INVESTIGATING FACTORS AFFECTING ACCEPTANCE OF SMARTPHONE USAGE BY ADULTS

A THESIS SUBMITTED TO THE GRADUATE SCHOOL OF APPLIED SCIENCES OF NEAR EAST UNIVERSITY

By MOHAMMED ISMAEL SALIH

In Partial Fulfillment of the Requirements for the Degree of Master of Science in Computer Information Systems

NICOSIA, 2017

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I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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To my family...

ABSTRACT

The advancement of the smartphone technology has been rapid and widely accepted with no sign of decline but this technology is not widely accepted by the teeming adults particularly in northern Iraq. This has lured many researchers to study this situation, to know what is behind the reasons that some adults are not accepting this technology. Smartphone is a recent breakthrough in the field of mobile communication replacing its predecessor (cellular phone) with better performance, memory and highly more efficient Operating System. The study aims to investigate the factor that affects the adoption and usage of smartphone in northern Iraq amongst the adult population. A questionnaire was used in collecting data from 600 adults in four different cities in northern Iraq namely; Zakho, Dahouk, Sulaymaniyah and Erbil. Different data analysis was performed on the collected data such as Pearson Correlation, One way ANOVA, Independent sample t-test and descriptive analysis. The obtained result shows that female and male populations have no significant difference on the smartphone usage. Afterward, the results indicated that "perceived ease of use" was significantly different across all ages amongst the adult population. Additionally, there was no significant differences amongst all the educational status except towards "perceived ease of use" amongst the adult population. In addition, nine hypothesis were constructed throughout the study but the result showed that the relationship between attitude towards using and perceived usefulness, perceived ease of use and attitude toward using, facilitating conditions and perceived usefulness, selfsatisfaction and perceived ease of use, self-satisfaction and perceived usefulness, cost tolerance and perceived usefulness were supported while the relationship between perceived usefulness and perceived ease of using, facilitating conditions and perceived ease of use, cost tolerance and perceived ease of use were not supported. This study will be of immense benefit to smartphone manufactures, telecommunication operators, students and other researcher of smartphone interest.

Keywords: Smartphone usage acceptance by adults; smartphone usage; smartphone; Technology Acceptance Model; northern Iraq

ÖZET

Akıllı telefonların gelismeleri ve yaygın olarak kullanım için kabul edilmeleri çok hızlı olmasına rağmen özellikle Kuzey Irak'da yetişkinler arasında durum böyle değildir. Bu durum, birçok araştırmacının ilgisini çekmiş ve bunun sebebini araştırmak ve yetişkinlerin niçin bu teknolojiyi kabul etmediklerinin sebebini bulmak için çalışmalar yapılmıştır. Akıllı telefonlar daha önce kullanılan telefoların yerlerini almışlardır ve daha iyi performansları, daha çok bellekleri, ve daha verimli iletişim sistemleri bulunmaktadır. Bu çalışma, akıllı telefonların Kuzey Irak'da yetişkin kişiler arasında kullanımını etkileyen faktörleri araştırmaktadır. Çalışmada veriler anket yoluyla 600 yetişkinden Kuzey Irak'ın Zakho, Dahouk, Sulaymaniyah, ve Erbil şehirlerinden toplanmıştır. Toplanmış olan veriler üzerinde Pearson Korelasyonu, One Way Anova, bağımsız sample t-testi ve tanımsal analizler yapılmıştır. Elde edilen sonuçlara göre kadın ve erkek yetişkinler arasında akıllı telefon kullanımı üzerine herhangi bir fark görülmemiştir. Oysa, neticelere göre kullanım kolaylığının yetişinler arasında önemli miktarda farklılıklar gösterdiği ortaya çıkmıştır. Buna ilave olarak, akademik statüye göre, kullanım kolaylığı dışında herhangi bir önemli farklılık bulunmamıştır. Buna ilave olarak çalışma süresince dokuz hipotez yazılmıştır. Elde edilen sonuçlar kullanmaya yönelik algı ile algılanan kullanışlılık arasında, algılanan kullanım kolaylığı ile kullanıma karşı olan algı arasında, kolaylaştırma durumu ile algılanan kullanışlılık arasında, kendi kendini başarmak ile algılanan kullanım kolaylığı arasında, kendi kendine başarmak ile algılanan kullanışlık arasında, fiyat toleransı ile algılanan kullanım kolaylığı arasında ilişki olduğunu göstermiştir. Oysa, algılanan kullanışlık ile algılanan kullanım kolaylığı arasında, kolaylaştırma durumu ile algılanan kullanım kolaylığı arasında, fiyat toleransı ile algılanan kullanım kolaylığı arasında herhangi bir ilişkinin olmadığı tesbit edilmiştir. Bu çalışma, akıllı telefon üreten firmalara, telekomünikasyon operatörlerine, ve akıllı telefon konusunda araştırma yapan ve bu konuya ilgi duyan herkese yararlı olacağı düşünülmektedir.

Anahtar Kelimeler: Yetişkinlerin akıllı telefonu kullanmayı kabul etmeleri, akıllı telefon kullanımı, Teknoloji Kabul Modeli, Kuzey Irak

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LIST OF ABBREVIATIONS

GDP:	The Gross Domestic Product
OS:	Operating System
ICT:	Information Communication Technology
TAM:	Technology Acceptance Model
SI:	Social Impact
SMS:	Short Message Service
iOS:	iPhone Operating System
BAS:	Behavioral Activation System
PC:	Personal Computer
USA:	United States Of America
EOU:	Perceived Ease Of Use
TAM2:	Technology Acceptance Model 2
UTAUT:	Unified Theory Of Acceptance And Use Of Technology
PU:	Perceived Usefulness
IBM:	International Business Machine
PDA:	Personal Digital Assistant
GPS:	Navigating The Map Using
FC:	Facilitating Conditions
SS:	Self Satisfaction
CT:	Cost Tolerance
ANOVA:	Analysis Of Variance
SD:	Standard Deviation
AT:	Attitude Toward Using

CHAPTER 1 INTRODUCTION

This chapter explains statement of problem, the aim of the study, importance of study, study limitations, duration and overview of the study.

1.1 Technology and Acceptance

Presently, technology has changed the way most people live their daily lives both socially and economically thus making it a factor that determines progress in human lives (Jacob, 2016). However, it has literally added some huge advantages which had resulted in individuals saving energy, money and time. The advancement of technology has made some fantastic discoveries such that it has made it possible to put information right within our fingertips such as the introduction of smartphones.

A smartphone is an advancement of mobile phone which incorporates much functionality such as making phones calls, video calls, sending emails, accessing the internet with lots of processing power, its' capable of running many applications simultaneous (Joo & Sang, 2013). Since the introduction of smartphone in 1994 by IBM, the device has been widely accepted and adopted worldwide (Mark, 2016). The adoption of the smartphone has been increasing daily with no sign of declining. A recent statistics reported on smartphones users in 2014 by Statista forecasted that the adoption of smartphone will increase by 1 billion users in 2019 this implies a fast growth of smartphone adoption by users. However in Iraq, the adoption of smartphone rates is over 90% which constitutes 27 million total usage in 2012 (Ghayth, 2014). Thus, the adoption and usage of this technology is higher amongst the younger people which are 20-40 years than the older adults which are 60 and above years, this usage attitude across ages is strange in Iraq (Ghayth, 2014).

Iraq is considered a very wealthy country due to its heavy involvement in exportation of crude oil. Iraq is presently the second largest maker of unrefined petroleum and has the fifth-biggest demonstrated raw petroleum holds worldwide, as an aftereffect of Iraq expanded limit of offering oil the pay rates expanded too so that the normal pay increased

also the Gross Domestic Product (GDP) in Iraq extended to 10.20% in 2012 from the earlier year (Ghayth, 2014). This advancement in economy has given the Iraqi people the capacity to afford smartphones and also has made the smartphones market rapidly grow. This implies that even the older adults can afford the smartphone.

Smartphones makes more adults to stay in contact with others constantly and at various areas so they don't have to remain at home sitting tight for broadcasted information or correspondences with family and friends. It can urge them to a further dynamic social life because it's possible to conceivably be excluded from families geographically and still be able to contact their peers (Kurniawan, 2008). But as times goes on the population of various societies age, and because smartphone was a recent breakthrough in the field of Information Communication Technology (ICT), the teeming older adults tends to experience this technology for a relatively short period of time (Sayago et al., 2010). Thus, adults differ enormously from younger to older adult's users, with different perceptions regarding smartphone usage, challenges faced by each group while trying to accept the adoption of smart phone. The acceptance, benefitting of smartphone amongst the adult is divided across age and lagging behind the older adults (Niehaves & Plattfaut, 2013). However, the adoption and usage of smart phone rate decreases by age despite the tremendous advantages smart phone according to a report by Ma et al. (2016).

The increase in the acceptance of smart phones and as part of the daily lives of people has led to a challenge that everyone needs a smart phone for their daily activities. Thus, the elderly have a very low tendency of smart phone usage, they constitutes only 11% usage rate of the total population (Smith, 2011). To better understand technology usage attitude amongst adult, it is highly essential to comprehend the factors that impact acceptance and use of technology. However, the Technology Acceptance Model (TAM) offers an intense clarification of technology perception, utilization and is checked on here, together with experimental reviews worried with older people adopting technology. Generally, the study regarding smartphone technology acceptance has received very little attention in Iraq, up till now, is lacking, to such an extent that, there is an absence of study that investigates and affirms the determinants of conduct aim for smartphone acceptance from an organized viewpoint amongst the Iraq older. The present study seeks to investigate the various factors affecting smartphones acceptance by adults using scientific literatures, journals, websites and other relevant important data to investigate the factors that affects the adoption of smartphone amongst the teeming adults in the north of Iraq. This thesis will also employ the most adopted theoretical framework in this field prior to previous success usage, the Technology Acceptance Model (Davis et al., 1989) as a theoretical system in which the essential segments comprise of saw convenience and simplicity of use. Regardless of broad experimental backing for the model's legitimacy, TAM didn't completely clarify the whole parts of innovation selection. Late studies have reported that innovation selection could be spurred extraordinarily by variables other than customary TAM segments, for example, the appropriation's subjectively saw fiscal or noncash costs (Chen & Dubinsky, 2003; Kim et al., 2007) or social impact (SI) by others, for example, peers or relatives (Kwon & Chon, 2009; Campbell, 2007; Campbell & Russo, 2003). All the components are of specific enthusiasm to youthful understudies since they are touchier to money related when contrasted and more established age bunches.

1.2 The Problem

Recently, the usage of smartphone by the adults in northern Iraq is low so also its adoption, despite all the numerous benefit these smartphones comes with, the real reason for the declination is unknown due to lack of research in this field. But Ma et al. (2016) suggested some factors that hinder the acceptance of smartphone like cost, self satisfaction and user friendliness of these devices. And also old age comes with different health issues ranging from visual impairment, hearing disorder and so on, which might also be a problem that affects the adults from adopting these smartphones. Regarding the literature reviewed so far the older adults ignore the whole features that comes with smartphone and uses them for just calls making and texting. So this study will help in clearing the ambiguity that exists on factors that affect the usage of smartphone.

