غير موافق بشدة 1	2	غير موافق 3	غير متأكد 4	موافق 5	6	موافق بشدة 7
.1	أشعر أن إستخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي هي فكرة حكيمة	1	2	3	4	5	6	7
.2	أشعر أن إستخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي هي فكرة جيدة	1	2	3	4	5	6	7
.3	أحب إستخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.4	يرى معظم الناس الذين هم مهمين بالنسبة لي أن التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي هي فكرة جيدة	1	2	3	4	5	6	7
.5	يرى معظم الناس الذين لهم تاثير على سلوكي بأنه يتوجب علي استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.6	يرى معظم الناس الذين هم مهمين بالنسبة لي أنه يتوجب علي استخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.7	يرى أفراد عائلتي الذين هم مهمين بالنسبة لي أن التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي هي فكرة جيدة	1	2	3	4	5	6	7
.8	يرى أفراد عائلتي الذين هم مهمين بالنسبة لي أنه يتوجب علي استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.9	استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي يوفر الوقت	1	2	3	4	5	6	7
.10	استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي سوف يساعدني في الوصول الى الخدمات بسرعة اكبر من الطرق التقليدية	1	2	3	4	5	6	7
.11	استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي سيطور من ادائي في حياتي اليومية	1	2	3	4	5	6	7
.12	استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي سيمكنني من الوصول الى الخدمات بفاعلية في حياتي اليومية	1	2	3	4	5	6	7
.13	بصفة عامة ، أعتقد أن التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي سوف تكون مفيدة في حياتي اليومية	1	2	3	4	5	6	7
.14	أشعر أن تعلم استخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي سهلة بالنسبة لي	1	2	3	4	5	6	7
.15	سيكون من السهل بالنسبة لي أن اصبح ماهرا في استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.16	أجد أن التجارة الإلكترونية (الخدمات الإلكترونية)عبر الخلوي سهلة الاستخدام	1	2	3	4	5	6	7
.17	تحدث معظم الناس الذين هم مهمين بالنسبة لي، مع أسرهم بخصوص التجارة الإلكترونية (الخدمات الإلكترونية)عبر الخلوي	1	2	3	4	5	6	7
.18	تحدث معظم الناس الذين أقدر رأيهم، مع أسرهم حول التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.19	قام معظم الناس الذين هم مهمين بالنسبة لي، بمناقشة عائلاتهم بخصوص استخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.20	لدي الموارد اللازمة (من الوقت والمال) لاستخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.21	لدي المعرفة اللازمة لاستخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.22	استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي في اي وقت أريده ، مهم بالنسبة لي	1	2	3	4	5	6	7
.23	سيوافقني معظم الناس الذين أقدر رأيهم، حديثي مع أسرتي حول التجارة استخدام الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7

.24	سيؤيد معظم الناس الذين هم مهمين بالنسبة لي، حديثي مع أسرتي بخصوص استخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.25	سيدعمني معظم الناس الذين هم مهمين بالنسبة لي، تعبيري عن آرائي لأسرتي بخصوص استخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.26	أحب أن أجرب الأنواع الجديدة من تكنولوجيا المعلومات كلما سمعت بها	1	2	3	4	5	6	7
.27	لي السبق بين أصدقائي في البحث عن كل ما هو جديد فيما يخص التكنولوجيا الجديدة	1	2	3	4	5	6	7
.28	أحب تجربة كل ما هو جديد في مجال التكنولوجيا الحديثة	1	2	3	4	5	6	7
.29	يوافق غالبية الناس في الأردن على التحدث مع عائلاتهم حول استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.30	تؤيد غالبية الناس في الأردن أجراء مناقشات عائلية بخصوص استخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.31	تدعم غالبية الناس في الأردن الأفراد الذين أعربوا لأسرهم عن رغباتهم بأن يكونوا من مستخدمي التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.32	أجد أن تكلفة جهاز الهاتف الخلوي مكلفة لاستخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.33	أجد أن تكلفة الوصول إلى استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي مكلفة	1	2	3	4	5	6	7
.34	أجد أن تكلفة رسوم المعاملات لاستخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي مكلفة	1	2	3	4	5	6	7
.35	تحدث غالبية الناس في الأردن مع عائلاتهم حول استخدام التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.36	أعربت غالبية الناس في الأردن لعائلاتهم عن رغباتهم بأن يكونوا من مستخدمي التجارة الإلكترونية(الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.37	شاركت غالبية الناس في الأردن في الحديث مع عائلاتهم حول استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي	1	2	3	4	5	6	7
.38	أنوي استخدام التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي لو قدر لي الوصول الى أنظمتها و أجهزتها	1	2	3	4	5	6	7
.39	أعتقد أنني سوف إستخدم التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي في المستقبل	1	2	3	4	5	6	7
.40	أعتقد أن اهتمامي نحو التجارة الإلكترونية (الخدمات الإلكترونية) عبر الخلوي سوف يزداد في المستقبل	1	2	3	4	5	6	7

Appendix D:

Outlier’s Detection

Observation number	Mahalanobis d-squared	p1	p2
112	153.587	.000	.000
217	130.298	.000	.000
377	130.148	.000	.000
320	125.336	.000	.000
243	119.247	.000	.000
399	118.129	.000	.000
212	112.364	.000	.000
210	105.589	.000	.000
38	100.420	.000	.000
84	99.800	.000	.000
219	98.095	.000	.000
198	91.249	.000	.000
372	91.018	.000	.000
159	90.326	.000	.000
309	89.069	.000	.000
398	88.902	.000	.000
107	82.562	.000	.000
143	82.329	.000	.000
208	79.941	.000	.000
95	79.400	.000	.000
305	78.806	.000	.000
230	75.758	.000	.000
57	74.760	.000	.000
105	74.584	.000	.000
209	74.459	.000	.000
306	73.807	.000	.000
373	70.699	.000	.000
319	69.362	.001	.000
161	68.849	.001	.000
191	68.049	.001	.000
331	67.067	.001	.000
207	66.254	.002	.000
233	65.933	.002	.000
126	65.925	.002	.000
290	65.496	.002	.000
151	65.312	.002	.000
184	64.745	.002	.000
316	63.169	.003	.000
99	62.885	.004	.000
259	62.768	.004	.000
261	62.557	.004	.000

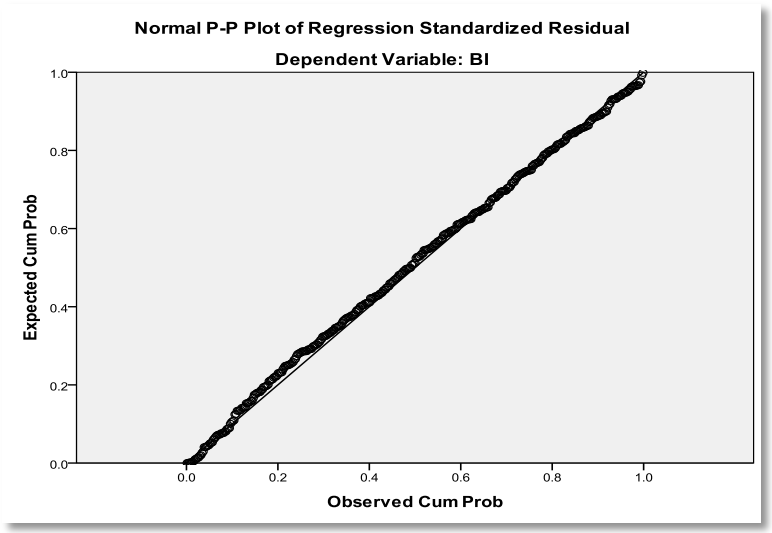
Observation number	Mahalanobis d-squared	p1	p2
157	62.507	.004	.000
387	62.507	.004	.000
182	61.967	.005	.000
145	61.861	.005	.000
172	61.682	.005	.000
260	61.637	.005	.000
58	61.432	.005	.000
73	60.366	.007	.000
229	60.298	.007	.000
144	60.117	.007	.000
202	59.579	.008	.000
380	59.473	.008	.000
239	59.429	.008	.000
310	58.151	.011	.000
171	58.015	.011	.000
187	57.876	.012	.000
162	57.253	.014	.000
29	57.122	.014	.000
5	56.595	.016	.000
4	56.350	.017	.000
302	55.722	.019	.000
232	54.979	.022	.000
2	54.635	.024	.000
242	54.546	.024	.000
74	54.383	.025	.000
82	54.265	.026	.000
148	54.235	.026	.000
379	54.137	.027	.000
396	53.930	.028	.000
54	53.775	.029	.000
123	53.391	.031	.000
125	53.236	.032	.000
160	53.210	.032	.000
41	53.067	.033	.000
317	52.528	.037	.000
374	52.401	.038	.000
409	52.266	.039	.000
350	52.255	.039	.000
369	52.189	.040	.000
85	52.132	.040	.000
313	52.082	.040	.000

