University of Brighton

ADOPTION AND ACCEPTANCE OF MOBILE COMMERCE IN SAUDI ARABIA:
THE CASE OF E-TICKETING IN THE AIRLINE INDUSTRY

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Abstract

Mobile technology has influenced business strategies over recent years and the increasing penetration of mobile devices and related solutions such as mobile commerce has revolutionised consumer organisations. Saudi Arabia with its high mobile penetration has the potential for higher usage of mobile services in the near future. This research aimed at understanding and evaluating the acceptance and adoption of mobile commerce in Saudi Arabia with specific focus on the airline ticketing services through evaluation of the attitude and behaviour of the airline consumers towards mobile commerce in airline ticketing services. The research was designed as a mixed and explanatory research and used both deductive and inductive approaches to understanding mobile commerce acceptance in airline ticketing services. The research also involved extensive review of technology adoption models such as Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), based on which a research framework was developed and hypotheses specified. Quantitative study involved online questionnaire based survey with 207 travellers who were connected at the King Abdul-Aziz airport in Saudi Arabia, while qualitative study involved interviews with eight employees of Saudi Airlines. The collected data was analysed using MS Excel and SPSS and subjected to descriptive, regression and content analysis.

The research findings indicate positive perceptions of airline travellers towards the usefulness, ease of use and other related benefits of using mobile commerce for air ticketing services. The key factors influencing the attitude were identified to be the ease of use, usefulness and social influence, while key determinants of behavioural intention were identified to be mobility, compatibility and usefulness. The other factors such as cost, trust, perceived risk and use-context were not found to be the key influencers of the behavioural intention of Saudi Arabian travelers towards use of mobile commerce for airline ticketing services. Another key finding was the lack of any significant differences, perhaps surprising, in the behavioural intention to use mobile commerce across various demographic groups based on age, gender and education. The research findings will be useful for both practitioners of mobile commerce as well as academicians involved in research on acceptance and adoption of mobile commerce. Moreover, the research findings are not just useful for the airline industry in Saudi Arabia, but can also be consulted by those interested in understanding mobile-commerce acceptance in airline industry anywhere else across the globe or any other industry in Saudi Arabia.

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1 CHAPTER ONE: INTRODUCTION

1.1 Background

Developments in information technology (IT) over the last couple of decades have changed the manner in which the business happens and IT has influenced the manner in which firms interact and serve their customers. IT has also become a source of competitive advantage for the organisations that have been able to develop and implement IT solutions that have added immense value to their customers and helped them in offering seamless transactions to their customers across their physical and virtual presence (Jahanshahi et al., 2011). Wireless or mobile technology has added another dimension to the IT solutions offered to the customers and mobility has offered ubiquity to the operations and services offered by an organisation (Siau et al., 2004). Mobile-commerce specifically has been cited to be a major revolution for the consumer organisations due to the high penetration of mobile technology especially in Western and other countries like Saudi Arabia (Nielsen, 2014).

Consumer industries such as the travel and airline industry are driven by the customer transactions to either purchase the services offered by the airlines, manage their purchases or to seek further information on the services of the organisation (Burmistrov, 2009). Also, due to the perishable nature of the service, airlines aim at increasing the productivity of their available seats by presenting their services to the customers across multiple channels including airport counters, travel agents and websites as well as online travel portals (intermediaries) (Kapoor et al., 2013). Advancement in IT has brought about changes in the strategies and processes in the airline industry and while some solutions such as websites have been the initiatives of the organisation, others like the travel portals have been an external force to which the airlines have had to adapt (Meuter et al., 2005). However, these developments have also ensured higher seat load factors for the airlines (Harteveldt, 2012) due to better availability of information to the customers (Kapoor et al., 2013). Almost half of the airline tickets are now booked through the online route, indicating the acceptance of e-ticketing amongst airline customers (Siwicki, 2014).

However, another ticketing channel that has emerged for the airlines over the last few years is the mobile-ticketing platform that needs to be developed by the airlines due to its increasing popularity amongst the customers as well as the obvious benefits due to the ubiquity and

mobility benefits offered by the platform (Mallat et al., 2006). Airlines have invested in development of information technologies including internet and mobile based solutions for ticketing, operations and customer service functions due to their dispersed operations and transactions, which translate into higher staff and facility expenses and thus immense cost-saving benefits for the airlines in switching their customers to virtual transactions (Harteveldt, 2012). The airline industry thus presents a situation where the firms in the industry will be forced to adopt innovative web and mobile technologies due to their strategic benefit to the growth and profitability of the organisation and competitive disadvantage in case the firm fails to capitalise on the benefits of these technologies for their sales and service operations (Mohammadi et al., 2011). Mobile technology in addition to the sales and service operations, has also been found to benefit the marketers in better engagement of the users due to the ability of the mobile devices to identify the location of the users as well as update the marketers on their activities (Cheng & Huang, 2013), which can then be used by the firms to develop customised solutions for the customers to encourage sales.

Mobile-commerce, which has been defined as the commerce or exchange of goods and services that happens through the mobile devices (Long, 2005), has thus emerged as an interactive and high-engagement platform for the marketers that can happen from any location across the globe at any time of the day. Mobile-commerce has already become more than half of the total electronic-commerce in countries like Japan and South Korea due to high penetration of mobile devices, development of mobile applications by key e-commerce firms (Nielsen, 2014) as well as the unique feature of ubiquity and mobility that becomes an added value for the customers (Kapoor et al., 2013). Some of the other benefits associated with mobile-commerce include the potential for personalisation, easy access, flexibility, localisation, faster transactions as well as easy availability of information (Burmistrov, 2009). Moreover, specifically in the airline industry, mobile technology becomes essential to be able to offer integrated offerings through third party applications such as travel portals. Use of mobile applications by the customers also makes it easier for the airlines to identify their customers and update them in real time basis to improve their service experience (Mohammadi et al. 2011).

The above background information suggests that it is in the interest of the airlines to promote the use of mobile-commerce amongst their customers or air travellers due to the potential savings as well as the mobile applications becoming a source of higher engagement and competitive advantage for the organisation (Mallat et al., 2006). However, from the consumer

end, while mobile technology has been easily adopted due to higher perceived benefits, the adoption of mobile-commerce has been slower due to the apprehensions related to the payment gateway, security of the platform and sometimes their inability to carry out transactions on the platform (Alqahtani et al., 2014). The adoption of mobile-commerce as an innovative technology has been studied by researchers based on the technology adoption models to understand the factors that influence the adoption of this innovative technology (Yang et al., 2013). These factors have been found to be either linked to the technology itself or the attitude and behaviour of the users towards the technology due to their perceptions regarding their ease of use, usefulness, cost, trust, risk as well as social influence. Moreover, these perceptions have also been found to vary based on the demographics, making technology adoption contextual (Mallat et al., 2006).

1.2 Rationale

One industry that has been greatly influenced by the emergence of electronic and mobile-technology is the travel and tourism industry, which, due to the dispersed nature of the business, has benefited from the integration of the multiple platforms that can be accessed by the consumers to seek information or purchase services from firms operating in the industry (Siwicki, 2014). Moreover, due to the mobility of travellers, mobile technology due to its ubiquity and mobile features presents an opportunity for the marketers to reach a larger base of consumers through this technology and improve their sales (Hohenberg & Rufera, 2004). E-commerce and mobile-commerce however have also been found to be easily accepted in industries that deal with standardised offerings (Cheng & Huang, 2013) such as the airline tickets and related services. Revenue from sales of airline tickets continues to be the largest proportion of total revenue generated through the e-commerce channel, with almost 56% of the revenue to be generated from airline tickets by 2016 (Harteveldt, 2012). Out of this almost half of these online sales are expected to happen through the mobile platform by 2018 and this underlines the importance of the channel for the marketers (Siwicki, 2014).

Saudi Arabia enjoys a high level of mobile penetration due to its high urbanisation and per capita income as well as technological infrastructure available in the country (eMarketer Inc., 2015). However, even with the high penetration of mobile technology, mobile-commerce is still in the early stages with low adoption levels as compared to countries like Japan, UK and the US (Nielsen, 2014; Alqahtani et al., 2014). Saudi Arabia is also culturally unique due to

the strong influence of religion on consumer behaviour, 80 percent urbanisation and limitation placed on the role and activities of women in the society (Royal Embassy of Saudi Arabia, 2015) and thus to be able to understand the adoption of any technology in the kingdom, research needs to be specifically designed for the region. Research on the acceptance of e-commerce and use of internet for airline ticketing and related services has been carried out previously (Mallat et al., 2006), but the research on the adoption of mobile commerce in Saudi Arabia is limited and research with specific focus on the airline industry is even more limited (Alqahtani et al., 2014). Thus the situation's high mobile penetration, limited use of mobile-commerce as well as limited research on the subject requires detailed investigation on the attitude and behaviour of Saudi consumers regarding mobile-commerce. Moreover, acceptance and adoption of an innovative technology has also been found to be influenced by the culture (Png et al., 2001; Tredinnick, 2008). The research is thus needed to fill the gap in the existing knowledge on acceptance and adoption of mobile commerce for air ticketing services with specific focus on Saudi Arabia. The research is expected to provide air travel and ticketing firms in Saudi Arabia on the motivators and obstacles for mobile ticketing services in the country to enable them to identify strategies and processes that will be most suitable for their mobile-commerce initiatives.