1.3 The Aim of the Study

This study aims to find out which factors affect the acceptance of smartphones by adults in northern Iraq.

1.3.1 Research Questions

- 1. What are the adult's attitudes towards accepting smartphone usage?
 - Is there any gender difference due to accepting smartphone usage amongst the adult population?
 - Is there any age difference due to accepting smartphone usage amongst the adult population?
 - Is there any educational difference due to accepting smartphone usage amongst the adult population?
- 2. What are the relationships between UTAUT and TAM model dimensions?
 - **H1:** There is a positive and significant relationship between attitude towards using and perceived usefulness.
 - **H2:** There is a positive and significant relationship between perceived usefulness and perceived ease of using.
 - **H3:** There is a positive and significant relationship between perceived ease of use and attitude toward using.
 - **H4:** There is a positive and significant relationship between facilitating conditions and perceived ease of use.
 - **H5:** There is a positive and significant relationship between facilitating conditions and perceived usefulness.
 - **H6:** There is a positive and significant relationship between self-satisfaction and perceived ease of use.
 - **H7:** There is a positive and significant relationship between self-satisfaction and perceived usefulness.
 - **H8:** There is a positive and significant relationship between cost tolerance and perceived ease of use.
 - **H9:** There is a positive and significant relationship between cost tolerance and perceived usefulness.

1.4 Importance of the Study

The world is fast becoming a global village through the recent achievements in information technology recorded in this time, information technology has brought so much ease in the way we handle our daily task. We now live in a modern world where everything is been

automated, ranging from banks, schools, hospitals. The things we couldn't access before, we can now access them with a blink of an eye (e-library, e-bank, e-schools...), and thus these technologies need hardware to run like a pc but the pc lacks something which is portability. The smartphone has this unique advantage (portability); you can carry it around and has lots of functionality with lots of processing power. However, Northern Iraqi adults find it very difficult to embrace this technology with all its functions due to some factors that affects mainly the adult population (Smith & Chaparro, 2015).

This research will help in pointing out these factors and suggesting possible ways out of the problem, a study of this nature has not been conducted in this region targeting mainly the adult population.

Additionally, the study will help the smartphone manufacturers in decision making, so as know what mainly affects the adult of northern Iraq from adopting and using their products. We also expect that these results can contribute to the design of smartphone applications for elderly users.

1.5 The Limitations of the Study

Although this research will achieve it aims but there are some limitation attached to it due to time and logistics.

- The data collection date was 20 August 2016 27 September 2016.
- This study targets only the adults in northern Iraq.
- Data selection will be collected from four various towns namely Zakho, Dahouk, Sulaymaniyah and Erbil of limited adults.

1.6 Overview of the Study

The whole thesis contains six chapters.

Chapter 1 is the introductory part of the thesis and explains the problem definition, importance of study, aim of the study.

Chapter 2 explains the related research work on smartphone usage, smartphone usage by adults, Technology Acceptance Model of smartphone (adults). And also, its gives an insight of the related area of the study.

Chapter 3 introduces the theoretical framework (TAM), advantages of smartphone.

Chapter 4 explains the methodology used in collecting data, data analysis and writing thesis.

Chapter 5 explains the results obtained in details and also discussed the result.

Chapter 6 concludes the study by making recommendations, suggestions for future studies.

CHAPTER 2 RELATED RESEARCH

This chapter presents the literature review on adult smartphone usage, and the Technology Acceptance Model of smartphone (Adults).

2.1 Smartphone Usage by Adults

McIlroy (2015) reported that around 2 billion individuals use smartphones over the globe, with over a large portion of the populace in created nations depending on them day by day. This high popularity by smartphone implies that there is the potential for objective smartphone information to be utilized to address research questions in this present reality (MacKerron & Mourato, 2013).

A recent study conducted by British psychologists Sally et al. (2015) reported that younger adult's use their smartphones roughly twice as much as they estimate that they do. Actually, the little preparatory study found that these young adults utilized their smartphones a normal of five hours a day that is about 33% of their aggregate waking hours.

And according to a recent report made by Ingrid (2015) regarding smartphone usage by the adults population worldwide, the report stated that 80% of online adults use the smartphone and the figures will likely increase in the near future. Smartphone utilization amongst the older population group has resulted in making life very easy, more efficient in communicating with one another as the major reason behind the use of this wonderful technology called smartphone. The general adult population adopts and uses different type of smartphone from different manufacturers ranging from Samsung, Apple, Nokia, and these smartphones have replaced some of the functions of pc, the smartphone gives lots of features in making the things very easy for the adults. Apart from communication with different people like family, friends, business partners, daily routines, consulting the health care providers/services, smartphone comes with lots of functionalities that can be applied in various innovative fields in adult people's daily life, such as e-hospital, e-services, telemedicine, robots, health care delivery, intelligent monitoring (Czaja et al., 2009).

Marschollek et al. (2009) reported that more smartphones applications will be brought into more established adult's home surroundings and it is a positive pattern for more established adults to utilize smartphone in home. Also, smartphone can possibly help with observing and keeping up wellbeing and additionally overseeing wellbeing conditions and sicknesses, particularly in encouraging financially savvy care.

2.2 TAM and Mobile Devices Usage of Adults

Wang and Yao (2009) conducted a study using the TAM model, they both documented that the use of technology has appeared to be very useful to older individuals, however an advanced separation remains. They suggested that most elderly individuals' attitude towards technology utilization was good, although smartphone technologies rates of usage a little bit low. A report that in 2009, just 1.7% of Chinese Internet clients were beyond 60 20.7% year old, contrasted and 20.7% adults aged between 30 to 39 years, and 13.9% adults aged between 40 to 59-year old group.

Joo and Sang (2013) conducted a research that was focused on investigating the factors that impact usage and adoption of smartphones amongst Koreans adults using two different approaches: Uses and Gratification (U&G) and Technological Acceptance Model (TAM). Keeping that in mind, the study utilized information from oneself-reported overview of 491 Koreans grown-up who utilize Apple's iPhone. A basic condition display utilized in the present review shows that Koreans' smartphone usage is influenced more by inspirations in light of instrumental and objective arranged use than by ritualized and less objective usage. They discovered that to spread information with innovative and dynamic components, designers ought to focus on clients' inborn inspirations and additionally to their extraneous recognitions.

Sheikh et al. (2016) conducted a research on the usage of smartphone by older people in Pakistan. They reported that the extending advancement and use of technology presents challenges for adults in utilizing this new technology. Less ergonomically composed Smartphones are starting now to change for usability needs of more adults, they feel uneasiness. In this examination a comprehensively utilized Technology Acceptance Model (TAM) was connected to explore the fundamental Human factors that might be of huge impact on smartphone adoption and attitude goal amongst the adults in Pakistan.

Calisir et al. (2013) reported that the late improvements in technology has made conceivable to have the capacity to interface with the Internet from anyplace, at whatever time through advanced mobile phones. They identified the factors that influence social network usage of smartphones amongst students. They adopted an expanded variant of TAM approach by given out questionnaires amongst the randomly selected students from Turkey keeping in mind the end goal to inspect the proposed display. The analysis showed that 155 participants perceived ease of use, perceived enjoyment, attitude intention to use, social influence, perceived usefulness and has either direct or indirect effects on usage of the social networks on Smartphones amongst students participants.

Ma et al. (2016) conducted a study on older adults in China. They investigated and explored the key major factors of smartphone acceptance. They used 120 Chinese adults which were over 55 years which were selected at random and were administered an interview and a questionnaire. TAM and UTAUT models were adopted for the approach. They found that the younger participants with more stable economic condition related to salary, better sound education, and married with support of the family were more likely to adopt smartphone.

Hui (2016) conducted a research regarding the key factors that motivates older adults aged above 50 years about the smartphone adoption in Malaysia based on TAM and Innovation Diffusion Theory (IDT) as an approach. They made use of 300 participants from Selangor and Kuala Lumpur in Malaysia at random. They highlighted a fresh understanding of smartphone adoption among older adults by proposing a model which explained that 54.5% of the variance have intended using smartphone, which is more than the 40 percent variance found in most of TAM studies.

2.3 Factors Affecting Smartphone Usage by Adults

Regarding the factors hindering the acceptance of Smartphone by adults, it was suggested that the main factors are financial constraint, lack of awareness in using new technology and different variation of physical challenges according to (Mohadis & Ali, 2014; Ma et al., 2016; Kim, 2008; Osman et al., 2012) however, based on the study by Hwangbo et al. (2013) argued that the main factor is the Smartphone touch screen, furthermore Ma et al. (2016) reported that financial constraint is not a factor as far as the Smartphone worth's the cost.

It's documented that adults mostly use the basic features of the Smartphone like making calls, composing short message service (SMS) ignoring most of the other important features that smartphones comes with stated by Zhou et al. (2014) and Osman et al. (2012) while some adults can't even read SMS or reply SMS due to some physical challenges as claimed by Mohadis and Ali (2014) also Verkasalo (2010) suggested that most smartphone users use it mainly for entertainment purposes. Ma et al. (2016) suggest that almost half of the population of adults use smartphones but the younger adult tends to use smartphones than the older adults.

In the opinion of Smith and Chaparro (2015), they reported that both the older and younger adults prefers using voice inputs than using the onscreen keyboards but the older adults demonstrated slower typing than the younger adults. Subsequently, they argued that older adults tends to commits more errors than their counter part younger adults when typing both onscreen or keyboard.

Joo and Sang (2013) suggest that the major factor affecting the acceptance of smartphone is the inability with regards to spreading information framework with creative and dynamic elements; furthermore engineers ought to focus on clients' inborn inspirations and additionally to their outward recognitions.

Huang and Chen (2013) gender don't have conspicuous impact in passive or active adoption of smartphones furthermore frameworks of smartphone have clear distinction in passive or active adoption of smartphones, and iOS clients are effectively adopted, and Android framework clients are inactively adopted.

While Mohadis and Ali (2014) carried out a study on smartphone acceptance and reported that adult population experience issues in utilizing smartphones because of various factors, for example, money related constraints, vision impairments, and absence of premium and information in utilizing technological gadgets and their propelled functionalities.

Verkasalo et al. (2010) analyzed smartphone users together with non-smartphone, reporting that the perceived technological boundaries had adversely influence attitude control, mirroring individuals' appraisal of themselves being fit for utilizing the services without inconvenience. The Attitude control is specifically connected to perceived (with the exception of games) and perceived happiness, as hypothesized. Perceived hapiness and

convenience were nonexclusively found to disclose the aim to utilize smartphone applications for both smartphone users and non-smartphone users.

Ma et al. (2015) suggested that the factors that affects the use and adoption of smartphone is primarily attitude intention, smugness, encouraging conditions, and usability were additionally essential components. What's more, they found that the younger adults with advanced education, better financial condition and non-widowed where more prone to utilize smartphone.

However, Pan et al. (2013) reported that social influence, entertainment utility and compatibility of smartphone impact people perceived usefulness and attitude to use. That is exceptionally profitable ramifications for makers to enhance smartphone's intuitive interface to win greater piece of the pie.