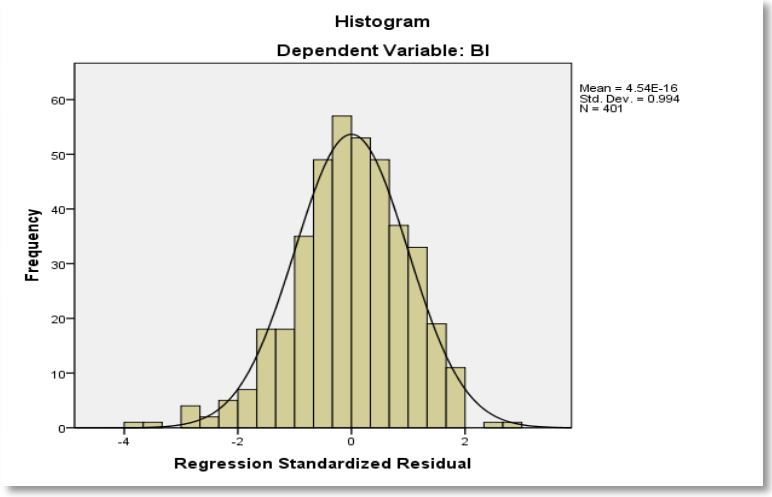
Observation number	Mahalanobis d-squared	p1	p2
382	52.045	.041	.000
222	52.022	.041	.000
50	51.901	.042	.000
262	51.562	.045	.000
138	51.498	.045	.000
121	50.943	.051	.000
22	50.636	.054	.000
258	50.591	.054	.000
346	49.775	.063	.000
257	49.601	.065	.000
375	49.564	.066	.000
136	49.268	.069	.000
275	49.083	.072	.000
307	48.751	.076	.000
378	48.647	.078	.000
180	48.451	.080	.000
23	48.420	.081	.000
393	48.227	.084	.000

Appendix E:

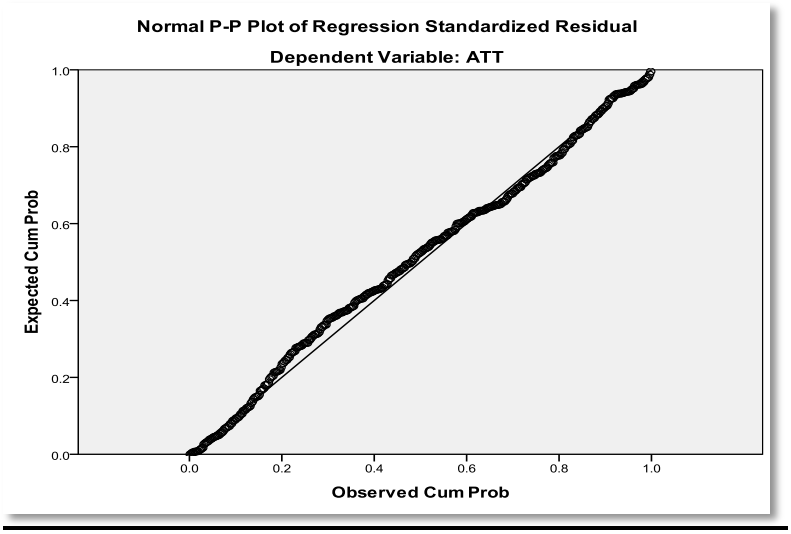
Linearity and Normality

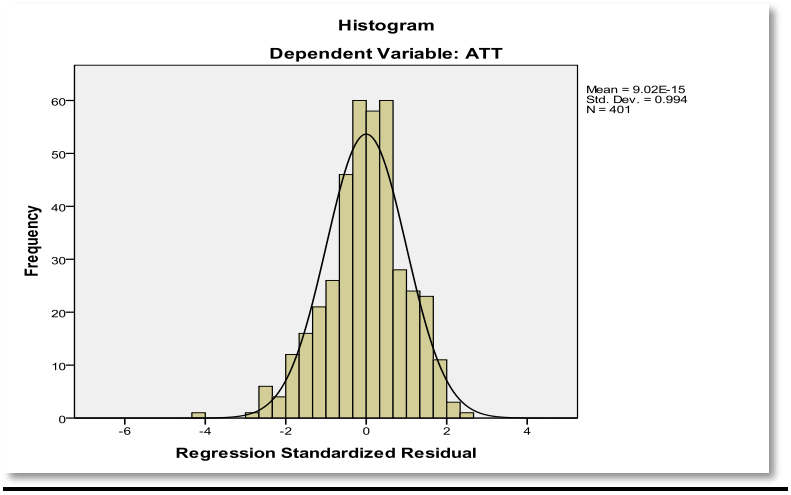
Behavioral Intention



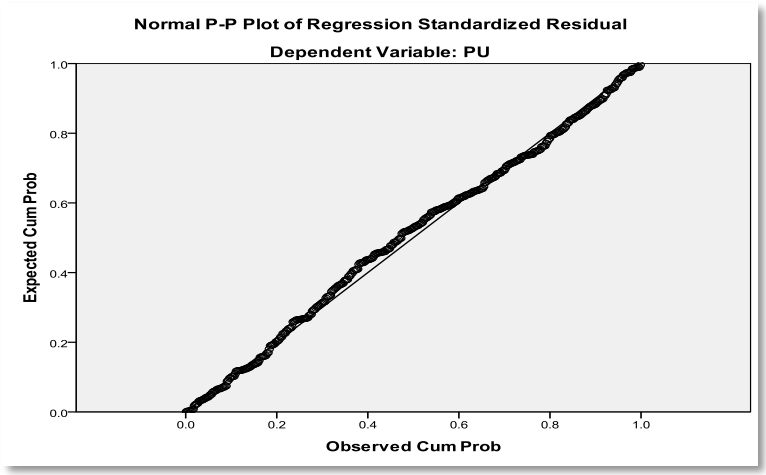


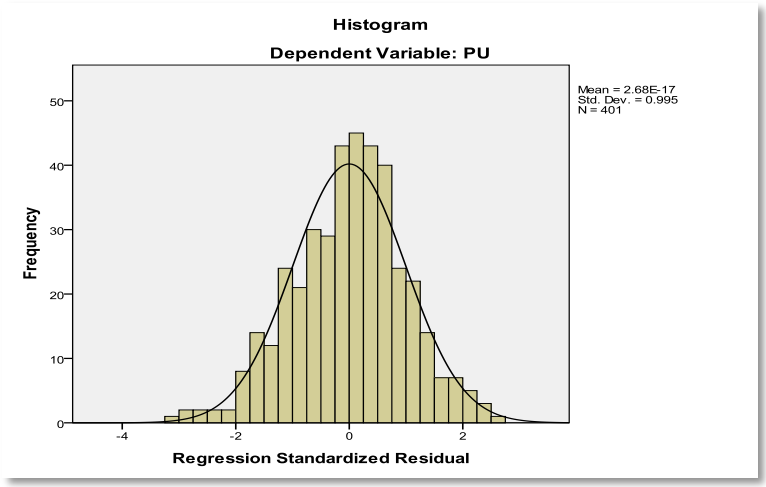
Attitude


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: ATT
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0

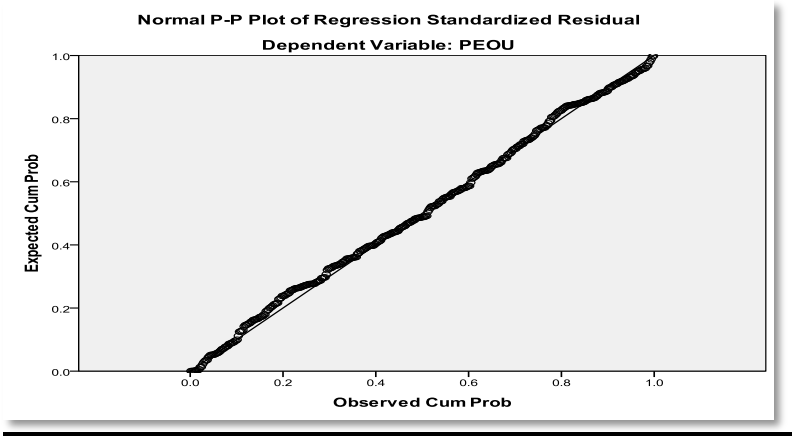

Histogram
Dependent Variable: ATT
Mean = 9.02E-15
Std. Dev. = 0.994
N = 401
Frequency
Regression Standardized Residual
0
10
20
30
40
50
60
-6
-4
-2
0
2
4