1.3   Research aims and objectives

The research has thus been carried out with the aim of identifying the factors that influence the adoption of mobile commerce for the airline ticketing services in the Kingdom of Saudi Arabia. Through this, the research aims at evaluating the strategies that can be used by airline companies in designing and presenting their mobile-commerce solutions to their customers. The research has also aimed at comparing the key features of mobile commerce with electronic commerce to identify factors that differentiate the two transaction modes. While the findings of the research will be directly aimed at the airline industry in Saudi Arabia due to the contextual factors influencing the Saudi Arabian air travellers, the research also aims at developing theoretical framework for adoption of mobile commerce in ticketing and air ticketing across the globe. The key objectives of the research are:

- To evaluate the adoption and acceptance of mobile-ticketing services amongst the air travellers in Saudi Arabia

- To evaluate the attitude and behaviour of the air travellers in Saudi Arabia towards use of mobile-commerce for their ticketing needs
- To identify the key determinants of the attitude and behaviour of the air travellers in Saudi Arabia towards use of mobile-commerce for their ticketing needs
- To evaluate the influence on demographic differences on the attitude and behaviour of the air travellers in Saudi Arabia towards use of mobile-commerce for their ticketing needs

  To develop and validate the conceptual framework suitable to evaluate the consumer adoption of mobile-ticketing services in Saudi Arabia

1.4   Structure of the thesis document

This document has been divided into seven chapters: introduction, literature review, methodology, results and analysis, discussion and conclusion. The breakup for each chapter has been provided in Figure 1, below..

The first chapter introduces the thesis and provides information on the background and rationale for the research, which is followed by aims and objectives of the research and finally an insight into the structure of the thesis document.

The second chapter provides a general background to the study by detailing its cultural and historical development as well as describes the geographical features and political structure in the Kingdom of Saudi Arabia (KSA)

The third chapter reviews the existing literature on the subject of mobile-commerce and also reviews related literature on electronic-commerce and theories of technology adoption that can help provide the conceptual framework on which the research can be carried out. This chapter also reviews the available literature on the emergence and acceptance of mobile commerce in the developing world as well as literature specific to e-ticketing and mobile-ticketing.

The fourth chapter covers the methodology that has been used to carry out the research and justifies the research design and techniques and procedures used to achieve the research objectives. This chapter also covers the tools used for analysing research data, research limitations as well as the ethical considerations associated with the research.

The fifth chapter covers the findings of the research based on the data collected using the quantitative survey with the airline passengers and qualitative interviews carried out with the airline staff. Descriptive and explanatory analysis using correlation and regression analysis has been used for the quantitative survey, while thematic analysis has been used to analyse the data collected through the qualitative interviews with the airline staff with the objective of identifying the determinants of the adoption of mobile-commerce for ticketing needs of airline travellers.

The sixth chapter discusses the research findings in light of the past literature on the subject and covers the testing of the research hypotheses as well as addressing the research objectives through discussion on the key factors that were found to influence the acceptance of mobile-ticketing services by the air travellers in Saudi Arabia.

The seventh chapter concludes the thesis with summarising the key findings of the research and development of a theoretical framework based on the research findings. This chapter also covers the contribution of the research to the existing theory as well as the implications for the managers practicing mobile-commerce technology. This chapter also covers the research limitations and discusses the possibilities for future research based on the findings and design of their research.

Introduction
- Background
- Rationale
- Aims and objectives
- Structure of the thesis

General Background
- History, geography and political structure
- Economy of Saudi Arabia

Literature review
- History of e-commerce and mobile-commerce
- Theories of technology adoption
- Mobile-commerce in developing world
- electronic and mobile ticketing

Methodology
- Research design - paradigm, approach, design, strategy
- Techniques and procedures - survey and interview
- Data analysis
- Ethical considerations and limitations of the research

Results and analysis
- Results of quantitative survey and interviews
- Correlation and regression analysis
- Thematic analysis for interview data

Discussion
- Hypothesis testing
- Research questions

Conclusion
- Key findings and research framework
- Research contribution and limitations
- Possibilities for further research

Figure 1: Structure of the thesis

2 CHAPTER TWO: BACKGROUND ON SAUDI ARABIA

The study is based in Saudi Arabia and this chapter provides a background to the study by detailing its cultural and historical development as well as describing the geographical features and political structure in the Kingdom of Saudi Arabia (KSA) especially focusing on the travel habits including the penetration of technology and the perceived usefulness of it in the light of the cultural impact of women not being allowed to travel alone or without a written permission from their father in case of unmarried women and from husband in case they are married or any male within the family.

2.1 History

This section describes the historical evolution of Saudi Arabia in terms of its people, trade, culture, religion and politics. Being part of a desert presented tough living conditions in the Arabian Peninsula and while hunting and gathering were historically the main occupations, once inhabitants moved to oases and valleys, agriculture started in the country (Bowen, 2014). Due to its favourable geographical location between the Nile Valley and Mesopotamia on the caravan route, trading of dried fruits and spices began with other regions, but still due to the extensive desert, the Peninsula was not invaded by outsiders and remained unaffected by European political struggles.

The Peninsula region was also influenced by the teaching of Prophet Mohammad (Circa 620), which t later developed into the Islamic religion and his presence in Mecca and Medina led to people from other countries visiting the Peninsula. This led to transfer of culture and knowledge between the regions and led to the Peninsula becoming a hub of medicine, literature, biology, philosophy and astronomy (Saudi Embassy 2012).

Political struggles in the Peninsula led to disintegration of Kingdom in the 17th century and several changes over the next few centuries, but finally in 1932, the region was integrated into Kingdom of Saudi Arabia with the inclusion of Mecca and Medina, Riyadh as the capital and King Abdulaziz as the ruler. Some of the other landmarks include discovery of oil (1938), development of education (1957), focus on social, economic and industrial development (1964) and overall prosperity in the Kingdom (1975). Another landmark has been the authorization of municipal elections in 2005 (Saudi Embassy 2012). In recent years, the Kingdom has ensured

higher exposure to Western professional education and reforms including professional opportunities and voting rights for women (2011) and has played a vital role in suppressing terrorism (Bowen, 2014).

2.2   Geography

2.2.1   Physical geography

In terms of its geographical location, Saudi Arabia is part of the Middle-East and is strategically located close to Europe, Asia and Africa. The map below shows its neighbouring countries as Yeman in the South, Oman in the Southeast, Persian Gulf, the United Arab Emirates, Qatar and Bahrain in the East, Red Sea on its West and Jordan, Iraq and Kuwait in the North. With an area of 2,149,690 square kilometres, Saudi Arabia is the thirteenth largest country in the world.

Figure 2: Map of Saudi Arabia (Source: http://travel.state.gov/travel/cis_pa_tw/cis/cis_1012.html)

However, almost a quarter of its area is barren and hostile desert and country does not have any permanent streams. There are rugged mountain ranges in the Southwest as well as coastal areas, but the climate throughout the country is that of a desert with high temperatures during

the day and very low temperatures at night (U.S. Department of State, 2011). The country also has distinct seasons with hot summers, cold winters, spring, autumn as well as monsoons from the Indian Ocean, but rainfall is very limited.

2.2.2 Social Geography

Saudi Arabia has four major cities, Riyadh, Jeddah, Mecca and Medina, which have a population of over one million each, with Riyadh being the capital and largest in the area. Riyadh is well-developed with world-class infrastructure that includes the King Khalid International Airport that connects it to the world. Jeddah, however, is the most cosmopolitan being a gateway for the pilgrims coming into Mecca (CIA, 2012), while Mecca and Medina are regarded as the holiest cities. Medina is also the summer capital, home to the port hub in Dammam as well as the petroleum production and refinery and other oil and educational institutions like the King Fahd University. The other key but smaller cities in the Kingdom include Abha, Al-Khobar, Buraydah, Hafr Al-Batin, Hail, Jubayl, Tabouk, Taif and Yanbu (CIA, 2012).