Park et al. (2013) investigated the factors influencing smartphone usage and adoption the results incorporated people's mental predecessors, for example, inspirations for social consideration and instrumental utilization of smartphones, inventiveness, Behavioral Activation System (BAS), and locus of control. While the inspirations and creativity checked past reviews' discoveries, BAS and locus of control exhibited their extraordinary commitments to clarifying advanced smartphone utilization. Smartphone reliance was likewise influenced by the predecessors in the utilization of smartphones.

Goedhart et al. (2015) validated a newly designed smartphone application usage amongst adult in the Netherlands, but he found that most adults use smartphone for making calls and text messaging.

Chen et al. (2009) reported that self-efficacy was a big factor for adults accepting smartphone usage, and attitude intention. Attitude towards adoption of smartphone was also influenced by these factors like testability, organizational and environmental factors.

Smith and Chaparro (2015) investigated smartphone content information technique execution, ease of use, and inclination with adults of young and old ages in Kansas (USA), they both documented that both age groups type at relatively the same speed fast with the help of voice input, however, the older population was slightly slower compared to the younger adults using all other methods. Both groups had low mistake rates when utilizing physical qwerty keyboards and voice, yet more older adults submitted more blunders with the other three strategies. Both more youthful and older adults favored voice and physical

qwerty keyboards to the rest of the strategies. Handwriting reliably played out the most noticeably awful and was appraised least by both groups.

Zhou et al. (2014) conducted a research on factors that influences the use of new functions in smartphones by adults in China, the study aimed towards extending the utilization of smartphones to new functionalities by adults and also understanding older adult requirements in the usage of smartphones they both documented that adopting new features is different from adopting the product itself. Readability and discovering a certain feature, that are critical for older adults' adoption of phones feature, does not determines the acceptance of new features in smartphones.

Additionally Koivumäki et al. (2006) conducted a study on young adult acceptance of mobile services based on TAM as theoretical framework, they documented that functionalities, user guidance and support, and user skills are key concerns in understanding the adoption of mobile services. And the researchers also noted that usefulness and user-satisfaction are significant indicators of the readiness to prescribe the services to adult customers.

CHAPTER 3 THEORITICAL FRAMEWORK

This chapter presents the theoretical framework to be used for this study, thereby explaining TAM and UTAUT as the selected framework and also briefs the meaning of smartphone and it advantages.

3.1 Technology Acceptance Model (TAM)

The word TAM is an acronym which stands for Technology Acceptance Model that was first proposed by Davis (1989) during his Doctoral dissertation, TAM is one of the most widely used model in the field of research to examine the individual acceptance attitude on ICT, why precisely do people use technology in the work context, however TAM is categorized into two distinct part in explaining why do people use technology as perceived ease of use and usefulness.

Furthermore, in TAM model, the two major elements perceived ease of use and perceived usefulness are both critical in PC use practices. Davis characterizes perceived usefulness as the imminent client's subjective likelihood that utilizing a particular application framework will improve his or her employment or life performance. Perceived ease of use (PEOU) can be characterized as the extent to which the planned client expects the target framework to be effort free.



Figure 3.1: Technology Acceptance Model (TAM)

TAM seemed substantial with regards to the internet, electronic-commerce, mobile gadgets, and telemedicine TAM has been connected in various nations: USA, Europe, Korea, China, Japan, Russia and South Africa. Attitudes towards acceptance and attitudes of teachers, employees, students and community groups, have been thoroughly researched.

Different researchers and analysts additionally have broadened TAM by joining different hypotheses like motivation theory, innovation diffusion theory, and flow theory; or by joining different develops like social standards, trust, risk perceived, cost, work pertinence, playfulness, willfulness of utilization, self-adequacy and compatibility.

Additionally, Venkatesh and Davis (2000) both created an updated version of TAM as TAM2 that incorporates social impact forms image and psychological instrumental procedures (work importance, yield quality, and result verifiability) as increments to the first TAM. Venkatesh et al. (2003) inspected eight user acceptance models and detailed a Unified Theory of Acceptance and Use of Technology (UTAUT), which clarified 70% of fluctuation in utilization expectation. UTAUT distinguishes three direct determinants of aim of use (performance expectancy, effort expectancy, and social influence), two direct determinants of attitude usage (facilitating conditions and attitude intention), and fuses four arbitrators (age, gender, experience, intentionality of utilization).

3.1.1 TAM limitations

This theory TAM comes with its own limitations, two restrictions are noted as to the experimental reviews on TAM regarding ageing in the most recent decade. Firstly, all reviews planned to examine variables that impact the old individual's adopting technology, however just a couple considered age-related factors. The component of "age" in the greater part of studies was measured by 'ordered age' which is the quantity of years or months that have gone since the individual's introduction to the world. Maturing happens on many levels and can be sorted on five measurements: ordered, organic, practical, mental, and social (Erber, 2010; Quadagno, 2008) Chronological age can't separate individuals who are diverse in physical capacities, or mental execution (Stuart, 2010). To better anticipate adoption of technology and adults usage attitude, more age related qualities or restrictions should be considered.

Besides, among the experimental reviews recognized, eleven of them utilized survey based quantitative research strategies, and the greater part depended on cross-sectional

information. Cross-sectional reviews are less certain about causal derivation. Experience and learning sway on the acknowledgment of innovation (Venkatesh, 2003).

Social impact forms on perceived usefulness (PU) and behavioral intention to utilize (BI) debilitate with expanding background, yet the impacts of intellectual instrumental procedures stay critical after some time. Longitudinal reviews are required since user attitudes, intentions and necessities have changed when they turn out to be more acquainted with technology (Hu & Ma, 2003).

Conclusively, this theory doesn't tell us how to design a technology so that it gets accepted, or how to make the technology easy to use. In other word the TAM model doesn't give us any design advice on how we should make a better technology rather it just tell to make sure the it's easy to use and accepted.

3.2 Unified Theory of Acceptance Use of Technology (UTAUT)

The term UTUAT is an acronym which stands for Unified Theory of Acceptance Use of Technology which was developed from TAM. The theory attempts to describe the level of adoption and acceptance of information Technology usage amongst users. Furthermore, these theories try to evaluate if the user have the capacity to accept new technology and also measure his ability to manage the new systems. The TAM model assists information technology decision makers and managers to evaluate the success of newly introduced technology in an institution and also influence the acceptance of this technology to users.

Numerous research institutions have utilized UTUAT to find out the degree of acceptance of technology by users they tried to answer the client attitudes towards accepting information technology solutions. Notwithstanding the level of accessible foundations and bolster organizations, there is a worry regarding whether educators are set up to incorporate accessible technology into viable lessons for their students. (Koivumäki et al., 2008; Eckhardt et al., 2009; Curtis et al., 2010; Verhoeven et al., 2010).

The following Figure 3.2 was developed by Venkatesh et al. (2003), it comprises of four primary concepts which are, Facilitating Conditions (FC), Social Influence (SI), Effort Expectancy (EE) and Performance Expectancy (PE).

These four principle ideas are autonomous factors which impact subordinate factors, usage and attitude. Age, gender, experience and volunteers of framework utilize have in a roundabout way affected the needy factors by means of the four primary ideas. Behavioral intention is viewed as a basic indicator of technology utilization (Venkatesh et al., 2003).



Figure 3.2: Unified Theory of Acceptance Use of Technology (UTAUT)

- **Performance expectancy:** This construct determines the level at which a user believes that utilizing the framework will aid an individual to achieve gains in work performances.
- Effort expectancy: This construct determines the level at the system ease of usage.
- **Social influence:** This construct determines the level at which a user believes or perceive the importance of the system to him.
- **Facilitating conditions:** The level to which people trusts that utilizing the framework will help them to achieve gains in employment performances.

3.3 Smartphone

The first Smartphone was developed by the International Business Machine (IBM) in the year 1994 called the IBM Simon and later Nokia developed its first model of smartphone called the Nokia Communicator 9000 in the year 1996. Both devices were created with mainly the features of the mobile phone and the personal digital assistant (PDA), both devices were bigger, better than its predecessor (mobile phone), and were used in managing user contacts and calendar.



Figure 3.3: Earlier version of smartphone

Thereafter, in the year 2000 a better smartphone with more processing power and features was released by Ericsson called the Ericsson R380. Later on other companies like Apple, Palm, and Blackberry released some series of smartphones, the iPhone eschewed the hardware buttons in the smartphone, making the smartphone a full touch screen device which is presently used up to date as a template for most smartphones.

Before the invention of smartphones, phones were mostly used for making just call, with the smartphones you can execute tones of features ranging from internet browsing, social medias, live update news, playing music, videos, watch live television broadcast and lots more. Smartphones offer lots more than its predecessor (cell phone), they are like small computers that can be fit in your pockets. Nowadays smartphones comes with touch screen that replaced the normal button used for controlling the smartphone by gestures and taps, and they also come with a very large memory and a higher processing power that can run lots of programs simultaneously. Smartphones carries some of the below functionalities:

- Making voice calls.
- Making video calls.
- Accessing of the internet and also browsing the web.
- Playing built-in games or downloaded games.
- Playing music, sharing media files.
- Taking photos, videos and audio files.
- Navigating the map using GPS.

Presently, smartphones come in different models but we will look at the major manufacturers such as: Samsung, Apple, HTC, Nokia, LG, Motorola, RIM, Palms and so on.

However, these different models of smartphones all work using different smartphone operating system, OS is the underlying program that runs everything in the smartphone just like your personal computer. The main major smartphone operating systems are three:

• **Google Android** is the most widely used operating system in smartphones today, and there are lots of manufacturers and models that make use of this operating system, the google android looks like the iPhone (iOS), you click an icon to startup a feature in the android.

The android OS is open source, this means you have full control over the OS by editing the core features that it come with it to your own taste, however most customization is done by the hardware manufacturers like Samsung, HTC, etc.

The makers of the phones refers to this an interface, most makers have different features in their devices which made android devices similar to one another but not the same. Dissimilar models comes with different predefined functions and features.

- **Apple iOS** is created by the Apple company, they run majorly on all apple devices of different models, ranging from iPod, iPad, and iPhone, the iOS is very simple to use you launch a feature by clicking on an icon comes on the Apple.
- Windows Phone are designed by Microsoft and it's similar to the new Windows 8 interface. Touching one of the onscreen obstructs diverse applications and the phone functions.

The three recorded here might be the real phone working frameworks, however they're a long way from the main ones. You may likewise experience: Palm, BlackBerry, Maemo, Symbian and Bada.

They all work a little uniquely in contrast to the Android, iOS and Windows Phone frameworks you may go over.

3.3.1 Smartphone advantages

Smartphones today have become an essential part of our daily lives because of the positive impacts they have on people, according to a report by Caglar (2016). This device comes with numerous functionalities ranging from making calls, text messaging, social networks accessibility, e-banking, e-hospital, listen to e-lectures, google mapping, recording media files such as videos, audio files, making photos.

Due to its numerous advantages and functionalities, the state of the art device according to Christina (2016) predicts it will replace the traditional personal computer (PC) in two years time.