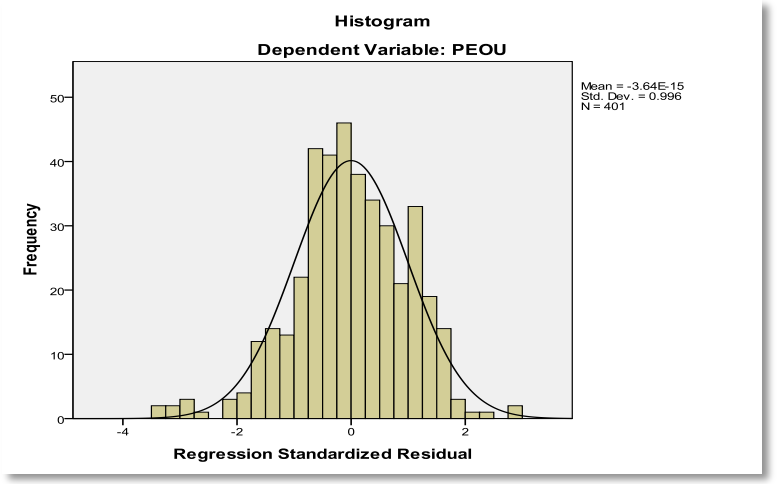
Perceived Usefulness



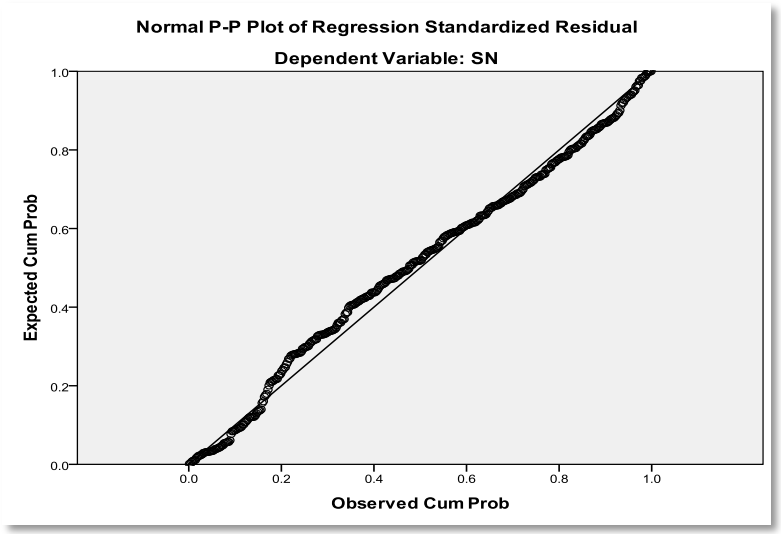


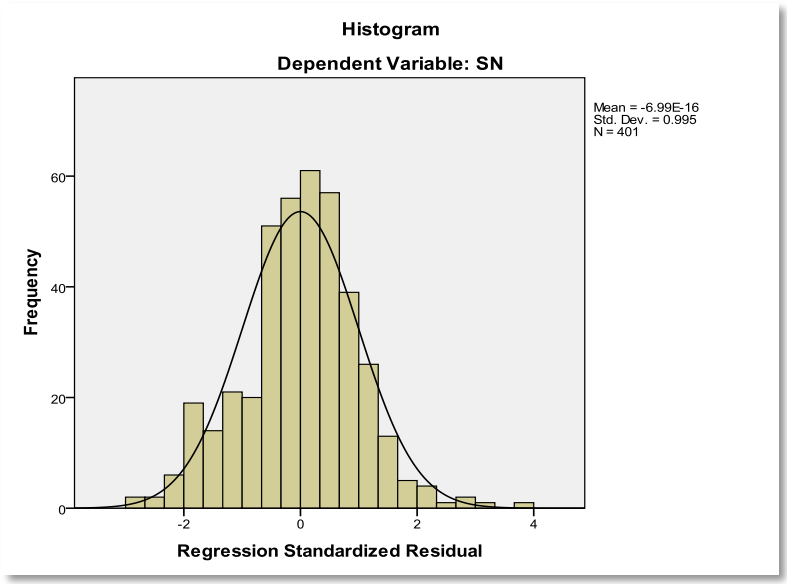
Perceived Use of Ease





Subjective Norms





Appendix F:

Descriptive Statistics

N= 401	Mean	Std. Deviation	Variance	Skewness	Kurtosis	Minimum	Maximum
PU1	4.65	1.508	2.273	-.465	-.181	1	7
PU2	4.39	1.476	2.179	-.340	-.361	1	7
PU3	4.14	1.433	2.054	-.150	-.355	1	7
PU4	5.41	1.240	1.537	-.617	.473	1	7
PU5	5.32	1.187	1.410	-.739	1.172	1	7
At1	4.70	1.444	2.085	-.818	.319	1	7
At2	4.96	1.287	1.656	-.977	1.246	1	7
At3	4.31	1.547	2.393	-.380	-.418	1	7
SN1	4.47	1.362	1.855	-.365	-.081	1	7
SN2	4.46	1.328	1.764	-.720	.462	1	7
SN3	4.04	1.467	2.151	-.266	-.434	1	7
SN4	4.20	1.442	2.079	-.283	-.333	1	7
SN5	4.31	1.388	1.926	-.424	-.089	1	7
C1	3.27	1.481	2.193	.388	-.228	1	7
C2	3.21	1.490	2.220	.448	-.200	1	7
C3	3.23	1.454	2.115	.420	-.048	1	7
PEOU1	5.34	1.353	1.830	-.797	.896	1	7
PEOU2	5.44	1.216	1.477	-.523	.167	1	7
PEOU3	5.25	1.191	1.419	-.408	.068	2	7
PDN1	4.07	1.412	1.993	-.398	-.088	1	7
PDN2	4.09	1.371	1.881	-.400	.003	1	7
PDN3	4.08	1.370	1.876	-.243	.050	1	7
FC1	4.74	1.288	1.660	-.639	.739	1	7
FC2	4.43	1.436	2.061	-.522	.027	1	7
PIN1	4.54	1.264	1.599	-.479	.523	1	7
PIN2	4.57	1.239	1.536	-.467	.466	1	7
PIN3	4.63	1.265	1.599	-.556	.642	1	7
PIIT1	5.59	1.374	1.888	-.881	.432	1	7
PIIT2	5.27	1.441	2.077	-.756	.275	1	7
PIIT3	5.70	1.326	1.759	-1.045	1.094	1	7
SIN1	4.26	1.337	1.788	-.331	.474	1	7
SIN2	4.30	1.330	1.769	-.448	.470	1	7
SIN3	4.36	1.393	1.941	-.442	.267	1	7
SDN1	3.88	1.468	2.156	-.163	-.152	1	7
SDN2	4.05	1.328	1.763	-.279	.107	1	7
SDN3	3.99	1.345	1.810	-.304	.095	1	7
BI1	4.96	1.283	1.646	-.820	1.189	1	7
BI2	5.29	1.281	1.640	-.606	.404	1	7
BI3	5.43	1.323	1.751	-.793	.837	1	7

Appendix G:

Multicollinearity Testing

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	ATT	.716	1.396
	PU	.747	1.338
	FC	.809	1.236
	PITT	.844	1.184
	Cost	.955	1.047

Dependent Variable: BI

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	FC	.851	1.175
	Cost	.972	1.028
	PEOU	.866	1.155
	PU	.751	1.331
	SN	.758	1.319

Dependent Variable: ATT

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	FC	.829	1.206
	PEOU	.838	1.193
	SN	.877	1.140
	PITT	.835	1.197

Dependent Variable: PU

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	FC	.847	1.181
	SN	.900	1.111
	PITT	.893	1.120

Dependent Variable: PEOU

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	PDN	.732	1.366
	PIN	.663	1.508
	SDN	.682	1.466
	SIN	.609	1.643

Dependent Variable: SN

Appendix H:

Independent Samples T-test

Behavioral Intention

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
BI	1	200	5.31	1.065	.075
	2	201	5.14	1.199	.085

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
BI	Equal variances assumed	.362	.548	1.566	399	.118	.177	.113	-.045	.400
	Equal variances not assumed			1.566	394.029	.118	.177	.113	-.045	.400

Attitude

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
ATT	1	200	4.69	1.150	.081
	2	201	4.62	1.222	.086

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ATT	Equal variances assumed	3.177	.075	.645	399	.519	.076	.119	-.157	.309
	Equal variances not assumed			.645	397.785	.519	.076	.118	-.157	.309

Appendix I:

Constructs Reliability Testing

Attitude

```
RELIABILITY
  /VARIABLES=At1 At2 At3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE CORR
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.773	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
At1	9.27	5.972	.651	.468	.644
At2	9.01	6.627	.660	.470	.649
At3	9.66	6.189	.529	.280	.791

Subjective Norms

```
RELIABILITY
  /VARIABLES=SN1 SN2 SN3 SN4 SN5
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.835	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SN1	17.00	19.825	.640	.801
SN2	17.02	20.247	.622	.806
SN3	17.44	19.432	.608	.810
SN4	17.28	18.978	.668	.793
SN5	17.16	19.628	.642	.800

Perceived Usefulness

```
RELIABILITY
  /VARIABLES=PU1 PU2 PU3 PU4 PU5
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.783	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PU1	19.26	16.539	.531	.755
PU2	19.52	15.325	.677	.701
PU3	19.78	16.880	.543	.749
PU4	18.50	18.536	.492	.764
PU5	18.59	18.148	.570	.742

Perceived Ease of Use

```
RELIABILITY
  /VARIABLES=PEOU1 PEOU2 PEOU3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.819	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PEOU1	10.70	4.587	.690	.737
PEOU2	10.59	5.162	.684	.741
PEOU3	10.79	5.394	.651	.773

Personal Descriptive Norm

```
RELIABILITY
  /VARIABLES=PDN1 PDN2 PDN3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.868	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PDN1	8.18	6.271	.761	.802
PDN2	8.15	6.218	.811	.756
PDN3	8.16	6.906	.676	.878

Facilitating Conditions

```
RELIABILITY
  /VARIABLES=FC1 FC2
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.614	2

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation
FC1	4.43	2.061	.446
FC2	4.74	1.660	.446

Personal Injunctive Norm

```
RELIABILITY
  /VARIABLES=PIN1 PIN2 PIN3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.874	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PIN1	9.20	5.399	.740	.839
PIN2	9.17	5.308	.788	.795
PIN3	9.11	5.370	.746	.833

Personal Innovativeness in IT

```
RELIABILITY
  /VARIABLES=PIIT1 PIIT2 PIIT3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.850	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PIIT1	10.97	6.572	.675	.832
PIIT2	11.29	6.111	.706	.806
PIIT3	10.86	6.259	.783	.733

Societal Injunctive Norm

```
RELIABILITY
  /VARIABLES=SIN1 SIN2 SIN3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.877	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SIN1	8.66	6.490	.728	.857
SIN2	8.62	6.136	.809	.785
SIN3	8.56	6.107	.753	.835

Cost

```
RELIABILITY
  /VARIABLES=C1 C2 C3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.879	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
C1	6.44	7.382	.770	.826
C2	6.51	6.956	.840	.761
C3	6.48	7.965	.694	.892

Societal Descriptive Norm

```
RELIABILITY
  /VARIABLES=SDN1 SDN2 SDN3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Reliability Statistics

Cronbach's Alpha	N of Items
.879	3

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SDN1	8.04	6.288	.733	.864
SDN2	7.87	6.538	.816	.787
SDN3	7.93	6.740	.757	.837

Behavioal Intention