2.2.3 Demographics

Saudi Arabia is estimated to have a population of just above 26 million as per the 2012 census, which makes it 46th most populated in the world. Out of this, almost 20 percent are non-Saudi, foreign workers from countries like India, Pakistan and Sri Lanka. Around 3% population is above 65 years, 68.2% in 16-64 years and 28.8% is less than 15 years of age (CIA, 2012). Amongst the native population, around 10% are of Afro-Asian origin due to historical inflows in the region, however some pilgrims also stay back in the country due to religious reasons.

2.2.4 Culture, language and religion

Saudi culture has evolved over the years but largely governed by Shariah laws of modesty, which reflects in their reticent dressing. The culture of the country has evolved in part due to the inflow of pilgrims and their knowledge. Arabic is the official language, even though dialects may vary across regions and English is the compulsory second language. Other languages like Urdu, Farsi and French are also spoken in the region. In terms of religion, 95% natives follow Islam, out of which 85% are Sunni Muslims, while only 10-15% are Shias. Around 3% of natives follow Christianity. The country covers more than 80% of the Arabian

Peninsula and is the leading exporter of petroleum in the world. It is a monarchy with diverse cultural differences, which might present challenges to new companies working in the country. Due to the diverse cultural differences, Intercultural Training Middle East Programmes was established to help all the concerned parties in the country to take advantage of the cultural differences (Royal Embassy of Saudi Arabia, 2015)

Most of the architectural buildings in the country have been influenced by Islam and it hosts the two most famous pilgrimages i.e. Mecca and Medina. Some of the key cultural features include Hajj, which is an Islamic pilgrimage taken during eight to the twelfth of the last month in the Islamic almanac, prayer five times a day (Fair, Dhuhr, Asr, Maghrib and Isha), Ramadan, which includes fasting for almost a month and the norms of dressing and behaviour expected as per Islam. Very strong conformance to modest dressing, communal behaviour, fidelity, respect for women and children is required for social inclusion. In terms of food, pork, alcohol and non-Halal food are prohibited in Islam. For their dressing, the men wear the Ghutrah, which is a headdress, the Agal, which fastens the Ghutrah, the Thwab, the ankle length robe and the Bisht, the ceremonial dress (Royal Embassy of Saudi Arabia Tokyo, 2008). Women also follow modest dressing in public and wear the Abaya, a black cloak that cover the entire body except head, for which they might use a veil (niqa`b) which is not mandatory. Women however also use distinct decorations of motifs, sequins and appliqués on their dresses. Most of the patterns used on the buildings have their origin in the Quran. The two major festivals in the Kingdom are the Jenadriyah Heritage and Cultural Festival, both of which are held twice a year and provide a look into the rich cultural past of the Kingdom. Traditionally, Saudi Arabian people strongly prefer to wear their traditional dresses to Western way of dressing. In Saudi Arabia, jewelry is both a means of decorating oneself and a symbol of social and economic status. The people love to listen to folk music and their meals are mainly composed of meat and usually very spicy. This uniqueness makes the country different from most other Arabian countries (Royal Embassy of Saudi Arabia, 2015). Different forms can be used to express the Arabian culture such as dancing, music and art. The tone of voice is usually used to express the meaning of words. Oral practices have perfected the art of listening, which is very important in developing countries. Many songs and dance moves are transmitted via the use of oral means. Music is an important aspect as it is a form of communication and it has a functional duty. Songs are usually used during marriage, birth, during celebrations of rites of passage and at political periods. Dancing plays a very crucial part in the Arabian culture. It usually

accompanied by customs, masks, painting the body and making use of props. Though music is an important part of the Arabian culture, there exist other forms of art used for expression. Couples represent strength and honor because it is unusual for people to publicly display their affections. A picture of mother and son portray the strong family bonds, which exists between the two. The males are depicted to represent honor to the departed ancestors. A lot of emphasis is put on warfare as it depicts the art of survival and power.

With this background, the culture of Saudi Arabia needs to be understood to evaluate the impact of culture on the technology adoption in the country.

2.3   Political structure

Saudi Arabia is a monarchy and only direct descendants of King Abdul Aziz Al Saud can head the government. Majlis Al-Shura is a 150 member Consultative Council that runs the government under 22 Cabinet ministries. These members are appointed by the king and advise him. Each of the thirteen provinces in the Kingdom have a governor, their deputies and a council carrying out government duties. Sharia laws form the basis of the judicial system and the Holy Quran is the constitution. Saudi Arabia does not have or recognise any political parties (Bowen, 2014).

Human rights in Saudi Arabia are also determined from the Islamic Shariah and various human rights bodies have been formed to protect and administer these. However, in case of an offence, corporal punishments such as flogging, amputation, stoning etc are used depending on the severity of the offence (Bowen, 2014). The society is also highly discriminating towards women, such as restrictions on their driving and participation in sports, and women, while forming 70% of university enrolment, form only 5% of the workforce. The country also does not offer freedom of communication or religion within its boundaries.

2.3.1   Education and healthcare

Education in the Kingdom has transformed over time and each male and female in the Kingdom is expected to receive at least 14 and 13 years of school education respectively. The Kingdom has 24 public and 8 private universities, 25000 colleges and other institutions that offer free education, books and healthcare to the citizens and have thus ensured literacy rates of 84.7% in males and 77.8% in females. Education system is aligned with the developmental goals of

the government and in ensuring high quality and relevant workforce in future (Ministry of Higher Education 2010).

Saudi Arabia has world-class modern healthcare that is offered free to the citizens and healthcare is part of the social-services programs where even the medicines are subsidised (Oxford Business Group 2010). This has led to life expectancy of 76 years of females and 72 years for the males.

2.4   Economy

Saudi Arabia's economy is driven by oil and gas resources (CIA, 2012), which account for one-fifth of the world reserves and make it the largest producer and exporter of oil. Besides these, minerals and agriculture also support the economy but oil and gas is responsible for 80% of revenues (Saudi Embassy, 2012). Government however invests heavily in development of alternate industries and infrastructure to attract investments in the country. While 80% of the employees are however foreign workers, firms with more than 20 employees are expected to hire at least 5% Saudis and foreigners cannot be hired for domestic work.

Saudi government has been proactive in embracing technology such as an e-goverment portal that makes it easy to access business licences and administration requirements (U.S.-Saudi Arabian Business Council 2012), which has led to higher productivity and efficiency

Saudi Arabia is well connected through the railways, airways, roadways and ports as shown in the pictures below.

Figure 3: Rail network in Saudi Arabia (Saudi Railways Organization, 2012)

Figure 4: Saudi Arabia airports (Al Zayer, 2010)

Figure 5:Saudi Arabia Road Network (Map Pictures, 2012)

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Figure 6: Major Ports in Saudi Arabia To Export (United National Export Company Ltd., 2012)

Saudi Arabia has improved its traffic control with 'Saher' that is an automated traffic system that has improved safety and control (Department of State United States of America, 2012). Men require driving licence for driving and women cannot travel alone need to be accompanied by someone while travelling.

2.5 Summary

This chapter has covered the background information on the history, geography, political structure and economy of Saudi Arabia to provide a framework on which the adoption and acceptance of mobile ticketing can be evaluated out of which demographics and technology acceptance would help us draw meaningful conclusions later in the research. The key features of Saudi Arabia are its oil-driven economy, dominance of Islam and Shariah law governing the citizens. The limited role of women in the economy and higher focus of government on education and technology development are other key features of the Saudi Arabian economy.

3 CHAPTER THREE: LITERATURE REVIEW

3.1 Introduction

The research is aimed at evaluating the acceptance of mobile ticketing services in the airline industry in Saudi Arabia. This chapter reviews the past literature related to the evolution and acceptance of innovative technologies such as mobile commerce, electronic commerce and electronic shopping etc. The chapter also reviews the theories related to the acceptance of innovative technologies and reviews the empirical research based on these theories. This chapter leads to the development of conceptual framework and hypotheses construction that is used in the research.

This chapter is divided into four sections and begins with a review of the evolution of e-commerce and mobile-commerce with specific focus on the literature related to ticketing process. The second section reviews the theories of technological innovation acceptance such as Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), Technology Acceptance Model (TAM) and its variations as well as Unified Theory of Acceptance and Use of Technology (UTAUT) to review the various factors that have been found to influence the innovative technology acceptance. The third section reviews the cultural evolution of Saudi Arabia and the airline industry in Saudi Arabia to identify the relevant research related to the acceptance of technological innovations in the country. The fourth section reviews the development of mobile ticketing platforms across the globe. The review is basically aimed at identifying the determinants of e-ticketing acceptance in Saudi Arabia and since it is related to human behaviour towards technology, it requires evaluation of the phenomenon from multiple perspective to include as many factors as possible in the conceptual framework.