3.4 Smartphone Usage in World

The quantity of smartphone usage worldwide is predicted to develop from 1.5 billion in 2014 to almost 2.5 billion in 2019, with the smartphone entrance rating expanding also. A little more than 36 percent of the total populace is anticipated to utilize smartphone by 2018, up from around 10 percent in 2011 (Mark, 2016).

The nation of China, the most crowded nation on the planet, drives the smartphone companies. The quantity of China potential smartphone utilization is predicted to develop from almost 480 million in 2013 to just about 690 million by 2019. About half of Chinese populace is anticipated to utilize a smartphone by 2018. This implies by 2018, a fourth of most smartphone users on the planet will situate in China. Additionally, United States is additionally a vital market for smartphone market, with about 170 million smartphone clients in 2014. By 2019, the quantity of smartphone users in the U.S. is relied upon to increment to 236 million.

Android by Google's and iOS by Apple are the most prevalent smartphone working frameworks in the business. Initially seventy five percent of 2015 alone, about a billion smartphone with Android or iOS working frameworks were sold out to customers around the world. About 80 percent of the deals was done by Android smartphone, drives the industry. Interestingly, around 15 percent of all smartphone sold to end clients have iOS as their working framework. The main smartphone merchants are Samsung and Apple, with around 25 percent and 15 percent of the share individually, trailed by Huawei, Lenovo and Xiaomi. Below is a statistics of the smartphone usage worldwide (Mark, 2016).



Figure 3.4: Number of smartphone users worldwide from 2014 to 2020 (in billions)

3.4.1 Smartphone usage in Iraq

Before the invasion of Iraq in 2003 by the U.S there was nothing like mobile phone in Iraq due to some laws that prohibits the usage and adoption of smartphone across Iraq. After the war and the fall of the Iraqi regime the ban of cell phone usage was lifted and the smartphone market became open in Iraq. Iraq as an oil exporter nation considered one of the wealthiest nations. Iraq is currently the second largest maker of unrefined petroleum and has the fifth-biggest demonstrated raw petroleum holds on the planet, as a after effect of Iraq expanded limit of offering oil the compensations expanded too so that the normal wage ascend. The Gross Domestic Product (GDP) in Iraq extended 10.20 percent in 2012 from the earlier 6 years (Ghayth, 2014). This advancement in the Iraqi economy reflexes the expansion of the acquiring power for Iraqi customers, this revived the Iraqi business sector and particularly gadgets market individuals purchasing excessively these things which were averted to enter to the business sector before 2003 administration (Looney, 2005).

With the world advancement in the field of technology and increasingly becoming more and more interconnected, the adoption of these technology (smartphone) becomes very influential factor in the human progress, smartphone is a recent breakthrough in the field of mobile communication replacing its predecessor (cellular phone) with better performance, memory and highly more efficient Operating System (OS), the smartphone is more than just a cell phone because of its features are far beyond just making calls, text messages, the smartphone gives you an instant access to explore the internet (Web browsing, emails, latest news, blogging) with lots of state of the art applications ranging from social apps, job apps, and office apps, the feel and touch of these devices, user friendly, portability makes it highly attractive in this age across different societies, according to a recent report in the second quarter of 2015 by International Data Corporation, Worldwide Quarterly Mobile Phone Tracker, there was an avalanche in the market growth of smartphone worldwide, with a growth of 13.0 % and sales of over 341.5 million smartphones.

The increase in the usage of smartphones in our society and as part of our daily lives has lead to a challenge that everyone needs a smartphone for their daily activities. But as times goes on the population of various societies age, and because smartphone was a recent breakthrough in the field of ICT, the teeming older adults tends to experience this technology for a relatively short period of time (Sayago et al., 2010).

Thus, adults differ enormously from younger to older adult's users, with different perceptions, challenges faced by each group while trying to accept the adoption of smartphone. The acceptance, benefitting of smartphone amongst the adult is divided across age and lagging behind the older adults (Niehaves & Plattfaut, 2013).

However, the adoption and usage of smartphone rate decreases by age despite the tremendous advantages smartphone comes with, thus the younger adults have higher tendency of adopting a smartphone according to a report by Ma et al. (2016), the elderly have a very low tendency of smartphone usage, they constitutes only 11% usage rate of the total population (Smith, 2011).

CHAPTER 4 METHODOLOGY

This chapter tends to explain in details the research methodology of the whole study, by which the research model, the instrumentation used in the research, the participants involved, techniques adopted in data analysis, and lastly the data collection process/procedure were discussed, with time duration of one month for data collection.

4.1 Research Model

The aim of this thesis is to examine the factors which affects the acceptance of smartphone usage amongst the adult in northern Iraq. Many models have been suggested that describe users' attitude regarding technology acceptance. Davis (1986) proposed the Technology Acceptance Model (TAM) and Venkatesh et al. (2003) proposed the Unified Theory of Acceptance and Use of Technology (UTAUT). However, the two models were used in the study. The following figure is a view of the proposed research model given in Figure 4.1.



Figure 4.1: Research model of the study
4.2 Research Hypotheses

The hypotheses of this study are constructed based on the significant relationships that exist between smartphone adoption and the Technology Acceptance Model (TAM), revised TAM2 and Unified Theory of Acceptance and Use of Technology (UTUAT) constructs. The following are the list of the constructed hypotheses.

4.2.1 Attitude towards using

In this study, attitude towards using refers to the affection felt by an adult about using smartphone either positive or negative. This implies that if an adult feels using smartphone is positive then he will likely adopt smartphone else if he feels negative he might not adopt smartphone. Prior to this reason makes the following hypotheses proposed.

H1: There is a positive significant relationship between attitude towards using and perceived usefulness.

4.2.2 Perceived usefulness

The perceived usefulness construct in this study can be described as how smartphones usage by adults positively impacts the lives of these adults in such a way that this technology will even improve their lives in general. If the adults can see the potential usefulness a smartphone comes with, then there is every tendency that these adults will adopt a smartphone. This entails that the more they perceived the technology usefulness the more they adopt them. This also implies that there is a positive relationship between perceived usefulness and adopting new technology. Prior to this reason makes the following hypotheses proposed.

H2: There is a positive significant relationship between perceived usefulness and perceived ease of using.

4.2.3 Perceived ease of use

The perceived ease of use construct in this study can be described as how easy smartphone usage is to the adults. If their perception about smartphone usage is that smartphone is easy to learn and use, then definitely this implies that they are likely to adopt this technology. This concludes that the higher the perceived ease of use the higher they are likely to adopt the smartphone. Prior to this reason makes the following hypotheses proposed.

H3: There is a positive significant relationship between perceived ease of use and attitude toward using.

4.2.4 Facilitating conditions

In this study, facilitating conditions refers to some environmental objective factors that will ease smartphone usage. However, if users find themselves in such condition then they will likely adopt this technology. Prior to this reason makes the following hypotheses proposed.

H4: There is a positive significant relationship between facilitating conditions and perceived ease of use.

H5: There is a positive significant relationship between facilitating conditions and perceived usefulness.

4.2.5 Self satisfaction

In this study, self satisfaction refers to the level to which the services a product comes with gives a user satisfaction based on his achievements, if the user is fully satisfied then he will likely adopt this technology that gives him satisfaction. Prior to this reason makes the following hypotheses proposed.

H6: There is a significantly positive relationship between self-satisfaction and perceived ease of use.

H7: There is a significantly positive relationship between self-satisfaction and perceived usefulness.

4.2.6 Costs tolerance

In this study, cost tolerance refers to a level at which an individual can afford the cost adopt a smartphone based on his incomes. If a user can willingly afford the cost of smartphone then he will likely adopt it. Prior to this reason makes the following hypotheses proposed. **H8:** There is a positive significant relationship between cost tolerance and perceived ease of use.

H9: There is a positive significant relationship between cost tolerance and perceived usefulness.

4.3 Participants

The criteria used in selecting our participants was that one has to be an adult with smartphone usage experience and these adults were chosen at random in northern Iraq. We selected these adults based on different age group which where categorized as young adults 20-39 years, adults 40-59 years and old adults 60-79 years (Horng et al., 2001). Adult participants were randomly selected each from these three age categories respectively, making a total of 600 participants in all. The selection was made across four main cities in northern Iraq which comprises of Zakho, Dahouk, Sulaymaniyah and Erbil. The data collection process was conducted during the 2015-2016 Summer term.

The percentage of male and female adults used for the study was 56.2% to 43.8% respectively from four cities. Below are the characteristics of the respondents presented in Table 4.1. From the table below, there were 34.3% young adult that were 20-39 years of age, 33.8% adults that were 40-59 years old of age and 31.8% adults that were 60-79 years old.

Characteristic	Frequency	Percentage (%)
Age:		
20-39	210	35.0%
40-59	199	33.2%
60-79	191	31.8%
Gender:		
Male	337	56.2%
Female	263	43.8%
Educational Qualifications:		
Primary	119	19.8%
Secondary	146	24.3%
Higher Education	223	37.2%

Table 4.1: Important demographic data of total participants (N = 600)

None	112	18.7%
Marital Status:		
Single	168	28.0%
Married	232	38.7%
Divorced/Seperated	82	13.7%
Widowed	118	19.7%
City:		
Zakho	157	26.2%
Dahouk	151	25.2%
Sulaymaniyyah	149	24.8%
Erbil	143	23.8%
Work Status:		
Full Time	275	45.8%
Part time	190	31.7%
Retired	135	22.5%
Source of Income:		
Salary/Wage	272	45.3%
Pension	77	12.8%
Property Family	99	16.5%
Support	79	13.2%
Government subsidy	72	12.0%
Budget Limitations:		
\$15,000 - \$20,000	305	50.8%
\$20,000 - \$30,000	168	28.0%
\$30,000 – Above	127	21.2%

4.4 Data Collection Tools

Ma et al. (2016) developed this questionnaire in order to determine factors affecting the use of smartphones by the adult populace. The questionnaire is categorized into two main sections namely the demographic information and smartphone usage attitude of adult users. The demographic information will be used for the statistical analysis by dividing or grouping the adult individuals into different groups, like age, gender, cities and using the attitude data of adult user to know which belongs to which group. 9 items was assigned to the demographical section while 14 items were assigned to adult smartphone user attitude

section making a total of 23 items all together. The attitude section have some sub-sections (dimensions) which was used to answer questions about the attitude towards smartphone usage, adult users perceived usefulness of smartphones, the perceived ease use of smartphone, the facilitation conditions of smartphone usage, the self-satisfaction of the smartphone and the cost tolerance of smartphone. The participants answered these items on the scale of 5 Likert ranging from "Strongly Agree" (5 point), "Agree" (4 point), "Neutral" (3 point), "Disagree" (2 point), and "Strongly Disagree" (1 point). A reliability test was carried out on the data collected using a Cronbach Alpha, the result of the total test was 0.860 on 14 items which implies a very good result. Subsequently, the Cronbach Alpha reliability test was also carried out for each dimension of the questionnaire which can be seen below. Hence, Sipahi et al. (2010) reported that a Cronbach Alpha is reliable if and only if its resultant value is greater than or equal to 0.7 and less than or equal to 10.