```
RELIABILITY
  /VARIABLES=BI1 BI2 BI3
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE
  /SUMMARY=TOTAL.
```

Reliability Statistics

Cronbach's Alpha	N of Items
.850	3

Case Processing Summary

		N	%
Cases	Valid	401	100.0
	Excluded[a]	0	.0
	Total	401	100.0

a. Listwise deletion based on all variables in the procedure.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
BI1	10.72	5.844	.666	.840
BI2	10.39	5.453	.757	.754
BI3	10.24	5.360	.736	.774

Appendix J:

Exploratory Factor Analysis (EFA)

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.859
Bartlett's Test of Sphericity	Approx. Chi-Square	7955.923
	df	630
	Sig.	.000

Communalities

	Initial	Extraction
At1	1.000	.756
At2	1.000	.775
At3	1.000	.560
SN1	1.000	.712
SN2	1.000	.716
SN3	1.000	.663
SN4	1.000	.662
SN5	1.000	.647
PU1	1.000	.553
PU2	1.000	.768
PU3	1.000	.682
PU4	1.000	.586
PU5	1.000	.602
PEOU1	1.000	.740
PEOU2	1.000	.734
PEOU3	1.000	.704
PDN1	1.000	.810
PDN2	1.000	.833
PDN3	1.000	.705
FC1	1.000	.758
FC2	1.000	.689
PIN1	1.000	.796
PIN2	1.000	.829
PIN3	1.000	.805
PIIT1	1.000	.726
PIIT2	1.000	.769
PIIT3	1.000	.833
SIN1	1.000	.766
SIN2	1.000	.838
SIN3	1.000	.784
C1	1.000	.813
C2	1.000	.877
C3	1.000	.756
SDN1	1.000	.792
SDN2	1.000	.851
SDN3	1.000	.802

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.511	26.419	26.419	9.511	26.419	26.419	2.972	8.255	8.255
2	3.213	8.924	35.343	3.213	8.924	35.343	2.613	7.259	15.514
3	2.471	6.864	42.207	2.471	6.864	42.207	2.594	7.205	22.720
4	2.179	6.052	48.259	2.179	6.052	48.259	2.589	7.190	29.910
5	1.654	4.595	52.854	1.654	4.595	52.854	2.523	7.009	36.919
6	1.592	4.423	57.277	1.592	4.423	57.277	2.505	6.958	43.876
7	1.548	4.300	61.576	1.548	4.300	61.576	2.504	6.954	50.830
8	1.294	3.595	65.172	1.294	3.595	65.172	2.404	6.677	57.507
9	1.157	3.215	68.386	1.157	3.215	68.386	2.340	6.499	64.007
10	1.055	2.932	71.318	1.055	2.932	71.318	2.170	6.026	70.033
11	1.014	2.817	74.135	1.014	2.817	74.135	1.477	4.102	74.135
12	.808	2.246	76.381						
13	.686	1.904	78.285						
14	.666	1.850	80.135						
15	.610	1.696	81.831						
16	.551	1.530	83.361						
17	.513	1.426	84.787						
18	.473	1.314	86.102						
19	.435	1.209	87.311						
20	.403	1.120	88.431						
21	.397	1.104	89.535						
22	.373	1.037	90.573						
23	.353	.981	91.554						
24	.342	.951	92.505						
25	.311	.865	93.370						
26	.290	.805	94.175						
27	.266	.738	94.913						
28	.261	.726	95.639						
29	.247	.687	96.326						
30	.240	.668	96.994						
31	.228	.635	97.628						
32	.206	.572	98.201						
33	.191	.531	98.732						
34	.171	.474	99.206						
35	.152	.423	99.629						
36	.134	.371	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix

	Component										
	1	2	3	4	5	6	7	8	9	10	11
At1										.813	
At2										.780	
At3										.494	
SN1	.793										
SN2	.766										
SN3	.750										
SN4	.602										
SN5	.559										
PU1		.647									
PU2		.823									
PU3		.738									
PU4		.498		.461							
PU5		.562									
PEOU1				.823							
PEOU2				.816							
PEOU3				.803							
PDN1			.839								
PDN2			.841								
PDN3			.744								
FC1											.797
FC2											.740
PIN1									.780		
PIN2									.819		
PIN3									.780		
PIIT1								.805			
PIIT2								.842			
PIIT3								.880			
SIN1					.789						
SIN2					.825						
SIN3					.783						
C1							.888				
C2							.925				
C3							.850				
SDN1						.831					
SDN2						.856					
SDN3						.792					

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Factor loadings after eliminating PU4

Rotated Component Matrix

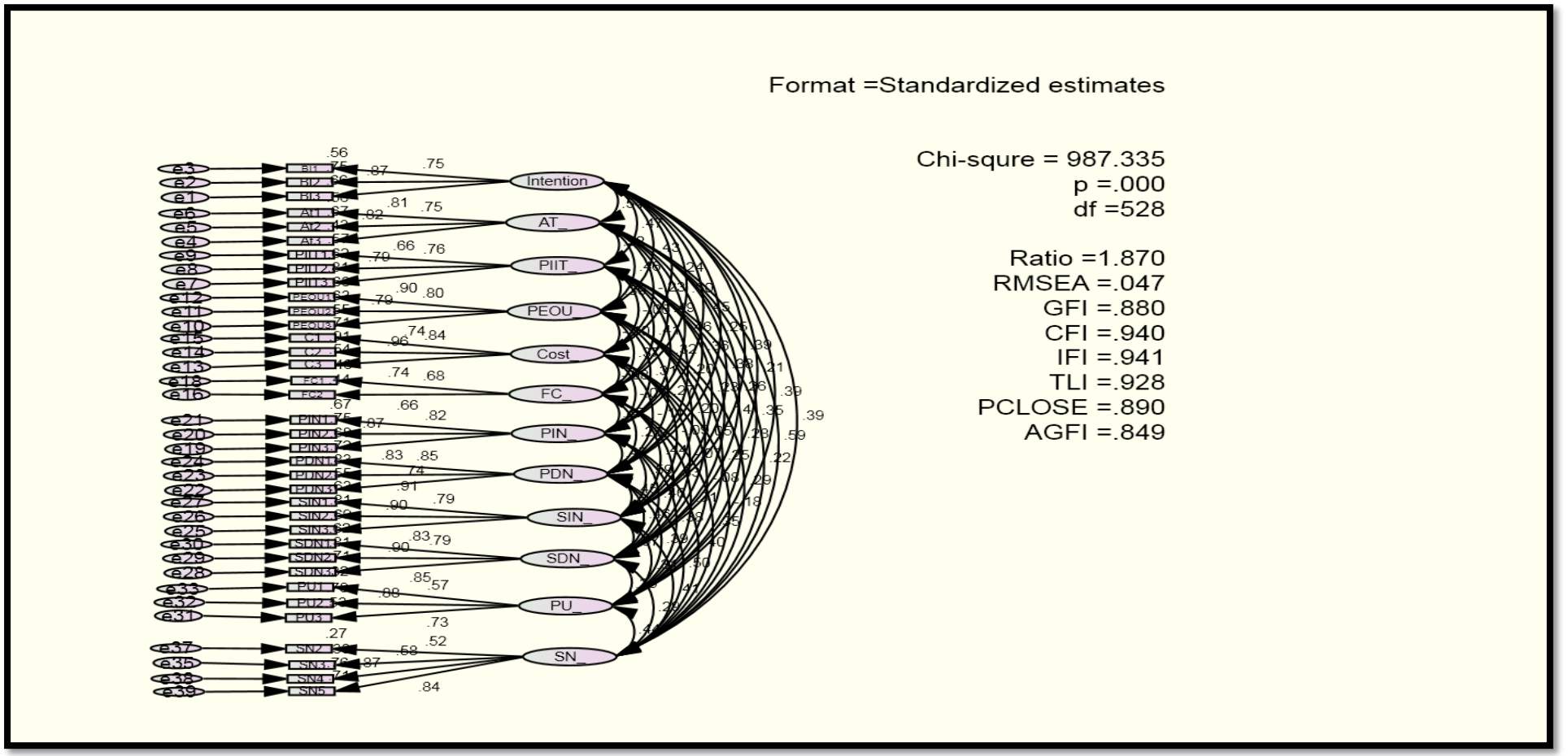
	Component										
	1	2	3	4	5	6	7	8	9	10	11
At1										.818	
At2										.785	
At3										.502	
SN1	.795										
SN2	.770										
SN3	.748										
SN4	.602										
SN5	.558										
PU1								.663			
PU2								.828			
PU3								.762			
PU5								.527			
PEOU1							.828				
PEOU2							.825				
PEOU3							.807				
PDN1		.840									
PDN2		.842									
PDN3		.745									
FC1											.800
FC2											.741
PIN1									.781		
PIN2									.818		
PIN3									.780		
PIIT1						.810					
PIIT2						.843					
PIIT3						.879					
SIN1			.789								
SIN2			.825								
SIN3			.782								
C1				.889							
C2				.925							
C3				.849							
SDN1					.830						
SDN2					.856						
SDN3					.791						

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Appendix K:

Confirmatory Factor Analysis (CFA)


Format =Standardized estimates
Chi-squre = 987.335
p =.000
df =528
Ratio =1.870
RMSEA =.047
GFI =.880
CFI =.940
IFI =.941
TLI =.928
PCLOSE =.890
AGFI =.849
Intention
AT_
PIIT_
PEOU_
Cost_
FC_
PIN_
PDN_
SIN_
SDN_
PU_
SN_

The model is recursive.
Sample size = 401

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
BI3	<---	Intention	1.000				
BI2	<---	Intention	1.032	.057	18.182	***	par_1
BI1	<---	Intention	.895	.057	15.812	***	par_2
At3	<---	AT_	1.000				
At2	<---	AT_	1.040	.083	12.530	***	par_3
At1	<---	AT_	1.067	.089	12.005	***	par_4
PIIT3	<---	PIIT_	1.000				
PIIT2	<---	PIIT_	.955	.055	17.277	***	par_5
PIIT1	<---	PIIT_	.872	.053	16.509	***	par_6
PEOU3	<---	PEOU_	1.000				