3.2 A Brief History and the Evolution of E-Commerce and M-Commerce

The term electronic commerce or e-commerce has had different meanings over time. The original meaning of e-commerce referred to an electronic medium that facilitated business transactions as evident in the 1960s in the use of Electronic Data Interchange (EDI) to send and receive purchase orders and invoices between large businesses (Ariguzo, Mallach & White, 2006). With time, the meaning added the purchasing of goods and services over the internet to the original definition. To date, the term e-commerce encompasses a variety of business

functions including distributing, selling, buying, servicing and marketing of goods and services over an electronic media, predominantly the internet (Payman, R. et al. (2006). The evolution of the meaning of e-commerce mirrors the growing business functionalities e-commerce supports or has supported over time. However, the concept, the application and the growth of e-commerce is synonymous with the growth of the Internet and associated technologies, in that, historically advancements made on Internet technologies have had far-reaching effects on the e-commerce environment (Dignum, 2002).

E-commerce has had a short history, which dates back to the early 1960s. The concept of e-commerce was associated with the advent of the EDI that electronically transferred data from one computer to another. EDI enabled large businesses to send and receive purchase orders and invoices automatically without any form of human intervention (Ariguzo et al., 2006). All the while, this form of e-commerce focussed on facilitating and supporting business-to-business (B2B) transactions. However, in 1991, the development of the Hyper Text Transfer Protocol (HTTP) for internet communication that gave rise to the World Wide Web, coupled with the diffusion of personal computers, introduced the concept of Business-to-Consumer (B2C) to e-commerce (Ariguzo et al., 2006). In the late 1990s, the Internet witnessed the removal of the restrictions placed on its use for commercial purposes, the development of online payment systems such as Paypal.com, a user-friendly browser and an internet security protocol, the Secure Sockets Layer, which all together, occasioned an unprecedented growth of B2C e-commerce model (Mirescu & Maiorescu, 2011). To date, the two renowned e-commerce businesses, EBay and Amazon, emerged as the two most successful examples that began operations in mid 1990s (Payman et al., 2006). According to Golden et al. (2003), the initial success of e-commerce on B2C business stemmed from six sales benefits businesses accrued to e-commerce. These benefits included widening customer base, gaining a global presence, advertising to a wider market cost-effectively, providing efficient customer support services, gaining savings on cost and collecting customer feedback information.

The evolution of e-commerce has not always been smooth. The dot com bubble that exploded in 2001-2002 marked a critical time in the evolution of e-commerce causing the collapse of more than 60% of e-commerce businesses in the U.S. This may have caused other businesses to learn of the extant niche internet market, overcome the obstacles that caused the burst of the dot com bubble and revamped e-commerce as evident in the last two decades of burgeoning numbers of e-commerce business and transactions (Ariguzo et al., 2006). Although the global

growth of e-commerce since the dot com bubble burst has been exponential, the growth has not been universal. Mirescu and Maiorescu (2011), point out that while the evolution of technology facilitates the growth, diffusion rate and accessibility to e-commerce, the unequal resources and wealth distribution stalls the evolution of technology; thereby, effectively explaining why developing countries lag behind in the exposure, access and utilization of e-commerce. For instance, by 2005, North America and Western Europe already had well-established e-commerce (Ariguzo et al., 2006), yet six years later some developing countries, especially in the Middle East and Africa, still do not have well established e-commerce (Ariguzo et al., 2006).

As technology continues to develop, e-commerce similarly continues to evolve. Recently, the rampant diffusion and the widespread use of handheld devices as tools for accessing the internet has brought a high likelihood of more online shoppers doing it from the palm of their hands as they likewise chat on social networks. This arguably marked the emergence and growth of mobile commerce or m-commerce. Smartphone penetration in the Middle-East for instance is highest in Saudi Arabia at 79% and is growing at 11% a year (eMarketer Inc., 2015) and amongst the youth in the country Smartphone usage is at 73% and almost 10% of Smartphone users have used their phones for making purchases, which indicates a promising future for m-Commerce (Nielsen, 2014).

3.2.1   Mobile Commerce (M-Commerce)

The terms "electronic" and "mobile" that precede e-commerce and m-commerce respectively are important in distinguishing the two types of commerce. In this context, "electronic" may refer to "any time" access to business information and transactions implying access to telecommunication network is stationary and dependent on the geographical location of user. On the other hand, "mobile' refers to "anytime and anywhere" access to business information and transactions using wireless networks that are independent of the user's geographical location (Hohenberg & Rufera, 2004). This distinction points out that mobile commerce is not dependent on location of the user like the case in electronic commerce.

M-commerce runs on mobile or wireless platform. Mobile or hand held devices, are wireless devices that use a wireless network to communicate with one another and computer-mediated networks to access the services and functionality of telecommunication networks such as the

Internet (Tarasewich, Nickerson & Warkentin, 2002). Currently wireless devices include mobile phones, wireless handheld computers such as palmtops and tablets, and iPods. Other mobile devices, which may not be wireless but support m-commerce, include laptop computers and Personal Digital Assistants (PDAs). The interconnectivity between these mobile devices and computer-mediated networks enables both audio and audio-visual communication that facilitates and supports m-commerce.

Since m-commerce runs on the mobile wireless platform, m-commerce may be described as a form of business where transactions involving the transfer of ownership of goods or the right to consume services, which either businesses or consumers initiate and complete using mobile devices to interface computer-mediated communication networks (Jahanshahi et al., 2011). Turban et al. (2002) adds to this definition that m-commerce also includes a wide range of business transactions that occur before and after the actual process of buying and selling of goods and services electronically. These transactions may include customer relations services, product promotion, availing product information for customer comparison, after sales customer support, communication with logistics companies delivering product and other transaction unrelated services. The definition of m-commerce indicates it utilizes computer-mediated network to initiate and complete transactions, which makes m-commerce a subset of e-commerce that extends e-commerce functions and services to wireless handheld devices. As such, m-commerce includes all the functions of e-commerce that can be carried out on a wireless mobile device.

3.2.2 Theoretical Perspective on the Acceptance of M-Commerce

From the foregoing discussion, it is becoming evident that the characteristics, features, applications and benefits of m-commerce are indicative of its viability as a profitable alternative to e-commerce, and not just a mere extension of e-commerce. However, its acceptance is still not as widespread, or its growth is not as fast, as was the case with e-commerce (Jahanshahi et al., 2011). Several studies have variously theorized on the acceptance and rejection of m-commerce by individuals and organizations (Hung et al. 2004; Casey & Wilson-Evered, 2012; Yang, 2005; Qingfei et al., 2008). Siau et al. (2004) particularly noted that the fundamental features of ubiquity, localization, personalization and flexibility are the engines that drive m-commerce; however, usability and privacy issues have had a heavy bearing on its acceptance and use. With regard to usability, mobile devices display limited

content owing to the small sizes of their screens and have small keypads making data input quite difficult. With regard to privacy and security issues, since m-commerce authentication hugely relies on SIM and registered user's details, a stolen mobile device increases risk of misuse and fraudulent activities carried on the device without the owner's notice, more so in the case of the owner's failure to report the theft in good time (Jahanshahi et al., 2011). Thus, m-commerce can be said to be carrying higher risks than e-commerce for the users.

As in case of other innovative technologies, the acceptance of m-commerce can also be explained through technology innovation theories. Theoretical models of technology adoption and acceptance enable identification of factors that influence the adoption of innovative technologies by the users. Some of the related theories on the subject include diffusion of innovation theory Rogers (1962, in Rogers, 2010) , theory of reasoned action (Fishbein and Ajzen, 2005), theory of planned behaviour (Ajzen, 1991) and various other technology acceptance models (Venkatesh, V. et al., 2003). Each of the models have their limitations that led to the impr0oved models being recommended with Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, V. et al., 2003) being the most comprehensive one. However, each of them suggest some determinants of technology acceptance that might not be included in others and these have been discussed in the section below. However, even though these models have attempted at defining the determinants of the technology acceptance amongst users that can be applied to the acceptance of m-commerce amongst Saudi Arabian users, context remains an important determinant which can have varied interpretations and makes the models open to inclusion of other factors.