Dimensions	Number of items	Cronbach's Alpha
Attitude Towards Using	2 items	0.917
Perceived Usefulness	3 items	0.843
Perceived Ease of Use	2 items	0.718
Facilitating Conditions	2 items	0.803
Self Satisfaction	3 items	0.794
Costs Tolerance	2 items	0.776
Overall Cronbach's Alpha		0.860

 Table 4.2: Cronbach Alpha reliability test for the questionnaire

4.5 Data Analysis Methods

This study is aimed at investigating the factors affecting smartphone usage and adoption amongst adults. To avoid over generalization the study focused mainly on the factors that affect the acceptance of smartphones in northern Iraq amongst adults. The collected data was analyzed with the use of IBM SPSS version 20.

One-way ANOVA was used in estimating the relationship that exists amongst the constructed dimensions from the TAM and UTAUT models. The Pearson correlation was also used in estimating the dependencies between these dimensions. Lastly, statistical tools such as percentage, mean, standard deviation and frequency were used to describe the study findings.

4.6 Procedure

After finding an appropriate research problem, a literature review of more than 20 papers was conducted. Appropriate tools for data collections were recommended regarding the location of the research. Questionnaire for the study was prepared based on the adopted theoretical frameworks which are the TAM, TAM2 and UTAUT. The prepared questionnaire contains 23 items in total. Subsequently the questionnaires were distributed to adults who have used smartphones at random within the age limit of 20-79 years across 4 cities in northern Iraq namely Zakho, Dahouk, Sulaymaniyah and Erbil. A total of 600 questionnaires were distributed to participants and were all verified. The completed data was inspected and entered into SPSS 20. Prior to entering the data a Cronbach Alpha reliability check was conducted to the data to make sure it was valid and confirming the data quality.

Afterwards the data was subject to analysis using the SPSS 20, using descriptive statistics and other statistical tools. The obtained result in the research was later interpreted using tables to describe and report the research findings.

The documentation was accomplished after the analysis and series of writing corrections and formatting with the help of the supervisor. With the overall document passing through chapter by chapter reviews and corrections from the supervisor, final feedback was received from the supervisor. The finished up to date copy of the document was made ready and formatted in a presentable format for the jury. Suggestions from the jury were implemented. After a positive response, the final copies were printed and distributed fro documentation in university and department libraries.

Finally, after some series of analysis, investigations and writings, the thesis report was proficient and completed with the help of the supervisor. Rectifications and audits of the overall document was implemented by the supervisor, the last feedback was gotten from the supervisor. The completed document was readily prepared and arranged in a well organized formatting for the jury. The jury recommended some suggestions which were properly implemented. After a positive reaction, the last duplicates were printed and dispersed for documentation to the university and library.

4.7 Duration of the Study

The below table is the duration of the current study from the start point till end of thesis:

Work done	Duration
Literature search	7 Weeks
Preparation of research proposal	2 Weeks
Preparation of data collection tools	4 Weeks
Data collection	8 Weeks
Data entry	2 Weeks
Data quality inspections	1 Week
Data analysis	4 Weeks
Writing thesis	6 Weeks
Reading, discussion and correction based on the feedback of supervisor	3 Weeks

 Table 4.3: Time schedule of the thesis



Figure 4.2: Gantt chart of the research

CHAPTER 5 RESULTS AND DISCUSSION

This chapter talks about the end result in details, in respect to the research questions and aims.

5.1 The Adults Attitudes towards Accepting Smartphone Usage

To fully understand the smartphone usage attitude amongst the adult population of northern Iraq, a descriptive analysis was carried out. The following table demonstrates the, mean and standard deviation of each obtained construct, the result obtained of most of the construct was average due to the nature of mean, which was within 4.0. The table below demonstrates mean and standard deviation of the collected answers which was based on a Likert of 5-point scale in the questionnaire.

	Mean	SD
ATTITUDE TOWARDS USING		
1. Using smartphone is a good idea.	4.51	.722
2. I like the idea of using smartphone.	4.49	.722
Sub-Total	4.50	.722
PERCEIVED USEFULNESS		
3. Using smartphone technology would enhance your effectiveness in life.	4.28	.821
4. Using smartphone technology would make my life more convenient.	4.31	.867
5. I would find smartphone useful in my life.	4.50	.666
Sub-Total	4.36	.787
PERCEIVED EASE OF USE		
6. Smartphones are easy to use.	4.22	.925
7. I can be skillful at using smartphone.	4.25	.833
Sub-Total	4.24	.879

Table 5.1: Adult's smartphone usage attitudes

FACILITATING CONDITIONS

8. I prefer having someone by my side to teach me how to use smartphones	4.31	.927
9. Training is crucial for smartphone use	4.55	.659
Sub-Total	4.43	.793
SELF-SATISFACTION		
10. Using smartphone makes me feel younger	4.52	.722
11. My sense of achievement is increased by using smartphones	4.46	.868
12. You keep pace with time by using smartphones	4.58	.710
Sub-Total	4.52	.767
COSTS TOLERANCE		
13. Using smartphones should be cheap.	4.51	.733
14. I can afford the costs associated with using smartphones	4.57	.682
Sub-Total	4.54	.708
Total	4.31	.776

According to the obtained result total (M = 4.31; SD = 0.776) from Table 5.1. It can be seen that the adults demonstrated a strong response based on the constructed scales because of all the responses are above the average (>3). This means that the adults posses strong perception on using and adopting smartphone. Ma et al. (2016) reported a similar result.

The highest mean recorded from Table 5.1 was item 12 "Smartphone help you to keep pace with the times" (M = 4.58; SD = 0.710). This might indicate the importance of time to adults especially in this modern time. This is a very good indication because it helps the adult improve their awareness with time. The second highest means recorded from Table 5.1 was item 14 "My economic status is good enough to pay for the costs of smartphone use" (M = 4.57; SD = 0.682). This shows that smartphones are affordable to use and adopt by adults. This economic indication is good because it will help many adults to adopt and use smartphones. The third highest recorded from Table 5.1 was item 9 "Training practice is useful and important for the use of smartphone" (M = 4.57; SD = 0.682). This implies that training users on how use smartphone is crucial. This indication is good because

learning about the features a smartphone comes with will enable it users exploits all its functions efficiently. Alt (2012) reported a similar result.

Alternatively, the lowest mean recorded from Table 5.1 was item 6 "*I would find smartphone easy to use*" (M = 4.22; SD = 0.925). This means that some respondents find it difficult operating smartphone due to some various reasons. This is not good because it will make adults not want to adopt or use smartphones. Second to the lowest mean recorded from Table 5.1 was item 7 "*I can be skillful at using smartphone*" (M = 4.25; SD = 0.833). This shows that some group of respondents have no believe of becoming proficient in using smartphone. This is not good because it will make some individuals not want to explore most of the features a smartphone comes with, limiting its usage to just making calls and making text messaging. The third lowest mean recorded from Table 5.1 was item 3 "*Using smartphone technology would enhance your effectiveness in life*" (M = 4.28; SD = 0.821). This implies that some respondents have low responses regarding whether smartphone using or adopting smartphone will produce the desired result. This is not good because it will cause some hesitations amongst individuals on whether or not to adopt smartphones. Zhou (2014) reported a different result but Pheeraphuttharangkoon (2015) reported a similar result.

Additionally, the following gives the details of each constructed proposed research model in order of chronology using the mean totals from Table 5.1 starting from Cost Tolerance (M = 4.54 SD = 0.708). This construct has the highest response which implies individual readiness to bear the costs of adopting and using smartphones based on individual income and weighting the value of the smartphone. This is good response because the adoption and usage of smartphone will be affordable across all. Kim et al. (2016) and Ma et al. (2016) reported a similar result.

The number 2 construct from Table 5.1 is Self Satisfaction (M = 4.52; SD = 0.767). This shows the level at which a smartphone provides its users with contentment or achievements. This is good because it will boost smartphone users to continue using it for long time to come. Mekić and Özlen (2014) reported a different result.

The number 3 construct from Table 5.1 is Attitude Towards Using (M = 4.50; SD = 0.722). This implies how it feels for an individual adoption or smartphone usage. The feelings can be positive or negative but it was positive for our correspondents. This is a

good indication because it will boost smartphone usage and adoption. Gao et al. (2015) found a similar result.

The number 4 construct from Table 5.1 is Facilitating Conditions (M = 4.43; SD = 0.793). This shows that the factors that make using smartphone easy are neutral. This is a good response because individuals will use smartphones without any hesitations about conditions that make smartphone usage not easy. Ma et al. (2016) found a similar result but for Wee et al. (2011) the result was different.

The number 5 construct from Table 5.1 is Perceived Usefulness recorded (M = 4.36; SD = 0.785). This implies the level at which an individual feels that using or adopting smartphones would make improve the overall quality of his life. The response from the correspondent was good because everybody wants the overall quality of his live to be improved this will make many individuals adopt and use smartphones. Aldhaban et al. (2015) reported a similar result.

The number 6 construct from Table 5.1 is Perceived Ease of Use (M = 4.24; SD = 0.879) was the construct with the lowest response with mean. This shows the degree at which an individual believes that using smartphone is free of efforts. This not good response because this reason might make some individuals stay away from using or adopting smartphones. Liu (2012) reported a similar result however Madlazim and Sasitharan (2014) reported a different result.

5.1.1 Smartphone Usage Attitudes amongst the Adult Population Based on Gender Differences

Independent samples t-test was used to determine the smartphone usage Attitude amongst the adult population across north of Iraq in this study. Based on the below Table 5.2, regarding the perception of smartphone usage with adults the result shows that, there is no statistical significant difference between the genders (p>.05) among most dimensions except for "Perceived Usefulness" which shows a significant differences amongst the genders. The study shows that female and male populations have no significant difference on the smartphone usage. All the constructed dimensions showed female have higher mean values of (M = 4.58; SD = 0.65) than male students which shows mean value of (M = 4.51; SD = 0.75). Kim et al. (2016) and Ma et al. (2016) reported a similar result.

Dimensions	Gender	Ν	Mean	SD	Mean Difference	t	р
Attitudes Toward Heing	Male	337	4.49	.74	02700	460	657
Attitudes Toward Using	Female	263	4.52	.69	.02700		.037
Perceived Usefulness	Male	337	4.30	.82	14066	2 174	020
	Female	263	4.44	.73	14000	-2.174	.039
Perceived Ease of Use	Male	337	3.80	.95	0575	674	575
	Female	263	3.85	.96	0373		.525
Escilitating Conditions	Male	337	4.39	.82	0850	-1.414	210
Facilitating Conditions	Female	263	4.48	.75	0850		.219
Calf Satisfaction	Male	337	4.48	.81	0022	1 550	192
Sen-Saustaction	Female	263	4.57	.71	0933	-1.555	.165
Cost Toloropoo	Male	337	4.51	.75	071	1 226	287
	Female	263	4.58	.65	071	-1.220	.207

 Table 5.2: Gender difference between smartphone users

Total Sampled Population (N); Standard Deviation (SD).