PEOU2	<---	PEOU_	1.089	.078	13.983	***	par_7
PEOU1	<---	PEOU_	1.216	.087	14.001	***	par_8
C3	<---	Cost_	1.000				
C2	<---	Cost_	1.331	.076	17.495	***	par_9
C1	<---	Cost_	1.168	.069	17.036	***	par_10
FC2	<---	FC_	1.000				

			Estimate	S.E.	C.R.	P	Label
FC1	<---	FC_	.919	.109	8.422	***	par_11
PIN3	<---	PIN_	1.000				
PIN2	<---	PIN_	1.026	.053	19.348	***	par_12
PIN1	<---	PIN_	.987	.054	18.190	***	par_13
PDN3	<---	PDN_	1.000				
PDN2	<---	PDN_	1.231	.071	17.384	***	par_14
PDN1	<---	PDN_	1.186	.071	16.761	***	par_15
SDN3	<---	SDN_	1.000				
SDN2	<---	SDN_	1.054	.050	21.106	***	par_16
SDN1	<---	SDN_	1.018	.056	18.197	***	par_17
PU3	<---	PU_	1.000				
PU2	<---	PU_	1.244	.096	12.902	***	par_18
PU1	<---	PU_	.820	.079	10.363	***	par_19
SN3	<---	SN_	1.000				
SN2	<---	SN_	.820	.095	8.637	***	par_20
SN4	<---	SN_	1.478	.124	11.903	***	par_21
SN5	<---	SN_	1.379	.117	11.787	***	par_22
SIN1	<---	SIN_	.913	.051	17.987	***	par_34
SIN2	<---	SIN_	1.029	.050	20.623	***	par_35
SIN3	<---	SIN_	1.000				

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
BI3	<---	Intention	.814
BI2	<---	Intention	.868
BI1	<---	Intention	.751
At3	<---	AT_	.656
At2	<---	AT_	.821
At1	<---	AT_	.751
PIIT3	<---	PIIT_	.897
PIIT2	<---	PIIT_	.788
PIIT1	<---	PIIT_	.755
PEOU3	<---	PEOU_	.743
PEOU2	<---	PEOU_	.793
PEOU1	<---	PEOU_	.796
C3	<---	Cost_	.735
C2	<---	Cost_	.955
C1	<---	Cost_	.843
FC2	<---	FC_	.660
FC1	<---	FC_	.675
PIN3	<---	PIN_	.827
PIN2	<---	PIN_	.866
PIN1	<---	PIN_	.816

			Estimate
PDN3	<---	PDN_	.740
PDN2	<---	PDN_	.910
PDN1	<---	PDN_	.851
SDN3	<---	SDN_	.845
SDN2	<---	SDN_	.903
SDN1	<---	SDN_	.788
PU3	<---	PU_	.729
PU2	<---	PU_	.880
PU1	<---	PU_	.568
SN3	<---	SN_	.578
SN2	<---	SN_	.524
SN4	<---	SN_	.870
SN5	<---	SN_	.843
SIN1	<---	SIN_	.793
SIN2	<---	SIN_	.898
SIN3	<---	SIN_	.833

Appendix L:

Convergent Validity Testing (Composite Reliability and Average Variance Extracted)

Attitude

	Std Loading	STD Loading squared	Error Variance = 1- loadings squared
Item1	0.751	0.564001	0.435999
Item 2	0.821	0.674041	0.325959
Item 3	0.656	0.430336	0.569664
Total Loadings	2.228	1.668378	1.331622
Total Loadings Squared	4.963984		
			6.295606
	AVE	0.556	
	Composite Reliability		0.788

Behavioral intention

	Std Loading	STD Loading squared	Error Variance = 1- loadings squared
Item1	0.751	0.564001	0.435999
Item 2	0.868	0.753424	0.246576
Item 3	0.814	0.662596	0.337404
Total Loadings	2.433	1.980021	1.019979
Total Loadings Squared	5.919489		
			6.939468
	AVE	0.660	
	Composite Reliability		0.853

Cost

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.843	0.710649	0.289351
Item 2	0.955	0.912025	0.087975
Item 3	0.735	0.540225	0.459775
Total Loadings	2.533	2.162899	0.837101
Total Loadings Squared	6.416089		
			7.25319
	AVE	0.721	
	Composite Reliability		0.885

Facilitating conditions

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.675	0.455625	0.544375
Item 2	0.66	0.4356	0.5644
Total Loadings	1.335	0.891225	1.108775
Total Loadings Squared	1.782225		
			2.891
	AVE	0.446	
	Composite Reliability		0.616

Personal descriptive norms

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.851	0.724201	0.275799
Item 2	0.91	0.8281	0.1719
Item 3	0.74	0.5476	0.4524
Total Loadings	2.501	2.099901	0.900099
Total Loadings Squared	6.255001		
			7.1551
	AVE	0.700	
	Composite Reliability		0.874

Perceived ease of use

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.796	0.633616	0.366384
Item 2	0.793	0.628849	0.371151
Item 3	0.743	0.552049	0.447951
Total Loadings	2.332	1.814514	1.185486
Total Loadings Squared	5.438224		
			6.62371
	AVE	0.605	
	Composite Reliability		0.821

Personal innovativeness in IT

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.755	0.570025	0.429975
Item 2	0.788	0.620944	0.379056
Item 3	0.897	0.804609	0.195391
Total Loadings	2.44	1.995578	1.004422
Total Loadings Squared	5.9536		
			6.958022
	AVE	**0.665**	
	Composite Reliability		**0.856**

Personal injunctive norm

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.816	0.665856	0.334144
Item 2	0.866	0.749956	0.250044
Item 3	0.827	0.683929	0.316071
Total Loadings	2.509	2.099741	0.900259
Total Loadings Squared	6.295081		
			7.19534
	AVE	**0.700**	
	Composite Reliability		**0.875**

Perceived usefulness

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.568	0.322624	0.677376
Item 2	0.88	0.7744	0.2256
Item 3	0.729	0.531441	0.468559
Total Loadings	2.177	1.628465	1.371535
Total Loadings Squared	4.739329		
			6.110864
	AVE	0.543	
	Composite Reliability		0.776

Societal descriptive norm

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.788	0.620944	0.379056
Item 2	0.903	0.815409	0.184591
Item 3	0.845	0.714025	0.285975
Total Loadings	2.536	2.150378	0.849622
Total Loadings Squared	6.431296		
			7.280918
	AVE	0.717	
	Composite Reliability		0.883

Societal injunctive norm

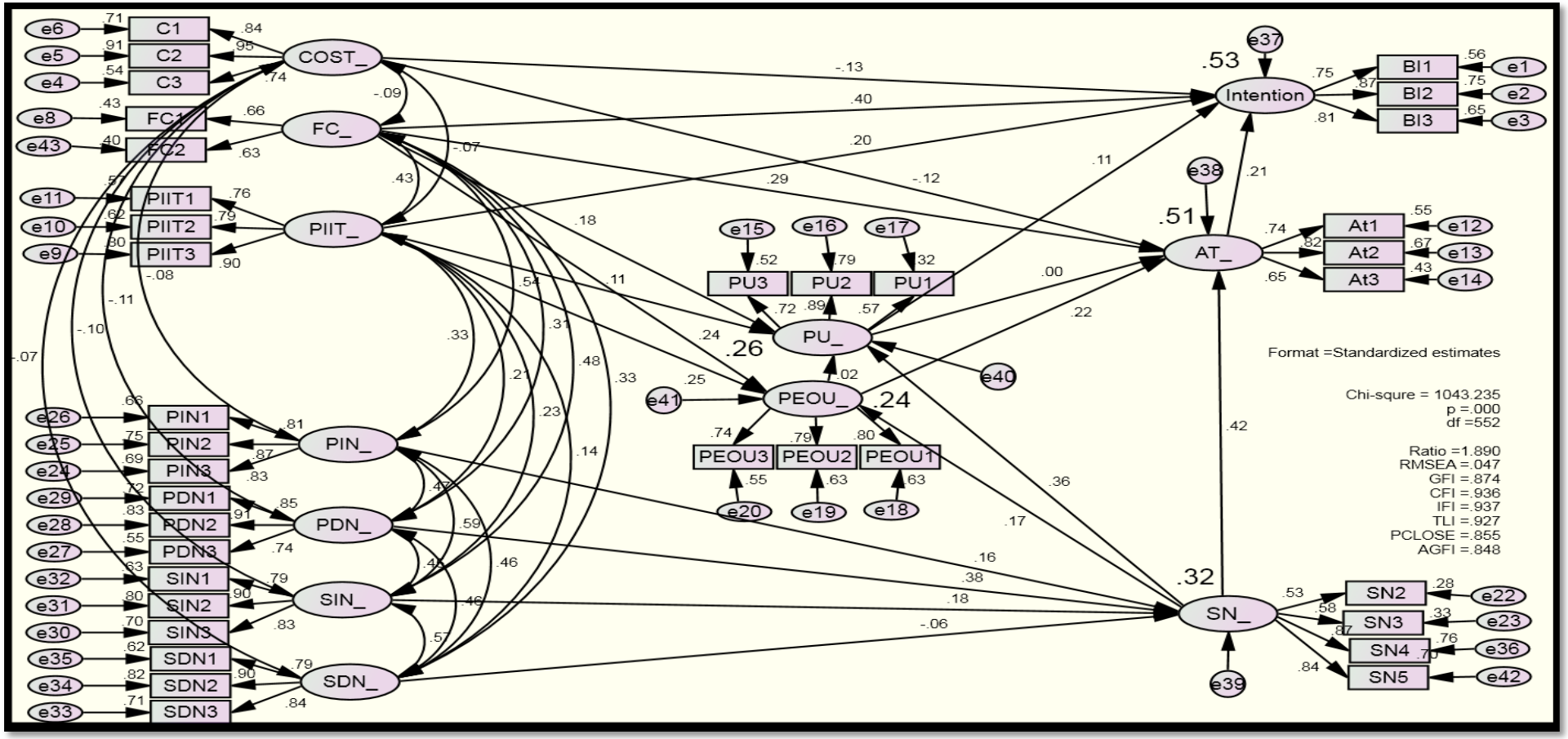
	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.793	0.628849	0.371151
Item 2	0.898	0.806404	0.193596
Item 3	0.833	0.693889	0.306111
Total Loadings	2.524	2.129142	0.870858
Total Loadings Squared	6.370576		
			7.241434
	AVE	0.710	
	Composite Reliability		0.880