3.3   Theories of technology adoption

3.3.1   Diffusion of innovation theory

Amongst the first theories to explain the diffusion of an innovative technology came up as a result of an agricultural innovation adoption that led Rogers (1962, in Rogers, 2010) to model the factors that affected the adoption of innovative agricultural technology by the farmers. Rogers defined diffusion as a process through which an innovation is used over time by other members of the social system. The five major characteristics of the model were the relative advantage, compatibility, complexity, trialability and observability or the visibility of the results. These factors influence whether the new technology will get diffused amongst other

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members of the social system and Rogers (2010) also stated that the diffusion happens in stages during which the users gain confidence to use the technology. The following figure illustrates the stages of innovation-diffusion process as suggested by Rogers (2010).
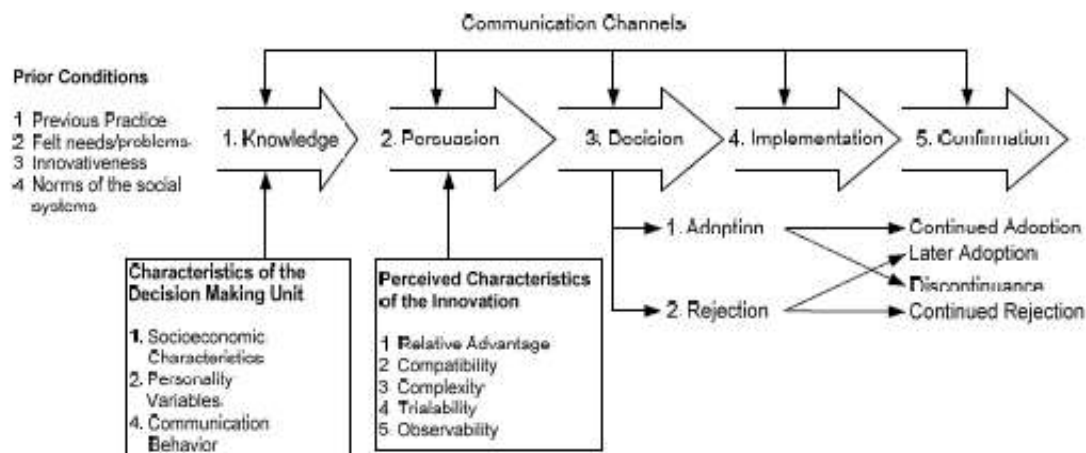
Figure 7: Stages in innovation diffusion process (Rogers, 2010)

As per this model, the users first acquire knowledge on the new technology, which is also influenced by their own perceptions regarding the new technology and then they look to others for further persuasion and this includes asking the innovators on their concern regarding the use of new technology. Based on all the information, individuals take a decision regarding the adoption of the new technology. This is followed by actual implementation of their decision and the confirmation that the technology has been successfully adopted by the individual.

This model has been adopted by various disciplines including information systems (Marez and Verleye, 2004) however the lack of reasoned arguments on why the technology was adopted limits its usage in situations where the reasons for adoption or rejection need to be highlighted and used for improvements (Venkatesh et al., 2003). The model however has been included in further researches on the subject as has been discussed in the below sections.

3.3.2   Theory of Reasoned Action

Fishbeing and Ajzen (2005) highlighted the importance of attitude of the individual in their adoption of innovative technologies. In their theory of reasoned action, Fishbein and Ajzen (2005) stated that the adoption of new technology can be determined through their behavioural

intention to adopt the technology and this intention in turn is moderated by their attitude towards this behaviour and other subjective norms such as the reaction of their social group on their behaviour. While attitude in this theory is defined as the positive or negative feelings associated with the target behaviour, subjective norms are their perceptions regarding the reaction of other individuals in their social group and thus forces them to think why the action should or should not be performed (Fishbein and Ajzen, 2005).
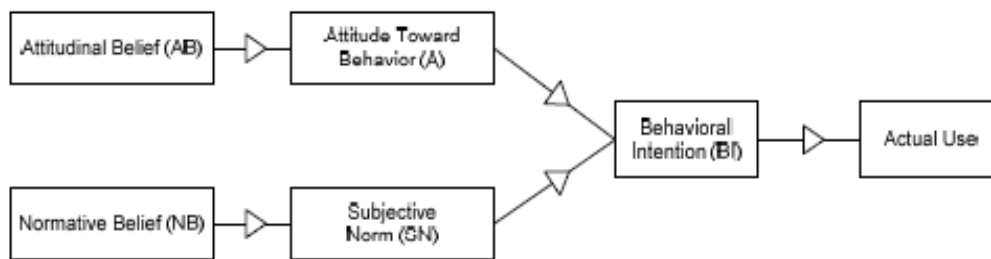
Figure 8: Theory of Reasoned Action (Fishbein and Ajzen, 2005)

Thus, Theory of Reasoned Action (TRA) identifies the attitude and subjective norms to be guiding the behavioural intention of users towards a new technology. While the attitude is indicative of the internal variables affecting individual choices, subjective norms incorporate the external variables that affect the behaviour of an individual (Davis et al., 1989). This theory thus was widely used to explain adoption of innovative technologies like the internal and other wireless technologies that have been responsible for the major changes faced in the last two decades (Mirescu and Maiorescu, 2011). This theory however has been extended into other theories such as Theory of Planned Behaviour (TPB) to overcome its limitation such as non-inclusion of behavioural control factors like the access to the resources needed to perform the desired behaviour. The other limitation of TRA is the impact of the attitude on the perceived subjective norms and vice versa (Ajzen, 1991). Thus, to overcome these limitations, Ajzen suggested TPB in which perceived behavioural control was added as an additional determinant of the behavioural intention towards a new technology.

3.3.3   Theory of Planned Behaviour

Theory of Planned Behaviour (TPB) also posits that behavioural intention is a determinant of the actual behaviour and the intention is in turn influences by the attitude and subjective norms driving the behaviour. Ajzen (1991) however also added perceived behavioural control

indicating that the individual is not the sole controller of the behavioural intention but is also dependent on the resources available to perform the behaviour. Thus, in additional to the attitudinal and normative beliefs, this theory also includes control beliefs as a determinant of the behavioural intention and actual usage of a technology.
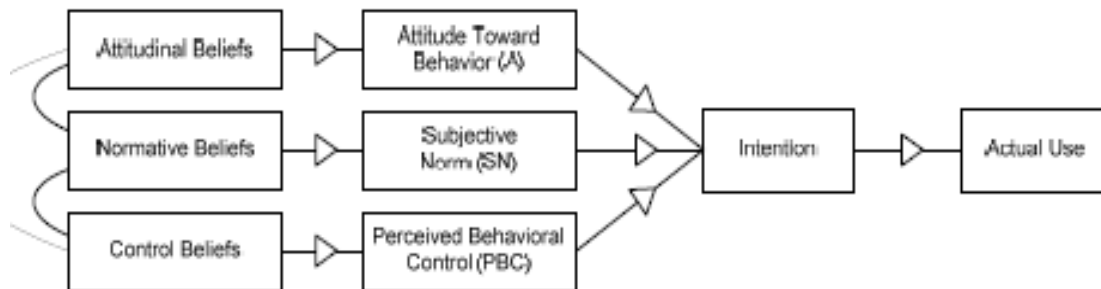
Figure 9: Theory of Planned Behaviour (Ajzen, 1991)

Based on the fundamentals of TRA and TPB, other technology adoption models such as Technology Acceptance Model (Davis 1989; Davis et al., 1989) and Unified Theory of Acceptance and Use of Technology (Venkatesh, V. et al., 2003) have risen to be the most influential and popular theories to explain technology acceptance. These have also been found to be valid in explaining individual acceptance or rejection of innovative technologies such as e-commerce and m-commerce (Jahanshahi et al., 2011).

3.3.4 Technology Acceptance Theory/Model

Technology Acceptance Model or TAM was developed by Davis et al. (1989) as a contract research from IBM to identify the factors that influence the acceptance or rejection of emerging technologies. While the earlier theories of innovation adoption focused on all innovations and innovative technologies, TAM was developed specifically to understand the adoption of information technologies by the users (Yang, 2005).

 Thus, while the initial studies focused on consumer behaviour (Gatignon & Robertson, 1985), information systems (Knol & Stroeken, 2001) and sociology (Wejnert, 2002), TAM was the first theory that focuses only on information technologies and has since then extended its application to the study on the adoption or rejection of e-commerce, and since m-commerce is

a subset of e-commerce, the model can likewise be applied to m-commerce (Mohammadi et al., 2011).

The design of TAM extends the Innovation Adoption Model by adding the actual use of technology on the intention to adopt the technology (Davis et al., 1989). The model is founded on five beliefs. (a) Perceived usefulness; (b) Perceived ease of use; (c) Attitude toward use; (d) Behavioural intention to use; and (e) Actual use.
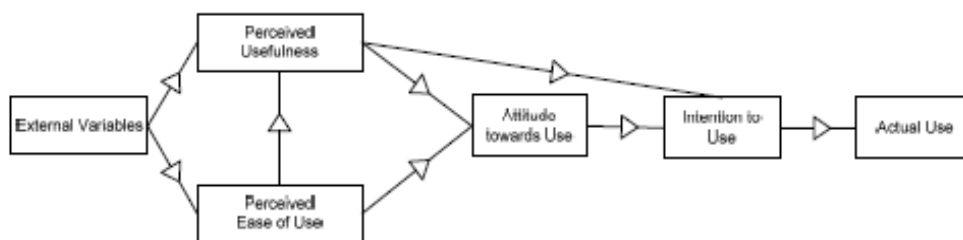
Source Davis et al. , 1989, p.985

Figure 10: The Technbology Acceptance Model (Davis et al., 1989)

In TAM, perceived usefulness (PU) refers to the extent users believe the use of technology will add value to their commercial processes and perceived ease of use (PEOU) refers to the extent users believe the use of technology will require minimal efforts in learning and using the technology. These two beliefs influence an individual's attitude and decision to adopt the technology. Behavioural intentions influence the intention to adopt as well as to use technology. TAM has been found to be helpful in identifying the acceptance and usage of innovative technologies (Malhotra and Galletta, 1999) and the importance of perception in the attitude and behaviour of the individual towards the technology explains the varied adoption patterns of innovative technologies (Suebsin and Gerdsri, 2009). However, researchers such as Hu et al. (1999) and Chau and Hu (2002) also found that PU is more important in determining the behavioural intention and PU also influences the PEOU of the individual towards the new technology.