5.1.1.1 The difference between gender and perceived usefulness

Based on the above independent samples t-test analysis in Table 5.2 between gender and perceived usefulness. The result indicates that there is statistical significant difference between the gender and perceived usefulness since (p<.05). The study shows that male and female populations have significant difference on the smartphone usage. Furthermore, the constructed dimensions showed female have higher mean values of (M = 4.44; SD = 0.73) than male students which shows mean value of (M = 4.30; SD = 0.82. Zhou (2014) also found out that male and female populations have significant difference on the smartphone usage in Korea. However Joo and Sang (2013) reported a different result by stating that male and female populations have no significant difference on the smartphone usage.

5.1.2 Smartphone Usage Attitude amongst the Adult Population Based on Age Differences

One-way ANOVA was used to determine the usage attitude of adults according to age differences ranging from young adult to adults and old adults. The study shows that there is no significant. There is significant differences between all the ages towards "Perceived ease of use" amongst the adult population (p<0.05).

Dimensions	Age	Ν	Mean	SD	Mean Square	F	р
	20-39	210	4.52	.727			
	40-59	199	4.47	.727	.928	1.219	.355
Attitude Toward Using	60-79	191	4.51	.713			
	Total	600	4.50	.722			
	20-39	210	4.50	.798			
Perceived Usefulness	40-59	199	4.57	.696	.658	1.051	.369
	60-79	191	4.48	.800			
	Total	600	4.52	.765			
Perceived Ease of Use	20-39	210	4.18	.825			
	40-59	199	3.82	.931	.803	40.5	.000*
	60-79	191	3.42	.928			
	Total	600	3.81	.895			
	20-39	210	4.37	.085			
	40-59	199	4.43	.788	.182	.348	.707
Facilitating Conditions	60-79	191	4.49	.729			
	Total	600	4.43	.540			
	20-39	210	4.34	.355			
Calf Catiofastian	40-59	199	4.37	.377	.285	2.059	.128
Sen-Sausiacuon	60-79	191	4.41	.394			
	Total	600	4.37	.372			
	20-39	210	4.52	.739			
Cost Tolorongo	40-59	199	4.57	.670	.219	.446	.648
Cust Tolerallee	60-79	191	4.53	.713			
	Total	600	4.54	.708			

Table 5.3: Smartphone usage attitude based on age differences

Total sampled population (N); Standard Deviation (SD) and * means p<0.05 (there exist statistical significant difference).

In Attitude Toward Using Smartphone dimension, 20-39 years category had the highest mean values of (M = 4.52; SD = 0.727) with no significant difference with this dimension for all the age categories. While in Perceived Usefulness dimension, 40-59 years category had the highest mean values of (M = 4.57; SD = 0.696) with no significant difference with this dimension for all age categories. In Perceived ease of Use dimension, 20-39 years category had the highest mean values of (M = 4.18; SD = 0.825) with a significant difference with this dimension for all the age categories. In Facilitating Conditions dimension, 60-79 years category had the highest mean values of (M = 4.18; SD = 0.825) with a significant difference with this dimension for all the age categories. In Facilitating Conditions dimension, 60-79 years category had the highest mean values of (M = 4.49; SD = 0.729) with no significant difference with this dimension for all the age categories. In Self Satisfaction Using dimension, 60-79 years category had the highest mean values of (M = 4.41; SD = 0.394) with no significant difference with this dimension for all the age categories. In Cost Tolerance dimension, 40-59 years category had the highest mean values of (M = 4.57; SD = 0.670) with no significant difference with this dimension for all the age categories. In Cost Tolerance dimension, 40-59 years category had the highest mean values of (M = 4.57; SD = 0.670) with no significant difference with this dimension for all the age categories. Pheeraphuttharangkoon (2015) and Aldhaban et al. (2015) reported a similar result, however Joo and Sang (2013) reported a different result.

5.1.2.1 The Difference between Age Groups and Perceived Ease Of Use

According to the above one-way ANOVA analysis in Table 5.3 between age groups and perceived ease of use. The result shows that there is statistical significant difference between the age groups and perceived ease of use since (p<.05). The study implies that amongst the three age groups which are 20-39 years, 40-59 years and 60-79 years that there is significant difference on smartphone perceived ease of use. Additionally, the constructed dimension showed 20-39 years category have highest mean values of (M = 4.18; SD = 0.825), then followed by 40-59 years category with mean values (M = 3.82; SD = 0.931) while 60-79 recorded the lowest mean value of (M = 3.42; SD = 0.928). Ma et al. (2016) reported also that there is significant difference amongst age group on their perceived ease of use of use of smartphone.

5.1.3 Smartphone Usage Attitude amongst the Adult Population Based on Educational Status Differences

One-way ANOVA was also used to determine the usage attitude of adults according to educational status differences ranging from educated to non-educated individuals. There is no significant differences amongst all the educational status except towards "Perceived ease of use", "Perceived usefulness" and "Attitude towards using" amongst the adult population since (p < 0.05).

Dimensions	Educational Status	Ν	Mean	SD	Mean Square	F	р
	Primary	119	4.42	.82			
	Secondary	146	4.56	.64	006	2 0 2 1	020
Attitude Toward Using Smartphone	Higher-Education	223	4.58	.66	.900	2.921	.039
	None	112	4.37	.79			
	Total	600	4.50	.72			
	Primary	119	4.27	.84			
	Secondary	146	4.39	.71	202	2 622	022
Perceived Usefulness	Higher-Education	223	4.47	.70	.895	3.033	.055
C setumess	None	112	4.22	.87			
	Total	600	4.36	.78			
	Primary	119	3.35	.80			
	Secondary	146	4.06	.74	516	171 1	000
Perceived Ease of Use	Higher-Education	223	4.36	.65	.340	1/1.1	.000
	None	112	2.95	.78			
	Total	600	3.82	.95			
	Primary	119	4.39	.79			
	Secondary	146	4.40	.78	520	2 218	252
Facilitating Conditions	Higher-Education	223	4.38	.85	.329	2.210	.332
	None	112	4.59	.64			
	Total	600	4.43	.0793			
	Primary	119	4.34	.836			
	Secondary	146	4.37	.728	612	1 872	201
Self-Satisfaction	Higher-Education	223	4.41	.731	.012	1.072	.301
	None	112	4.48	.788			
	Total	600	4.52	.767			

Table 5.4: Smartphone usage attitude based on educational status differences

	Total	600	4.54	.706			
	None	112	4.54	.754	.199	.406	
Cost Tolerance	Higher-Education	223	4.57	.681			.752
	Secondary	146	4.56	.674			
	Primary	119	4.49	.757			

Total sampled population (N); Standard Deviation (SD) and * means p<0.05 (there exist statistical significant difference).

Based on the above one-way ANOVA analysis, the result of the study showed in Table 5.4. The highest mean values is (M = 4.59; SD = 0.644) in Facilitating Conditions dimensions with the least been (M = 2.95; SD = .786) in Perceived Ease of Use dimension. A similar result was reported by Mekić and Özlen (2014) and Hong et al. (2014) but Pheeraphuttharangkoon (2015) reported a different result.

5.1.3.1 The Difference between Educational Status and Attitude Towards using

Based on the above one-way ANOVA analysis in Table 5.4 between educational status and attitude towards using smartphone. The result shows that there is statistical significant difference between the educational status and attitude towards using since (p<.05). The study implies that amongst the four educational status which are primary, secondary, higher education and none that there is significant difference on attitude towards using the smartphones. However, the constructed dimension shows that higher education status have the highest mean values of (M = 4.58; SD = 0.66), then followed by secondary educational status with mean values of (M = 4.2; SD = 0.82) while none educational status recorded the lowest with mean value of (M = 4.37; SD = 0.79). Mekić and Özlen (2014) stated that there is statistical significant difference between the educational status and attitude towards using, however Pheeraphuttharangkoon (2015) reported a different result.

5.1.3.2 The Difference between Educational Status and Perceived Usefulness

According to the above one-way ANOVA analysis in Table 5.4 between educational status and the perceived usefulness. The result indicates that there is statistical significant difference between the educational status and perceived usefulness since (p<.05). The study implies that amongst the four educational status which are primary, secondary,

higher education and none that there is significant difference on perceived usefulness. However, the constructed dimension shows that higher education status have the highest mean values of (M = 4.47; SD = 0.70), then followed by primary educational status with mean values of (M = 4.27; SD = 0.84), then secondary educational status with mean values of (M = 4.39; SD = 0.71) while none educational status recorded the lowest with mean value of (M = 4.22; SD = 0.87). Mekić and Özlen (2014) reported that there is statistical significant difference between the educational status and attitude towards using.

5.1.3.3 The Difference between Educational Status and Perceived Ease Of Use

According to the above one-way ANOVA analysis in Table 5.4 between educational status and the perceived ease of use. The result indicates that there is statistical significant difference between the educational status and perceived ease of use since (p<.05). The study implies that amongst the four educational status which are primary, secondary, higher education and none that there is significant difference on perceived usefulness. However, the constructed dimension shows that higher educational status have the highest mean values of (M = 4.36; SD = 0.65), then followed by secondary educational status with mean values of (M = 4.06; SD = 0.74), then primary educational status with mean values of (M = 3.35; SD = 0.80) while none educational status recorded the lowest with mean value of (M = 2.95; SD = 0.78). Ma et al. (2016) reported that there is statistical significant difference between the educational status and perceived ease of use.

5.2 The Relationship between Attitude Towards using and Perceived Usefulness

To better understand the relationship between adult attitudes towards using smartphone and the perceived usefulness in northern Iraq, Pearson Correlation was used to determine the relationship. Based on the below Table 5.5, indicates that there is significant positive relationship between attitude towards using smartphones and perceived usefulness. For attitude towards using smartphones and perceived usefulness, r (598) = .450, p = .000. Thus, H1 is supported.

Table 5.5: Pearson's Correlation between Attitude Towards using Smartphone and Perceived Usefulness

		Attitude Toward using Smartphone	Perceived Usefulness
Attitude Toward using Smartphone	Pearson Correlation	1	.450**
	Sig. (2-tailed)		.000
	Ν	600	600
	Pearson Correlation	.450**	1
Perceived Usefulness	Sig. (2-tailed)	.000	
	Ν	600	600

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

This implies that an adult feeling of using smartphone is positive, prior to this reason makes him adopt smartphone. A similar result was reported by Ma et al. (2016) and Gao et al. (2015).

Examining the coefficients from Table 5.6 (F (1, 598) = 152.162; p < .05; $R^2 = .203$); the aggression model is significant. $R^2 = .203$ denoted that Perceived Usefulness accounts for 20.3% of the variance in Attitude Towards. (p<0.05), indicates that "Perceived Usefulness" had a significant positive influence on "Attitude Towards". Thus, H1 is supported.

Dependent Variable: Attitude Towards						
	В	Std. Error	β	Т	Р	Decision
(Constant)	5.043	.325		15.529	.000	
PU	.302	.025	.450	12.335	.000	Supported
Model F	152.162					- Supported
R ²	.203					
P<0.05						

 Table 5.6: Relationship between Attitude Towards using Smartphone and Perceived Usefulness

This implies that an adult feeling of using smartphone is positive, prior to this reason makes him adopt smartphone. A similar result was reported by Ma et al. (2016) and Gao et al. (2015).