Subjective norms

	Std Loading	STD Loading squared	Error Variance = 1-loadings squared
Item1	0.524	0.274576	0.725424
Item 2	0.578	0.334084	0.665916
Item 3	0.87	0.7569	0.2431
Item 4	0.843	0.710649	0.289351
Total Loadings	2.815	2.076209	1.923791
Total Loadings Squared	7.924225		
			9.848016
	AVE	0.519	
	Composite Reliability		0.805

Appendix M:

Hypothesized Model Analysis


C1
C2
C3
FC1
FC2
PIIT1
PIIT2
PIIT3
PIN1
PIN2
PIN3
PDN1
PDN2
PDN3
SIN1
SIN2
SIN3
SDN1
SDN2
SDN3
COST_
FC_
PIIT_
PIN_
PDN_
SIN_
SDN_
PU3
PU2
PU1
PU_
PEOU3
PEOU2
PEOU1
PEOU_
Intention
AT_
SN_
BI1
BI2
BI3
At1
At2
At3
SN2
SN3
SN4
SN5
.53
.51
.26
.24
.32
Format =Standardized estimates
Chi-squre = 1043.235
p =.000
df =552
Ratio =1.890
RMSEA =.047
GFI =.874
CFI =.936
IFI =.937
TLI =.927
PCLOSE =.855
AGFI =.848

Notes for Group (Group number 1)

The model is recursive.
Sample size = 401

Your model contains the following variables (Group number 1)

Observed, endogenous variables
BI1
BI2
BI3
C3
C2
C1
FC1
PIIT3
PIIT2
PIIT1
At1
At2
At3
PU3
PU2
PU1
PEOU1
PEOU2

PEOU3
SN2
SN3
PIN3
PIN2
PIN1
PDN3
PDN2
PDN1
SIN3
SIN2
SIN1
SDN3
SDN2
SDN1
SN4
SN5
FC2

Unobserved, endogenous variables

Intention
AT_
PU_
PEOU_
SN_

Unobserved, exogenous variables

e1
e2
e3
COST_
e4
e5
e6
FC_
e8
PIIT_
e9
e10
e11
e12
e13
e14
e15
e16
e17
e18
e19
e20
e22
e23
PIN_
PDN_
SIN_
SDN_

e33
e36
e26
e25
e24
e29
e28
e27
e32
e31
e30
e35
e34
e37
e38
e39
e40
e41
e42
e43

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
SN_	<---	PIN_	.106	.046	2.304	.021	par_22
SN_	<---	PDN_	.263	.049	5.379	***	par_23
SN_	<---	SIN_	.110	.044	2.470	.013	par_24
SN_	<---	SDN_	-.036	.040	-.883	.377	par_25
PEOU_	<---	SN_	.257	.092	2.792	.005	par_26
PEOU_	<---	PIIT_	.231	.059	3.899	***	par_30
PEOU_	<---	FC_	.308	.100	3.087	.002	par_32
PU_	<---	SN_	.537	.102	5.282	***	par_27
PU_	<---	PIIT_	.099	.056	1.752	.080	par_31
PU_	<---	FC_	.222	.098	2.256	.024	par_33
PU_	<---	PEOU_	.021	.063	.338	.735	par_63
AT_	<---	SN_	.645	.108	5.992	***	par_28
AT_	<---	COST_	-.118	.048	-2.465	.014	par_36
AT_	<---	PU_	.001	.062	.008	.993	par_39
AT_	<---	PEOU_	.221	.060	3.691	***	par_40
AT_	<---	FC_	.368	.093	3.958	***	par_62
Intention	<---	AT_	.189	.058	3.250	.001	par_29
Intention	<---	FC_	.453	.097	4.656	***	par_34
Intention	<---	PIIT_	.160	.046	3.481	***	par_35

			Estimate	S.E.	C.R.	P	Label
Intention	<---	COST_	-.118	.042	-2.817	.005	par_37
Intention	<---	PU_	.105	.050	2.103	.035	par_64
BI1	<---	Intention	1.000				
BI2	<---	Intention	1.153	.070	16.414	***	par_1
BI3	<---	Intention	1.111	.071	15.651	***	par_2
C3	<---	COST_	1.000				
C2	<---	COST_	1.324	.076	17.526	***	par_3
C1	<---	COST_	1.167	.068	17.095	***	par_4
FC1	<---	FC_	1.000				
PIIT3	<---	PIIT_	1.000				
PIIT2	<---	PIIT_	.956	.055	17.291	***	par_5
PIIT1	<---	PIIT_	.875	.053	16.535	***	par_6
At1	<---	AT_	1.000				
At2	<---	AT_	.975	.070	13.894	***	par_7
At3	<---	AT_	.939	.080	11.790	***	par_8
PU3	<---	PU_	1.000				
PU2	<---	PU_	1.264	.102	12.374	***	par_9
PU1	<---	PU_	.825	.080	10.267	***	par_10
PEOU1	<---	PEOU_	1.000				
PEOU2	<---	PEOU_	.893	.062	14.444	***	par_11
PEOU3	<---	PEOU_	.819	.059	13.860	***	par_12
SN2	<---	SN_	1.000				
SN3	<---	SN_	1.214	.140	8.651	***	par_13
PIN3	<---	PIN_	1.000				

			Estimate	S.E.	C.R.	P	Label
PIN2	<---	PIN_	1.027	.053	19.373	***	par_14
PIN1	<---	PIN_	.982	.054	18.112	***	par_15
PDN3	<---	PDN_	1.000				
PDN2	<---	PDN_	1.238	.071	17.367	***	par_16
PDN1	<---	PDN_	1.183	.071	16.693	***	par_17
SIN3	<---	SIN_	1.000				
SIN2	<---	SIN_	1.024	.050	20.626	***	par_18
SIN1	<---	SIN_	.911	.051	18.014	***	par_19
SDN3	<---	SDN_	1.000				
SDN2	<---	SDN_	1.058	.050	21.015	***	par_20
SDN1	<---	SDN_	1.016	.056	18.104	***	par_21
SN4	<---	SN_	1.797	.169	10.629	***	par_38
SN5	<---	SN_	1.667	.158	10.526	***	par_65
FC2	<---	FC_	1.071	.125	8.576	***	par_66

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
SN_	<---	PIN_	.159
SN_	<---	PDN_	.381
SN_	<---	SIN_	.183

			Estimate
SN_	<---	SDN_	-.058
PEOU_	<---	SN_	.167
PEOU_	<---	PIIT_	.255
PEOU_	<---	FC_	.242
PU_	<---	SN_	.364
PU_	<---	PIIT_	.114
PU_	<---	FC_	.182
PU_	<---	PEOU_	.022
AT_	<---	SN_	.422
AT_	<---	COST_	-.119
AT_	<---	PU_	.001
AT_	<---	PEOU_	.222
AT_	<---	FC_	.291
Intention	<---	AT_	.210
Intention	<---	FC_	.399
Intention	<---	PIIT_	.198
Intention	<---	COST_	-.132
Intention	<---	PU_	.113
BI1	<---	Intention	.751
BI2	<---	Intention	.868
BI3	<---	Intention	.809
C3	<---	COST_	.737
C2	<---	COST_	.953
C1	<---	COST_	.844

			Estimate
FC1	<---	FC_	.656
PIIT3	<---	PIIT_	.896
PIIT2	<---	PIIT_	.788
PIIT1	<---	PIIT_	.756
At1	<---	AT_	.745
At2	<---	AT_	.816
At3	<---	AT_	.652
PU3	<---	PU_	.722
PU2	<---	PU_	.886
PU1	<---	PU_	.565
PEOU1	<---	PEOU_	.797
PEOU2	<---	PEOU_	.792
PEOU3	<---	PEOU_	.741
SN2	<---	SN_	.526
SN3	<---	SN_	.578
PIN3	<---	PIN_	.828
PIN2	<---	PIN_	.868
PIN1	<---	PIN_	.813
PDN3	<---	PDN_	.739
PDN2	<---	PDN_	.913
PDN1	<---	PDN_	.848
SIN3	<---	SIN_	.835
SIN2	<---	SIN_	.896
SIN1	<---	SIN_	.793

			Estimate
SDN3	<---	SDN_	.844
SDN2	<---	SDN_	.905
SDN1	<---	SDN_	.786
SN4	<---	SN_	.870
SN5	<---	SN_	.839
FC2	<---	FC_	.630

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
SN_	.321
PEOU_	.240
PU_	.255