TAM has also been employed to determine the acceptance of internet banking (Lai and Li, 2005) and when applied to determine the intention and actual usage across various demographic segments including gender, age and IT competencies, TAM was able to

accurately predict the technology adoption by a customer. However, the researchers highlighted the need for the technology adoption to be studied across respondent subgroups to identify approrpriate strategies to be used in promoting the technology adoption.

TAM has also been applied along with other information systems models such as Task Technology Fit Model (TTF) (Goodhue & Thompson 1995). TTF aligns the usage of information systems with the goals and outcomes and Goodhue and Thompson (1995) indicated that a higher fit will not only give higher performance but also lead to higher perceived usefulness of the technology. On this Klopping and McKinney (2004) also stated that in case of e-commerce, the user perception regarding the fitment of e-commerce in helping them achieve the goals of their task will determine its adoption. In this research, the researchers found strong evidence of the usefulness of technology affecting the actual use of technology in the context of the task being performed. Medhi et al. (2009) in their research on the impact of education on the perceived usefulness and ease of use of mobile technologies for instance found that basic education literacy brings a positive change in the acceptance and adoption of new mobile technologies.

Support for TAM has also been provided in the TAM innovation diffusion theory in which Zhang and Maruping (2008) included subjective factors such as relative advantage and image, objectives factors such as voluntariness, visibility and trialability and interacting factors such as compatibility and result demostrability to influence the PU and PEOU and thus the actual use by the individuals.

Kossek et al. (1994) and Al-Jabri and Al-Hadab (2008) based on their research on technology adoption also included expected capability and expected value offered by the technology to TAM. Under this, while the capability referred to the features of the technology that will improve the functionality for the users, the expected value referred to the net benefit offered by the technology over previous modes. Shih and Fang (2004) in his research on the use of internet in Taiwanese workplaces found that relevance of information needs determines the perceived usefulness, perceived ease of use as well as the attitude of the employees towards the use of internet.

Yang (2005) also suggests that TAM is a salient and useful model in studying consumer rejection or adoption of m-commerce and revised the model with the exclusion of the

behavioural intention to use and actual use beliefs in order to determine future adoption and use of m-commerce. This revised model assumes that consumers evaluate the belief of perceived usefulness (PU) and perceived ease of use (PEOU) of a new information system technology in their decision-making processes. As such, the study used Perceived Usefulness and Perceived Ease of Use as independent variables including demographic characteristics while Attitude towards use of technology was included as the dependent variable. The figure below schematically illustrates a revised TAM model applied to m-commerce as suggested by Yang (2005).
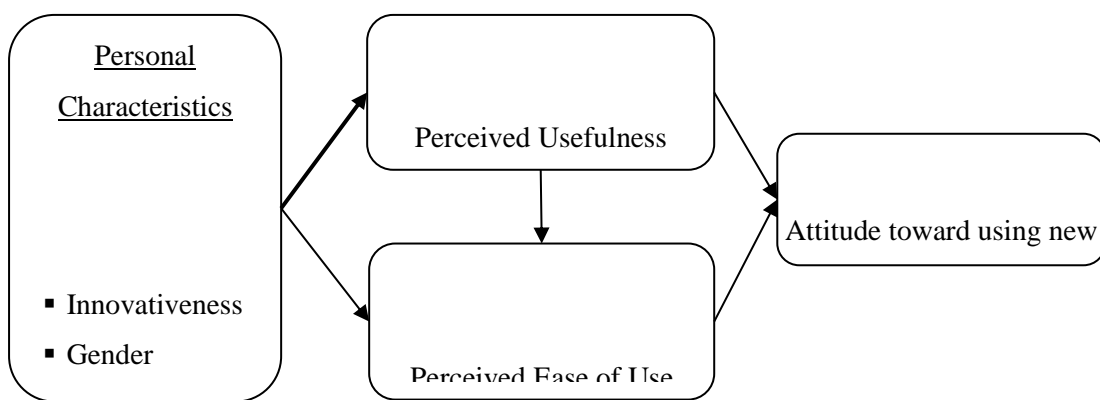
Figure 11: A revised TAM model (Yang, 2005, p262)

Yang (2005) points out that TAM is significant in studying the antecedents to individual adoption of emerging technologies. However, the lack of relationship between Perceived Ease of Use and the Attitude Towards Use, shows the relationship between these two beliefs are insignificant in studying emerging technology, which consumers have never used. Therefore, this observation implies that Perceived Usefulness is a significant belief in consumers' adoption of m-commerce. Contrastingly, Perceived Ease of Use is also significant in determining adoption and use of technology in post-usage experience (Venkatesh et al., 2003). Yang (2005) also found out that age and gender had effects on Perceived Usefulness; thus, influence the decision to adopt and use technology. With regard to gender, males were found to adopt new technology easily than females. Consumer innovativeness also had a positive influence on Perceived Usefulness and Perceived Ease of Use, such that, it is a powerful predictor in the adoption and use of technology. This factor is similar to the adopter categories defined by Rogers (2010) where he categorised the innovation adopters into five categories

dependent on their engagement with the technology during its life cycle. The following figure depicts the five technology adopters as innovators, early adopters, early majority, late majority and laggards.
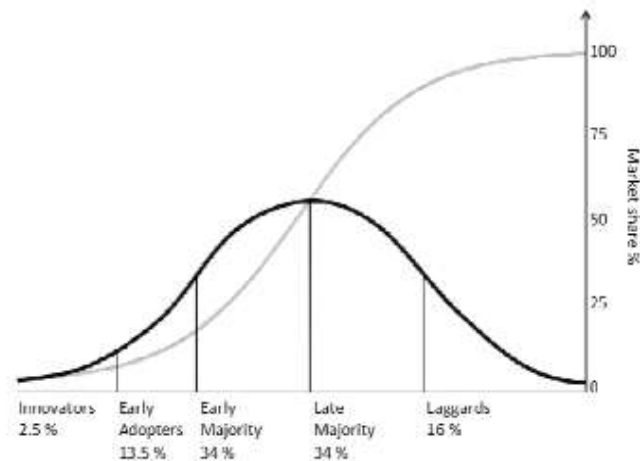
Figure 12: Technology adopter categories (Rogers, 2010, p.281)

Moreover, while demographics such as age and gender, and innovativeness may influence the decision to adopt new technology, factors such as legislations, information technology infrastructure, consumer privacy and data security also influence adoption and use of m-commerce (Yang, 2005). In a study similar to Yang (2005), Hung et al. (2004) also added the two beliefs of behavioural intention to use and the actual use of technology in relation to adoption of m-commerce. The findings indicated that both PU and PEOU had strong influence on the decision to adopt and to use m-commerce. In the findings, while PEOU positively influences PU, PU and PEOU all together positively influence the attitude towards using m-commerce. On the other hand, a positive attitude towards using m-commerce positively influences the behavioural intention (BI) that eventually influences the actual use of m-commerce. The findings from these two studies highlight the need for m-commerce businesses to influence the attitude and behaviour of users towards the technology and develop effective marketing strategies to appeal, attract and retain potential m-commerce consumers.

Thus, while TAM has been widely used by the researchers to predict the adoption and usage of technology, extensions and enhancements have happened to include additional determinants of the technology adoption. However TAM also could not explain the technology adoption in

Japan that is culturally different from the Western world (Straub et al., 1997) and Malhotra and Galletta (1999) argued that this has happened due to the missing factor for social presence in the model.