5.3 The Relationship between Perceived Usefulness and Perceived Ease of Using

To better understand the relationship between adult perceived ease of using smartphone and the perceived usefulness in northern Iraq, Pearson Correlation was used to determine the relationship. Based on the below Table 5.7, indicates that there is significant positive relationship between perceived ease of using smartphones and perceived usefulness. For perceived ease of using smartphones and perceived usefulness, r (598) = .132, p = .001. Thus, H2 is supported.

		Perceived Usefulness	Perceived Ease of Use
	Pearson Correlation	1	.132**
Perceived Usefulness	Sig. (2-tailed)		.001
	Ν	600	600
	Pearson Correlation	.132**	1
Perceived Ease of Use	Sig. (2-tailed)	.001	
	Ν	600	600

 Table 5.7: Pearson's Correlation between Perceived Usefulness and Perceived Ease of using smartphone

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

This shows that their perception about smartphone usage is that smartphone is easy to learn and use, and for this reason they will to adopt smartphone because of its usefulness. A similar result was reported by Wee et al. (2011) and Ma et al. (2016).

Examining the coefficients from Table 5.8 (F (1, 598) = 1.106; p > .05; $R^2 = .002$); the aggression model is not significant. $R^2 = .002$ denoted that Perceived Ease of Use accounts for 0.2% of the variance in Perceived Usefulness Using. (p>0.05), indicates that "Perceived Ease of Use" had a significant positive influence on "Perceived Usefulness". Thus, H2 is not supported.

Dependent Variable: Perceived Usefulness						
	В	Std. Error	β	t	р	Decision
(Constant)	12.607	.467		26.982	.000	
PEOU	.057	.054	.043	1.052	.293	Not
Model F	1.106					Supported
R ²	.002					
P>0.05						

 Table 5.8: Relationship between Perceived Usefulness and Perceived Ease of Using Smartphone

This shows that their perception about smartphone usage is that smartphone is easy to learn and use, and for this reason they will to adopt smartphone because of its usefulness. A similar result was reported by Aldhaban et al. (2015), Ma et al. (2016), Kim (2014) and Wee et al. (2011).

5.4 The Relationship between Perceived Ease of Use and Attitude Toward using Smartphones

To better understand the relationship between adult perceived ease of using smartphone and the attitude towards using smartphone in northern Iraq, Pearson Correlation was used to determine the relationship. Based on the below Table 5.9, indicates that there is significant positive relationship between perceived ease of using smartphones and attitude towards using smartphone. For perceived ease of using smartphones and attitude towards use, r (598) = .118, p = .004. Thus, H3 is supported.

		Perceived Ease of Use	Attitude Toward using Smartphone
	Pearson Correlation	1	.118**
Perceived Ease of Use	Sig. (2-tailed)		.004
	Ν	600	600
	Pearson Correlation	.118**	1
Attitude Toward using Smartphone	Sig. (2-tailed)	.004	
	Ν	600	600

 Table 5.9: Pearson's Correlation between Perceived Ease of Use and Attitude Towards using Smartphone

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

This shows that their perception about smartphone usage is that smartphone is easy to learn and use, and for this reason they will to adopt smartphone. A similar result was reported by Kim (2014) and Wee et al. (2011) but not similar result to Ma et al. (2016).

Examining the coefficients from Table 5.10 (F (1, 598) = 5.202; p < .05; $R^2 = .009$); the aggression model is significant. $R^2 = .009$ denoted that Attitude Towards accounts for 0.9% of the variance in Perceived Ease of Use. (p<0.05), indicates that "Attitude Towards" had a significant positive influence on "Perceived Ease of Use". Thus, H3 is supported.

Dependent Variable: Perceived Ease of Use						
	В	Std. Error	β	t	р	Decision
(Constant)	7.531	.416		18.108	.000	
AT	.104	.046	.093	2.281	.023	Supported
Model F	5.202					- Supported
R ²	.009					
P<0.05						

 Table 5.10: Relationship between Perceived Ease of Use and Attitude Towards using Smartphone

This shows that their perception about smartphone usage is that smartphone is easy to learn and use, and for this reason they will to adopt smartphone. A similar result was reported by Wee et al. (2011) but not similar to Ma et al. (2016) result.

5.5 The Relationship between Facilitating Conditions and Perceived Ease Of Use

To better understand the relationship between adult facilitating conditions and the perceived ease of use, Pearson Correlation was used to determine the relationship. Based on the below Table 5.11, indicates that there is significant negative relationship between facilitating conditions and perceived ease of use. For facilitating conditions and perceived ease of use, r(598) = -.106, p = .009. Thus, H4 is not supported.

Facilitating **Perceived Ease** Conditions of Use -.106** Pearson Correlation 1 Facilitating Conditions Sig. (2-tailed) .009 Ν 600 600 Pearson Correlation -.106** 1 Perceived Ease of Use Sig. (2-tailed) .009 Ν 600 600

 Table 5.11: Pearson's Correlation between Facilitating Condition and Perceived Ease of Use

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

This shows that adult user find who finds themselves in a negative condition of ease of use will not adopt smartphone for usage. This shows that their perception about smartphone usage is that smartphone is easy to learn and use, and for this reason they will to adopt smartphone. A similar result was reported by Gao et al. (2015) but the result was not similar to Ma et al. (2016) and Kim (2014) result.

Examining the coefficients from Table 5.12 (F (1, 598) = 2.006; p > .05; $R^2 = .003$); the aggression model is not significant. $R^2 = .003$ denoted that Perceived Ease of Use accounts for 0.3% of the variance in Facilitating Conditions. (p>0.05), indicates that "Perceived Ease of Use" had no significant positive influence on "Facilitating Conditions". Thus, H4 is not supported.

Dependent Variable: Facilitating Conditions						
	В	Std. Error	β	t	р	Decision
(Constant)	9.318	.332		28.031	.000	
PEOU	055	.039	058	-1.416	.157	Not
Model F	2.006					- Supported
R ²	.003					
P>0.05						

Table 5.12: Relationship between Facilitating Conditions and Perceived Ease of Use

This shows that adult user find who finds themselves in a negative condition of ease of use will not adopt smartphone for usage. This shows that their perception about smartphone usage is that smartphone is easy to learn and use, and for this reason they will to adopt smartphone. A similar result was reported by Gao et al. (2015) but the result was not similar to Ma et al. (2016) result.

5.6 The Relationship between Facilitating Conditions and Perceived Usefulness

To better understand the relationship between adult facilitating conditions and the perceived usefulness, Pearson Correlation was used to determine the relationship. Based on the below Table 5.13 indicates that there is significant positive relationship between facilitating conditions and perceived usefulness. For facilitating conditions and perceived usefulness, r(598) = .342, p = .000. H5 is supported.

 Table 5.13:
 Pearson's Correlation between Facilitating Conditions and Perceived Usefulness

		Facilitating Conditions	Perceived Usefulness
	Pearson Correlation	1	.342**
Facilitating Conditions	Sig. (2-tailed)		.000
	Ν	600	600
	Pearson Correlation	.342**	1
Perceived Usefulness	Sig. (2-tailed)	.000	
	Ν	600	600

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

This shows that the environmental factor in using smartphone is positive. The result was different to Ma et al. (2016).

Examining the coefficients from Table 5.14 (F (1, 598) = 78.962; p < .05; $R^2 = .115$); the aggression model is significant. $R^2 = .115$ denoted that Perceived Usefulness accounts for 11.5% of the variance in Facilitating Conditions. (p<0.05), indicates that "Perceived Usefulness" had a significant positive influence on "Facilitating Conditions". Thus, H5 is supported.

Dependent Variable: Facilitating Conditions						
	В	Std. Error	β	t	р	Decision
(Constant)	5.672	.363		15.640	.000	
PU	.243	.027	.342	8.886	.000	Supported
Model F	78.962					_ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
R ²	.115					
P<0.05						

Table 5.14: Relationship between Facilitating Conditions and Perceived Usefulness

This shows that the environmental factor in using smartphone is positive. The result was different to Ma et al. (2016).

5.7 The Relationship between Self Satisfaction and Perceived Ease of Use

To better understand the relationship between adult self satisfaction and the perceived ease of use, Pearson Correlation was used to determine the relationship. Based on the below Table 5.15, indicates that there is significant positive relationship between self satisfaction and perceived ease of use. For self satisfaction and perceived ease of use, r(598) = .100, p = .015. Thus, H6 is supported.

		Self Satisfaction	Perceived Ease of Use
	Pearson Correlation	1	.100*
Self Satisfaction	Sig. (2-tailed)		.015
	Ν	600	600
Perceived Ease of Use	Pearson Correlation	.100*	1
	Sig. (2-tailed)	.015	
	Ν	600	600

Table 5.15: Pearson's Correlation between Self Satisfaction and Perceived Ease of Use

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

This shows that smartphones satisfaction is of enormous important regarding the ease of use of the devices. A similar result was recorded Ma et al. (2016).

Examining the coefficients from Table 5.16 (F (1, 598) = 8.193; p < .05; $R^2 = .014$); the aggression model is significant. $R^2 = .014$ denoted that Perceived Ease of Use accounts for 1.4% of the variance in Self Satisfaction. (p<0.05), indicates that "Perceived Ease of Use" had a significant positive influence on "Self Satisfaction". Thus, H6 is supported.

Dependent Variable: Self Satisfaction						
	В	Std. Error	β	t	р	Decision
(Constant)	12.323	.437		28.207	.000	
PEOU	.145	.051	.116	2.862	.004	Supported
Model F	8.193					_ ~~
R ²	.014					
P<0.05						

 Table 5.16: Relationship between Self Satisfaction and Perceived Ease of Use

This shows that smartphones satisfaction is of enormous important regarding the ease of use of the devices. A similar result was recorded Ma et al. (2016).

5.8 The Relationship between Self Satisfaction and Perceived Usefulness

To better understand the relationship between adult self satisfaction and the perceived usefulness, Pearson Correlation was used to determine the relationship. Based on the below Table 5.17, indicates that there is significant positive relationship between self satisfaction and perceived usefulness. For self satisfaction and usefulness, r(598) = .543, p = .000. Thus, H7 is supported.

		Self Satisfaction	Perceived Usefulness
	Pearson Correlation	1	.543**
Self Satisfaction	Sig. (2-tailed)		.000
	Ν	600	600
	Pearson Correlation	.543**	1
Perceived Usefulness	Sig. (2-tailed)	.000	
	Ν	600	600

Table 5.17: Pearson's Correlation between	Self Satisfaction	and Perceived	Usefulness
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**. Correlation is significant at the 0.01 level (2-tailed).

This shows that smartphones satisfaction is of enormous important regarding its usefulness to users. A similar result was reported by Wee et al. (2011) and Ma et al. (2016) result.