AT_	.512
Intention	.531
FC2	.397
SN5	.703
SN4	.757
SDN1	.618
SDN2	.819
SDN3	.713

	Estimate
SIN1	.628
SIN2	.802
SIN3	.697
PDN1	.719
PDN2	.834
PDN3	.546
PIN1	.661
PIN2	.753
PIN3	.686
SN3	.334
SN2	.276
PEOU3	.549
PEOU2	.627
PEOU1	.635
PU1	.320
PU2	.786
PU3	.521
At3	.425
At2	.665
At1	.555
PIIT1	.572
PIIT2	.622
PIIT3	.802
FC1	.430

	Estimate
C1	.713
C2	.907
C3	.543
BI3	.655
BI2	.753
BI1	.564

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	114	1043.235	552	.000	1.890
Saturated model	666	.000	0		
Independence model	36	8288.264	630	.000	13.156

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.111	.874	.848	.725

Model	RMR	GFI	AGFI	PGFI
Saturated model	.000	1.000		
Independence model	.499	.274	.233	.260

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.874	.856	.937	.927	.936
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.876	.766	.820
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	491.235	403.983	586.288

Model	NCP	LO 90	HI 90
Saturated model	.000	.000	.000
Independence model	7658.264	7367.749	7955.226

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	2.608	1.228	1.010	1.466
Saturated model	.000	.000	.000	.000
Independence model	20.721	19.146	18.419	19.888

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.047	.043	.052	.855
Independence model	.174	.171	.178	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	1271.235	1294.474	1726.546	1840.546
Saturated model	1332.000	1467.769	3991.978	4657.978
Independence model	8360.264	8367.603	8504.047	8540.047

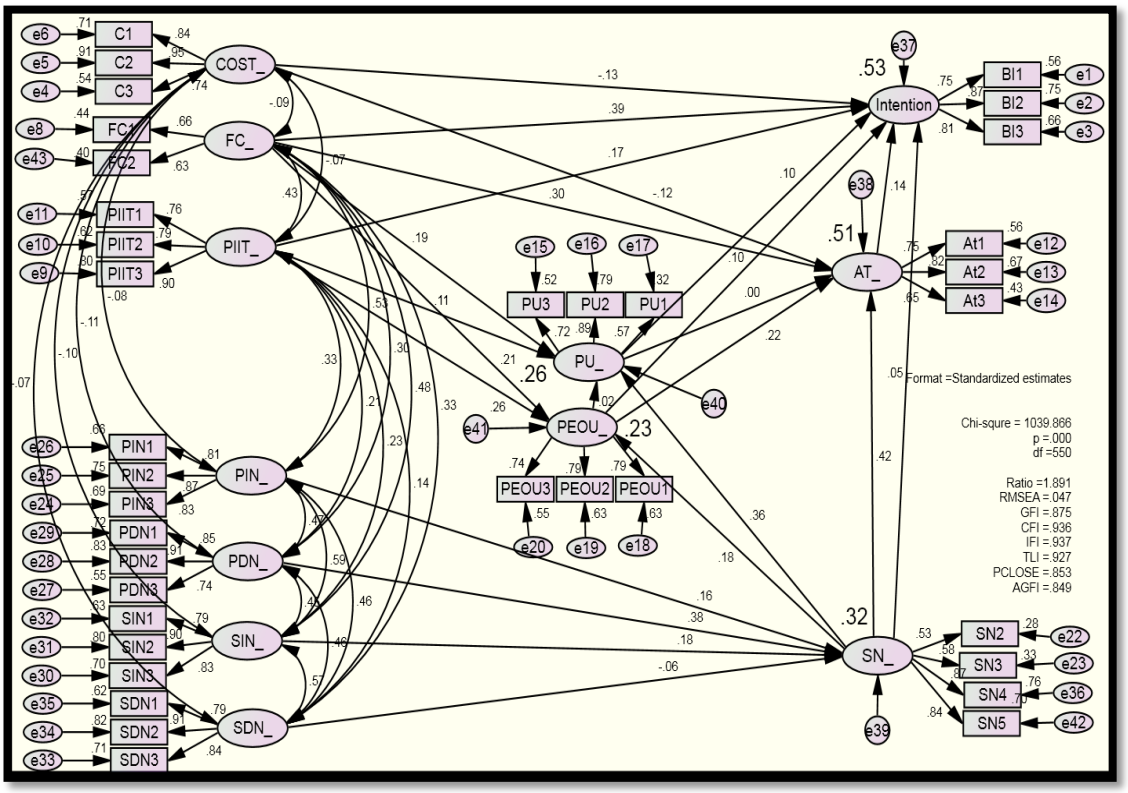
ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	3.178	2.960	3.416	3.236
Saturated model	3.330	3.330	3.330	3.669
Independence model	20.901	20.174	21.643	20.919

Appendix N:

Competing & Comparing Models Analysis

Competing Model



Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
SN_	<---	PIN_	.106	.046	2.305	.021	par_22
SN_	<---	PDN_	.262	.049	5.374	***	par_23
SN_	<---	SIN_	.110	.044	2.477	.013	par_24
SN_	<---	SDN_	-.036	.040	-.898	.369	par_25
PEOU_	<---	SN_	.272	.092	2.937	.003	par_26
PEOU_	<---	PIIT_	.237	.059	4.007	***	par_30
PEOU_	<---	FC_	.269	.100	2.683	.007	par_32
PU_	<---	SN_	.536	.102	5.266	***	par_27
PU_	<---	PIIT_	.097	.056	1.725	.085	par_31
PU_	<---	FC_	.225	.097	2.325	.020	par_33
PU_	<---	PEOU_	.023	.062	.367	.714	par_63
AT_	<---	SN_	.643	.108	5.957	***	par_28

			Estimate	S.E.	C.R.	P	Label
AT_	<---	COST_	-.118	.048	-2.456	.014	par_36
AT_	<---	PU_	-.001	.062	-.023	.982	par_39
AT_	<---	PEOU_	.220	.059	3.711	***	par_40
AT_	<---	FC_	.381	.093	4.116	***	par_62
Intention	<---	AT_	.126	.072	1.751	.080	par_29
Intention	<---	FC_	.438	.097	4.519	***	par_34
Intention	<---	PIIT_	.141	.047	3.023	.003	par_35
Intention	<---	COST_	-.120	.042	-2.874	.004	par_37
Intention	<---	PU_	.091	.053	1.707	.088	par_64
Intention	<---	SN_	.067	.089	.755	.450	par_67
Intention	<---	PEOU_	.091	.053	1.719	.086	par_68
BI1	<---	Intention	1.000				
BI2	<---	Intention	1.158	.071	16.348	***	par_1
BI3	<---	Intention	1.118	.072	15.614	***	par_2
C3	<---	COST_	1.000				
C2	<---	COST_	1.323	.075	17.534	***	par_3
C1	<---	COST_	1.167	.068	17.103	***	par_4
FC1	<---	FC_	1.000				
PIIT3	<---	PIIT_	1.000				
PIIT2	<---	PIIT_	.956	.055	17.283	***	par_5
PIIT1	<---	PIIT_	.873	.053	16.520	***	par_6
At1	<---	AT_	1.000				
At2	<---	AT_	.972	.070	13.898	***	par_7
At3	<---	AT_	.937	.079	11.809	***	par_8
PU3	<---	PU_	1.000				
PU2	<---	PU_	1.264	.102	12.362	***	par_9
PU1	<---	PU_	.825	.080	10.272	***	par_10
PEOU1	<---	PEOU_	1.000				
PEOU2	<---	PEOU_	.898	.062	14.471	***	par_11
PEOU3	<---	PEOU_	.821	.059	13.852	***	par_12
SN2	<---	SN_	1.000				
SN3	<---	SN_	1.215	.141	8.644	***	par_13
PIN3	<---	PIN_	1.000				
PIN2	<---	PIN_	1.027	.053	19.370	***	par_14
PIN1	<---	PIN_	.982	.054	18.110	***	par_15
PDN3	<---	PDN_	1.000				
PDN2	<---	PDN_	1.238	.071	17.368	***	par_16
PDN1	<---	PDN_	1.183	.071	16.694	***	par_17
SIN3	<---	SIN_	1.000				

			Estimate	S.E.	C.R.	P	Label
SIN2	<---	SIN_	1.024	.050	20.625	***	par_18
SIN1	<---	SIN_	.911	.051	18.016	***	par_19
SDN3	<---	SDN_	1.000				
SDN2	<---	SDN_	1.058	.050	21.014	***	par_20
SDN1	<---	SDN_	1.017	.056	18.105	***	par_21
SN4	<---	SN_	1.799	.169	10.620	***	par_38
SN5	<---	SN_	1.669	.159	10.516	***	par_65
FC2	<---	FC_	1.062	.124	8.548	***	par_66

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
SN_	<---	PIN_	.159
SN_	<---	PDN_	.381
SN_	<---	SIN_	.184
SN_	<---	SDN_	-.059
PEOU_	<---	SN_	.177
PEOU_	<---	PIIT_	.263
PEOU_	<---	FC_	.213
PU_	<---	SN_	.362
PU_	<---	PIIT_	.112
PU_	<---	FC_	.186
PU_	<---	PEOU_	.024
AT_	<---	SN_	.418
AT_	<---	COST_	-.119
AT_	<---	PU_	-.001
AT_	<---	PEOU_	.220
AT_	<---	FC_	.302
Intention	<---	AT_	.141
Intention	<---	FC_	.390
Intention	<---	PIIT_	.175
Intention	<---	COST_	-.135
Intention	<---	PU_	.098
Intention	<---	SN_	.049
Intention	<---	PEOU_	.102
BI1	<---	Intention	.748
BI2	<---	Intention	.868

			Estimate
BI3	<---	Intention	.811
C3	<---	COST_	.737
C2	<---	COST_	.952
C1	<---	COST_	.845
FC1	<---	FC_	.660
PIIT3	<---	PIIT_	.896
PIIT2	<---	PIIT_	.788
PIIT1	<---	PIIT_	.756
At1	<---	AT_	.747
At2	<---	AT_	.816
At3	<---	AT_	.652
PU3	<---	PU_	.722
PU2	<---	PU_	.887