3.3.5   Technology Acceptance Model 2

TAM2 as an adaptation of TAM included the elements of social influence and cognitive instrumental process besides the original framework provided by TAM (Venkatesh and Davis, 2000). TAM2 included elements that affect the perceived usefulness as well as the behavioural intention of the users towards the new technology and thus provides a slightly detailed overview of the technology adoption process.
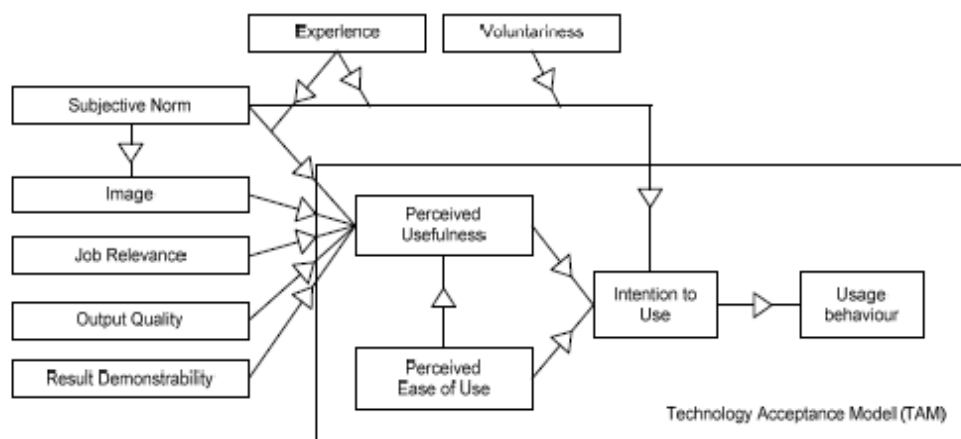
Figure 13: Technology Acceptance Model 2 (Venkatesh and Davis, 2000, p.188).

TAM2 has been validated by researchers in evaluating the technology adoption process and Gu et al. (2009) in their research found that subjective norms influence the image of the technology and thus its adoption. The researchers also found that job relevance and output quality have a significant impact on the perceived usefulness of the technology. TAM2 has been successfully used to evaluate the adoption of Web 2.0 websites (Wu et al., 2008).

Thus, various extensions of TAM have been developed by researchers to evaluate the technology adoption in varied contexts with the addition of variables that could better explain the adoption and use of innovative technologies. However, the latest technology adoption theory is the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003) and is a collection of the previous adoption theories such as Theory of

Reasoned Action (TRA) (Ajzen & Fishbein, 2005), Theory of Planned Behaviour (Akjzen & Madden, 1986), Technology Acceptance Model and Extended Technology Acceptance Model (Venkates & Davis, 2000). All these theories were based on TRA that theorized that behavioural intention predicts the behaviour of individuals. In the theory, behavioural intention is determined by behavioural attitude and subjective norms (social influences).

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

UTAUT is inspired largely from the TRA, however integrated the factors included in other technology adoption theories as well as some new factors that were not included in earlier theories. However, UTAUT has been suggested to be an improved version of TAM (Qingfei et al., 2008). Venkatesh et al. (2003) in their development of the UTAUT model studied the past prominent models of user acceptance of innovative technologies and then formulated one that unified their elements followed by the empirical validation of the unified model. The empirical validation studies happened across six organisations for their technology adoption and UTAUT was able to explain the varied acceptance of technology across organisations based on the elements included in the model (Venkatesh et al., 2003).

In the original UTAUT model, the variables that influence Behavioural Intention (BI) are performance expectancy, effort expectancy, social influence and facilitating conditions.
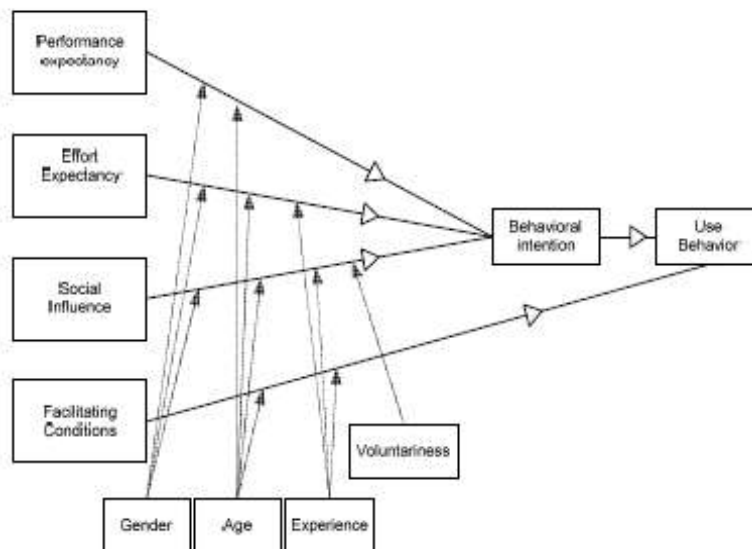
Figure 14: Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003, p.447)

Qingfei et al. (2008) developed a revised version of UTAUT to explain the m-commerce adoption. In this revised model, factors that influence BI include trust and privacy, utility expectancy, effort expectancy, social factors, and convenience and cost. The figure below shows the schematic presentation of the model.
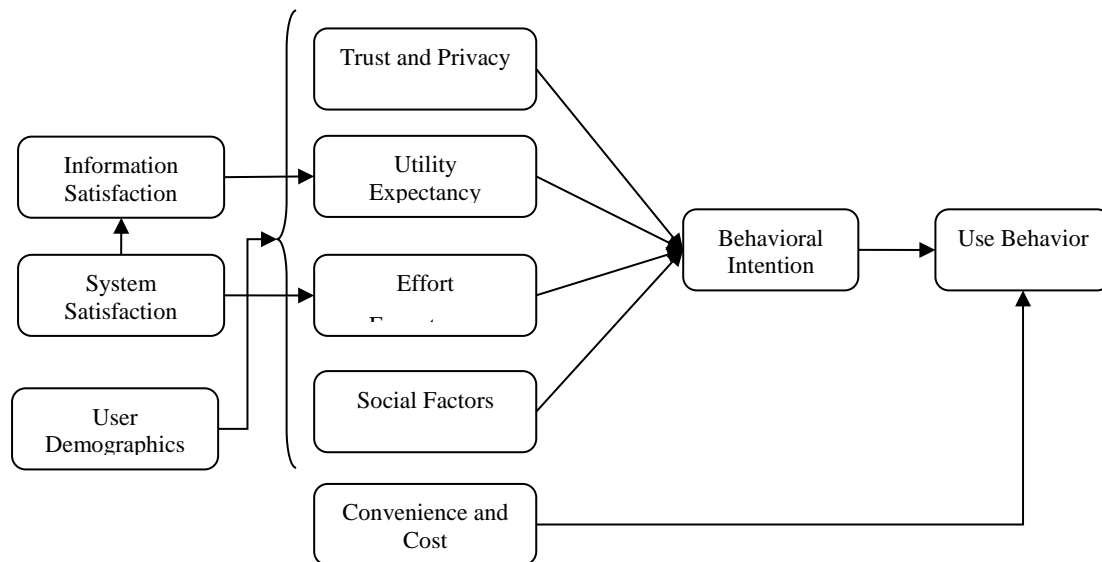
Figure 15: Revised UTAUT Model for M-Commerce (Qingfei et al., 2008, p.259)

The revised UTAUT model increasingly focuses on BI to adopt and to use m-commerce. Qingfei et al. (2008) in their research also found that users expect enjoyment from the use of m-commerce applications and thus utility also includes their enjoyment from the use of application. The researchers also did not include experience as a variable as in case of original UTAUT due to the voluntary use and personal nature of technology consumption, while UTAUT earlier was indicative of the technology adoption in the organisations.

Cost has also been found to be a significant factor for the adoption of m-commerce since wireless internet is more expensive than wired/cabled internet. On this Rao and Troshani (2007) indicate that cost is not just the user's perception of the higher costs of mobile internet but rather a user's perception of a mobile device in general and thus, has an inverse relation to the adoption of m-commerce.

In commerce, especially in non-store retail such as e-commerce and m-commerce, trust plays a central role in influencing consumer's positive attitude towards the decisions to make a purchase or a repeat purchase. In the Innovation Adoption Theory, perceived risk was an influencer of BI and in UTAUT perceived risk is similar to the trust variable. According to Siaua et al. (2004), trust in m-commerce entails the trust of technology as well as the firm behind the products or services. This implies that for a consumer to use m-commerce, the consumer has to trust both the technology and the service provider. In addition, since m-commerce is a new concept that lacks well-developed transaction standards, regulating policies and payment systems, trust becomes a vital variable for the consumer acceptance of m-commerce. Qingfei et al. (2008) emphasize that trust is also important while studying the usability and ease of use of technology and that trust of m-commerce provider is determined by their ability, integrity and benevolence. In this context, ability may also refer to a consumer's belief in the competency of the service provider; integrity to the service provider adhering to set principles and rules both preceding and succeeding purchases; and benevolence to the degree that the service provider is honest.