Examining the coefficients from Table 5.18 (F (1, 598) = 250.097; p < .05; R^2 = .295); the aggression model is significant. R^2 = .295 denoted that Perceived Usefulness accounts for 29.5% of the variance in Self Satisfaction. (p<0.05), indicates that "Perceived Usefulness" had a significant positive influence on "Self Satisfaction". Thus, H7 is supported

Dependent Variable: Self Satisfaction						
	В	Std. Error	β	t	р	Decision
(Constant)	6.867	.428		16.045	.000	_
PU	.511	.032	.543	15.814	.000	Supported
Model F	250.097					- ~~FF
R ²	.295					
P<0.05						

This shows that smartphones satisfaction is of enormous important regarding its usefulness to users. A similar result was reported by Wee et al. (2011) and Ma et al. (2016) result.

5.9 The Relationship between Cost Tolerance and Perceived Ease of Use

To better understand the relationship between adult cost tolerance and the perceived ease of use, Pearson Correlation was used to determine the relationship. Based on the below Table 5.19, indicates that there is no significant relationship between cost tolerance and perceived ease of use. For cost tolerance and perceived ease of use, r (598) = .056, p = .172. Thus, H8 is not supported.

Table 5.19: Pearson's Correlation between Cost Tolerance and Perceived Ease of Use

		Cost Tolerance	Perceived Ease of Use
	Pearson Correlation	1	.056
Cost Tolerance	Sig. (2-tailed)		.172
	Ν	600	600
	Pearson Correlation	.056	1
Perceived Ease of Use	Sig. (2-tailed)	.172	
	Ν	600	600

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

This shows that cost is not tolerated by adults if regarding the simplicity of the smartphone usage. A similar result was recorded by Ma et al. (2016).

Examining the coefficients from Table 5.20 (F (1, 598) = 1.869; p > .05; $R^2 = .003$); the aggression model is not significant. $R^2 = .003$ denoted that Perceived Ease of Use accounts for 0.3% of the variance in Cost Tolerance. (p>0.05), indicates that "Perceived Ease of Use" had no significant positive influence on "Cost Tolerance". Thus, H9 is not supported.

Dependent Variable: Cost Tolerance						
	В	Std. Error	β	t	р	Decision
(Constant)	8.694	.289		30.050	.000	Not
PEOU	.046	.034	.056	1.367	.172	Supported
Model F	1.869					_
R ²	.003					
P>0.05						

 Table 5.20: Relationship between Cost Tolerance and Perceived Ease of Use

This implies that cost is tolerated by adults if the perceived smartphone is useful to their lives. A different result was recorded by Ma et al. (2016).

5.10 The Relationship between Cost Tolerance and Perceived Usefulness

To better understand the relationship between adult cost tolerance and the perceived usefulness, Pearson Correlation was used to determine the relationship. Based on the below Table 5.21, indicates that there is significant positive relationship between cost tolerance and perceived usefulness. For cost tolerance and perceived usefulness, r (598) = .543, p = .000. Thus, H9 is supported.

		Cost Tolerance	Perceived Usefulness
	Pearson Correlation	1	.543**
Cost Tolerance	Sig. (2-tailed)		.000
	Ν	600	600
	Pearson Correlation	.543**	1
Perceived Usefulness	Sig. (2-tailed)	.000	
	Ν	600	600

Table 5.21: Pearson's Correlation between Cost Tolerance and Perceived Usefulness

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

This implies that cost is tolerated by adults if the perceived smartphone is useful to their lives. A different result was recorded by Ma et al. (2016).

Examining the coefficients from Table 5.22 (F (1, 598) = 124.385; p < .05; $R^2 = .172$); the aggression model is significant. $R^2 = .172$ denoted that Perceived Usefulness accounts for 17.2% of the variance in Cost Tolerance. (p<0.05), indicates that "Perceived Usefulness" had a significant positive influence on "Cost Tolerance". Thus, H8 is supported

Dependent Variable: Cost Tolerance						
	В	Std. Error	β	t	р	Decision
(Constant)	5.718	.306		18.715	.000	
PU	.257	.023	.415	11.153	.000	Supported
Model F	124.385					_ Supported
R ²	.172					
P<0.05						

 Table 5.22: Relationship between Cost Tolerance and Perceived Usefulness

This shows that cost is not tolerated by adults if regarding the simplicity of the smartphone usage. A similar result was recorded by Ma et al. (2016).

5.11 Summarized Decisions

Table 5.23 provides the complete list of the study hypotheses and the summarized decisions based on the results. The corresponding result is either supported or not-supported.

Hypotheses	Decision
H1: There is a positive significant relationship between attitude towards using and perceived usefulness.	Supported $(\beta = .450, p = <0.05)$
H2: There is a positive significant relationship between perceived usefulness and perceived ease of using.	Not Supported $(\beta = .043, p = >0.05)$
H3: There is a positive significant relationship between perceived ease of use and attitude toward using.	Supported $(\beta = .093, p = <0.05)$
H4: There is a positive significant relationship between facilitating conditions and perceived ease of use.	Not Supported $(\beta =053, p = >0.05)$

 Table 5.23: Hypotheses summary and decisions of the study

H5:	There is a positive significant relationship between facilitating conditions and perceived usefulness.	Supported $(\beta = .342, p = <0.05)$
H6:	There is a positive significant relationship between self- satisfaction and perceived ease of use.	Supported ($\beta = .116$, p = <0.05)
H7:	There is a positive significant relationship between self- satisfaction and perceived usefulness.	Supported $(\beta = .543, p = <0.05)$
H8:	There is a positive significant relationship between cost tolerance and perceived usefulness.	Supported $(\beta = .541, p = <0.05)$
H9:	There is a positive significant relationship between cost tolerance and perceived ease of use.	Not Supported ($\beta = .056$, p = >0.05)

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

This chapter wraps up our study conclusively, and as well contains recommendations for future works.

6.1 Conclusion

The growth of social network sites, particularly Facebook has captured the attention of many researchers in considering incorporating the social network into Higher Education. The study has revealed that social network sites are used by students of different ages and educational levels. 308 students from Duhok University in Northern Iraq participated in this study. Findings revealed that Facebook adoption has a significant positive relationship on Perceived Usefulness and Ease of use. There was also a significant positive relationship between Educational usage and Communication. In addition, results also showed that there was no significant influence between Educational usage and the following variables (Collaboration and Materials and Resource Sharing) as well as between Facebook adoption does not have a significant influence on Social Influence, Facilitating Conditions and Community Identification. Furthermore, results showed that Perceived Usefulness is deemed as the most important factor in considering Facebook adoption. Similar findings are supported by several researchers in the literature (Mazman & Usluel, 2010; King & He, 2006; Ngai et al., 2007; VanRaaij & Schepers, 2008).

Several factors should be taken into account by educational institutions before adopting Facebook as part of their learning system. Dedication and commitment are crucial for both the teacher and students to achieve success. Posting too much content may also lead to confusion and information overload (Mazman & Usluel, 2010). Even though some researchers may deem the usage of Facebook as a distraction to academic success, it is crucial for academic institutions to fully understand that we are now living in the 21st century and the Net Generation (NG) students are multi-taskers, they can use social networks effectively and most electronic gadgets without a user manual (Seke, 2015). Such a generation live in a digital world and is surrounded by the social media sphere.

Institutions should not just create a Facebook page because their rivals are doing so. It is important for Facebook pages to be constantly updated and respond promptly to messages. In conclusion, Facebook is a great platform that can be used to enhance learning in Higher Educational institutions because of its appealing interface and its ability to facilitate online discussion.

6.2 Recommendations

Regarding the above study findings, to motivate the adult population in regards to the usage of smartphones all difficulties should be eliminated, problems such as technological, environmental and personal. Below are some suggested recommendations to motivate adult individuals in northern Iraq. Since cost is one of the major factors affecting the acceptance of smartphone, a special plan should be provided for these individuals to scrap this cost by either the manufactures or telecommunication operators. Education and learning ability of many Iraqis adults is low; this shows that there is need for appropriate training programs to improve this situation. And when considering older adults facilitating conditions seems to be very important because they need a better environment during smartphone usage, training older adult smartphone users should be considered when introducing an unfamiliar technology and these training will cost some money which should also be considered (Sharia et al., 2004). There are lots of reports about adult users attending workshops and training individuals helps in building self-confidence when using smartphones (Lagana, 2008; Lam & Lee 2006). Finally, further study should be carried out targeting more cities in Iraq particularly the southern part.

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APPENDIX

THE QUESTIONNAIRE

FACTORS AFFECTING THE ACCEPTANCE OF SMARTPHONE BY ADULTS

The aim of the questionnaire is to investigate which factors affect the acceptance of smartphones by adults. This questionnaire is explicitly designed for a thesis research study. All information collected will be used strictly for the purpose of this thesis work and treated with outmost confidentiality. The collected data of the questionnaire will be used as a report in Master Thesis at the Department of Computer Information System, Near East University.

Please, make sure you answer all questions and feel free to give correct information. Thanks for your considerations.

> Mohamed Ismael Salih (Master Student) Prof. Dr. Nadire ÇAVUŞ (Supervisor)

SECTION I: Demographic Information

1.	Age:							
	a) 20-39	b) 40-59	c) 60-79					
2.	Gender:							
	a) Male	b) Female						
3.	Educational Qualification:							
	a) Primary	b) Secondary	c) Higher Education	d) None				
4.	Marital Status:							
	a) Single	b) Married	c) Divorced/Seperated	d) Widowed				
5.	City:							
	a) Zakho	b) Dahouk	c) Sulaymaniyah	d) Erbil				
6.	Occupation							
7.	Work Status:							
	a) Full time	b) Part-Time	c) Retired					
8.	Source of Income:							
	a) Salary/Wage	b) Pension	c) Property Family	d) Support				
	e) Governmen	nt Subsidy						

- 9. Budget Limitations:
 - a) \$15,000 \$20,000 b) \$20,000 \$30,000 c) \$30,000 Above

SECTION II: Usage Attitudes of Adult Users

Items			Agree	Neutral	Disagree	Strongly Disagree
ATTITUDE TOWARDS USING (AT)						
1.	Using smartphone is a good idea.					
2.	I like the idea of using smartphone.					
PERCEIVED USEFULNESS (PU)						
3.	Using smartphone technology would enhance my effectiveness in life.					
4.	Using smartphone technology would make my life more convenient.					
5.	I would find smartphone useful in my life.					
PERCEIVED EASE OF USE (PEOU)						
6.	I would find smartphone easy to use.					
7.	I can be skillful at using smartphone.					
FACILITATING CONDITIONS (FC)						
8.	It is important to have someone who can help me tackle the problems in the use of smartphone.					
9.	Training practice is useful and important for the use of smartphone.					
SEL						
10.	Using smartphone makes me feel or look younger.					
11.	Using smartphone increases my sense of achievement.					
12.	Smartphone help me to keep pace with the times.					
COSTS TOLERANCE (CT)						
13.	The daily cost of smartphones should be economical.					
14.	My economic status is good enough to pay for the costs of smartphone use.					

Please check that you have completed the questionnaire in full. Thank you for completing our questionnaire, your input was appreciated.