PU1	<---	PU_	.566
PEOU1	<---	PEOU_	.794
PEOU2	<---	PEOU_	.794
PEOU3	<---	PEOU_	.740
SN2	<---	SN_	.525
SN3	<---	SN_	.578
PIN3	<---	PIN_	.828
PIN2	<---	PIN_	.868
PIN1	<---	PIN_	.813
PDN3	<---	PDN_	.739
PDN2	<---	PDN_	.913
PDN1	<---	PDN_	.848
SIN3	<---	SIN_	.835
SIN2	<---	SIN_	.896
SIN1	<---	SIN_	.793
SDN3	<---	SDN_	.844
SDN2	<---	SDN_	.905
SDN1	<---	SDN_	.786
SN4	<---	SN_	.870
SN5	<---	SN_	.839
FC2	<---	FC_	.629

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
SN_	.320
PEOU_	.229
PU_	.256
AT_	.512
Intention	.528
FC2	.396
SN5	.703
SN4	.757
SDN1	.618
SDN2	.819
SDN3	.712
SIN1	.628
SIN2	.802
SIN3	.697
PDN1	.719
PDN2	.834
PDN3	.546
PIN1	.662
PIN2	.753
PIN3	.686
SN3	.334
SN2	.276
PEOU3	.548
PEOU2	.631
PEOU1	.631
PU1	.320
PU2	.786
PU3	.521
At3	.425
At2	.666
At1	.558
PIIT1	.571
PIIT2	.622
PIIT3	.804
FC1	.436
C1	.714
C2	.907
C3	.544

	Estimate
BI3	.657
BI2	.754
BI1	.559

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	116	1039.866	550	.000	1.891
Saturated model	666	.000	0		
Independence model	36	8288.264	630	.000	13.156

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.111	.875	.849	.723
Saturated model	.000	1.000		
Independence model	.499	.274	.233	.260

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.875	.856	.937	.927	.936
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.873	.763	.817
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

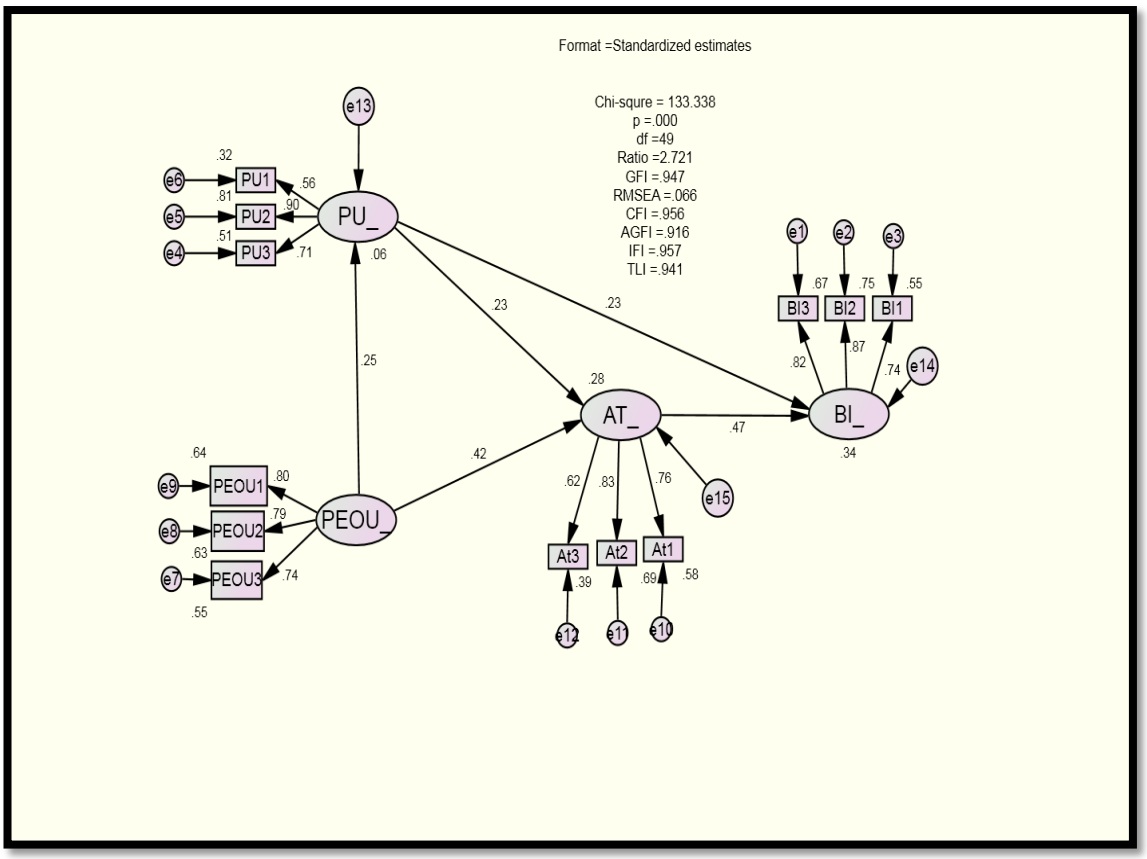
FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	2.600	1.225	1.007	1.462
Saturated model	.000	.000	.000	.000
Independence model	20.721	19.146	18.419	19.888

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.047	.043	.052	.853
Independence model	.174	.171	.178	.000

Comparing Model



Notes for Group (Group number 1)

The model is recursive.

Sample size = 401

Your model contains the following variables (Group number 1)

Observed, endogenous variables

BI3
BI2
BI1
PU3
PU2
PU1
PEOU3
PEOU2
PEOU1
At1
At2
At3
Unobserved, endogenous variables
BI_
PU_
AT_
Unobserved, exogenous variables
e1
e2
e3
e4
e5
e6
PEOU_
e7
e8
e9
e10
e11
e12
e13
e15
e14

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
PU_	<---	PEOU_	.286	.072	3.994	***	
AT_	<---	PU_	.249	.063	3.945	***	
AT_	<---	PEOU_	.528	.080	6.641	***	
BI_	<---	PU_	.241	.060	4.015	***	
BI_	<---	AT_	.463	.061	7.541	***	
BI3	<---	BI_	1.000				
BI2	<---	BI_	1.026	.059	17.532	***	
BI1	<---	BI_	.881	.057	15.525	***	
PU3	<---	PU_	1.000				
PU2	<---	PU_	1.301	.111	11.688	***	
PU1	<---	PU_	.829	.081	10.243	***	
PEOU3	<---	PEOU_	1.000				
PEOU2	<---	PEOU_	1.094	.080	13.756	***	
PEOU1	<---	PEOU_	1.225	.089	13.787	***	
At1	<---	AT_	1.000				
At2	<---	AT_	.973	.070	13.800	***	
At3	<---	AT_	.873	.077	11.375	***	

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
PU_	<---	PEOU_	.247
AT_	<---	PU_	.231
AT_	<---	PEOU_	.423
BI_	<---	PU_	.228
BI_	<---	AT_	.470
BI3	<---	BI_	.819
BI2	<---	BI_	.868
BI1	<---	BI_	.745
PU3	<---	PU_	.713
PU2	<---	PU_	.901
PU1	<---	PU_	.562
PEOU3	<---	PEOU_	.740
PEOU2	<---	PEOU_	.793
PEOU1	<---	PEOU_	.798
At1	<---	AT_	.762
At2	<---	AT_	.832
At3	<---	AT_	.621

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
PU_	.061

	Estimate
AT_	.281
BI_	.345
At3	.386
At2	.692
At1	.581
PEOU1	.638
PEOU2	.630
PEOU3	.548
PU1	.316
PU2	.812
PU3	.509
BI1	.554
BI2	.754
BI3	.671

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	29	133.338	49	.000	2.721
Saturated model	78	.000	0		
Independence model	12	2001.013	66	.000	30.318

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.127	.947	.916	.595
Saturated model	.000	1.000		
Independence model	.582	.433	.330	.367

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.933	.910	.957	.941	.956
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.066	.052	.079	.027
Independence model	.271	.261	.281	.000

Appendix O:

Some Letters from Universities Where the Study Conducted

AL-ISRA PRIVATE UNIVERSITY
AMMAN - JORDAN

جامعة الإسراء الخاصة
عمـان - الأردن

Ref. : ..... الـرقم : .....

Date : ..... التاريخ : ٢٠١٨/٥/٢٠

Subject: Ghassan M. Alnajjar

To Whom it may concern

With reference to the above subject, we are glad to inform you that **Mr. Ghassan M. Alnajjar** conducted his study **(Mobile commerce adoption in Jordan)** at our university on **October 2010.**

Regards,
VP
YOUSEF. ELJAAAFREH

Prof. Yousef Eljaafreh

جامعة الإسراء
AL-ISRA UNIV.
1991-١٩٩١
كلية الهندسة
Faculty of Engineering

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ص . ب ٣٣ و ٢٢ مكتب بريد جامعة الاسراء ١١٦٢٢
هاتف : ٤٧١١٧١٠ – ٤٧١١٨٣٠ – ٤٧١١٥٨١
فاكس : ٤٧١١٥٠٥

بسم الله الرحمن الرحيم

الجامعة الأردنية

THE UNIVERSITY OF JORDAN

مكتب الرئيس
President's Office

Ref: 13/1/11/2355
Date: May 5, 2011

Subject: Ghassan M. Al-Najjar

TO WHOM IT MAY CONCERN

This is to certify that **Mr. Ghassan Al-Najjar** conducted his study entitled "**Mobile Commerce Adoption in Jordan**" at The University of Jordan on October 2010.

Sincerely yours,

Professor Adel Tweissi
President

الجامعة الأردنية
THE UNIVERSITY OF JORDAN

هاتف – ٥٣٥٥٠٠٠ (٦-٩٦٢) فرعي- ٢١١١٠ فاكس – ٥٣٥٥٥١١(٦-٩٦٢) عمان ١١٩٤٢ الأردن
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