Riquelme and Rios (2010) in their research found that while the acceptance of new technology is driven by a positive attitude towards the technology, factors like social influence, trust, risk etc. also become important. Since m-commerce also provides location-based services and thus can track the location of the user, use of m-commerce application also raises concerns on privacy and trust on the service provider (Lu, Yao, & Yu, 2005). Lu et al. (2005) advise the m-commerce application providers to provide an option to the users on the tracking of their location information and thus enhance their trust in the service providers. They also highlight that government policies with regard to the privacy of the citizens also influence the behaviour of the users towards mobile applications.

UTAUT also includes demographics such as age and gender, similar to the revised TAM model as influencer of m-commerce adoption. This is because different users may have different attitudes towards acceptance and use of m-commerce (Qingfei et al., 2008). In Japan, for instance, rich, young and single women had the most positive attitude towards m-commerce while well-educated professionals in gneeral had moderate positive attitudes towards m-commerce (Rao & Troshani, 2007). Although gender and age are salient determining factor for a positive BI towards m-commerce use, other demographic factors like income, profession and marital status are equally influential, and should therefore be included (Mallat et al., 2006).

Additionally, mobile device features such as transmission speeds and compatibility with internet-based technologies are important to mobile users (Wu and Wang, 2005) and thus, their inclusion in studies of acceptance and use of m-commerce is of importance. Compatibility also refers to the compatibility of the mobile application usage with the lifestyle of the users and thus also has an element representing the infrastructure as well as experience available with the users to benefit from the use of the mobile applications (Park et al., 2007). Park et al. (2007) also found the use context to be important in the use of mobile applications since due to the mobility features associated with m-commerce, the users may be more open to use of mobile applications for their product or service needs.

Casey and Wilson-Evered (2012) in their research on use of m-commerce also found trust to be a salient influencing variable on the acceptance, adoption and use of m-commerce. While the study did not revisethe original determining features of the UTAUT model but added trust and innovativeness as influencers. The findings indicated that trust in technology, performance expectancy and effort expectancy, collectively may have a greater influence on the decision to adopt and use m-commerce. Observing that performance and effort expectancy are both vital for the acceptance and the use of m-commerce, Casey and Wilson-Evered (2012) support Yang's (2005) study findings on TAM that Perceived Usefulness and Perceived Ease of Use are also important in the acceptance and use of m-commerce. While Perceived Usefulness relates to performance expectancy, Perceived Ease of Use relates to Effort expectancy. Mallat et al. (2006) in their research on the use of mobile ticketing added the dimensions of use context and mobility to the list of factors influencing adoption of mobile ticketing technology and found them to be significant and strong determinant of the behavioural intention of the users.

This is the review of the information-technology adoption models, that were revised as needed to make them relevant to study the adoption of m-commerce, indicates that trust, cost, consumer demographics, ease of use and usability of mobile devices are the fundamental factors that influence a consumer's acceptance, adoption and use of m-commerce services. Zhou et al (2007) classified the factors affecting the use of innovative technologies into consumer and shopping factors where the consumer factors represent the demographics, personal traits as well as cultural and social influences, while the shopping factors included the shopping orientation, motivation, infrastructure as well as the perceived benefits and risks associated with the shopping.

Two of the factors from this research have been reviewed in the next section for their impact on the acceptance of mobile technology specifically in Saudi Arabia. These are the acceptance and adoption of the mobile technology globally and the cultural impact for acceptance of technology in Saudi Arabia.

3.4 Acceptance and adoption of mobile technology in the Developing World and Saudi Arabia

An upwards of three-quarters of the total world's population now have access to a mobile phone which brings the question of how the mobile phones are being used. The total number of mobile phone subscribers – both pre-paid and post-paid- has increased from less than one billion back in 2000 to more than six billion in 2014 and 80% of these come from the developing nations. Ownership of more than one phone is also becoming a common practice, strongly indicating that this number is likely to surpass that of the human population. According to a study by Information and Communications for Development in 2012, around thirty billion mobile applications were downloaded from the internet that year indicating the rising popularity of mobile internet use with the users (World Bank, 2012). Such applications help with navigation, act as tools for comparing prices and also become wallets. In developing nations, people have learnt to use the applications to seek new means of living and improve their way of life while the governments are also taking advantage of them to improve service delivery and receive feedback from citizens (World Bank, 2012). Countries in the third world are have also taken advantage of the potential that the growth and evolution of mobile technology presents to increase productivity in agriculture, health services, entrepreneurship and employment (World Bank, 2012).

Countries around the world, especially those that are developing are making very effective use of the opportunity. For instance, since the launch of mGovernment program in the Kerala state in India and the deployment of more than twenty applications, the interactions between the government and the citizens has surpassed three million since 2010 (World Bank, 2012). Another case is the launch of mobile payment system in Kenya, M-Pesa which has emerged as a prominent player in mobile payments. As a result, AkiraChix, which is based in Nairobi, has been able to network and train women in technology (World Bank, 2012).Souktel's JobMatch in Palestine has also helped young job seekers to find jobs and thus fresh graduates who have used the service have reported to have spent significantly less time looking for jobs, reducing the duration from twelve weeks to a week or less, and an upward trajectory in wages of more than 50 per cent.

Thus, mobile technology has been gainfully used by mobile users across the globe. Ownership is particularly high in Saudi Arabia, where there are over 190 mobile phones for every 100

citizens in the country. The United Nations reports that the country is leading in terms of the number of per capita mobile phone connections (World Bank, 2012). There has been a 200% increase in mobile phones usage in Saudi Arabia which is also the highest for any country and this tremendous increase in the number of subscribers in Saudi Arabia has put a lot of pressure on service providers to effectively meet the requirements of subscribers and may have affected their service levels (Alqahtani et al., 2014). With such great potential, Saudi Arabia is bound to become a major player in the telecommunication sector as clients in the region are always searching for new products (Communication and Information Technology Commission, 2015). The UN report also indicates that the number of teenagers and children actively using mobile phones is on a steady increase in Saudi Arabia. Despite its population of only twenty five million, most of whom are expatriates, the country came gtopped the list of mobile phone usage in the research (Communication and Information Technology Commission, 2015).

3.5 Cultural impact on use of technology

Adoption of technology is influenced by the socio-economic environment prevailing in a country and this makes it important to understand the cultural influences (Shareef et al., 2009). Png et al. (2001) even suggest that the technological infrastructure development is also dependent on the culture since it is the citizens who are the ultimate users of the technology. Kurnia (2007) stated that the developed world offers both tangible and intangible infrastructure required by the innovative technologies to succeed and thus have higher adoption rates. Burhanuddin et al (2009) on the role of shopping in a society highlighted that in some countries shopping is a social activity and this can be a deterrent to the adoption of e-commerce that does not require visits to physical shopping spaces.

Geertz (1973, in Hofstede, 2001) defines culture as the "historically transmitted pattern of meanings embodied in symbols, a system in inherited conceptions expressed in symbolic forms by means of which individuals communicate, perpetuate, and develop their knowledge about and attitudes toward life" (p.89). Hofstede (2001) also defines culture as the "collective programming of mind" that distinguishes one culture from another. Hofstede (2001) in his cross-cultural research across more than 70 countries has mapped the countries on five cultural dimensions power distance, individualism, masculinity, uncertainty avoidance and long-term orientation (Hofstede, 2001). The relevance of these cultural dimensions to technology adoption and implementation has been researched over the last several decades (Al-Gahtani,

Hubona & Wang 2007; Silvius 2008). Silvius (2008) for instance mapped the business-IT alignment of countries with the cultural dimensions and concluded that social interaction specifically plays an important role in the acceptance and implementation of technology adoptions in a country. Al-Gahtani et al. (2007), on the other hand compared the acceptance of innovative technologies by the users across developing and developed countries and found strong influence of social and cognitive factors on user perceptions and behavioural intention towards the new technology. Chen and Tan (2004) for instance found that individualism promoted the use of computing technologies. Png et al. (2001) also found national culture to have significant influence on technology adoption and Tredinnick (2008) even expressed that adoption of innovative computing technologies also leads to transformation in social and cultural practices.

The cultural dimensions proposed by Hofstede and their relevance to research on technology adoption have been challenged by Myers and Tan (2002) since the research happened in 1970s and involved largely corporate executives, while these researchers suggest culture to be "contested, temporal and emergent". However, the role of social practices and personal attributes has been proven by researchers (Lin, 2011; Myers and Tan, 2002) and Lin (2011) also argued that innovative technologies cannot be adopted without the impact of individual's personality on their adoption and actual usage.

Hofstede's (2001) cultural dimensions can also be evaluated to develop an understanding of the Saudi Arabian society. The chart below indicates that the Saudi Arabian society is high on power distance, is collectivist, masculine as well as high on uncertainty avoidance. High uncertainty avoidance indicates slow adoption of new technologies especially if they are perceived to be risky (Tredinnick, 2008). However, while Saudi Arabia is high on collectivism, Myers and Tan (2002) found individualism to promote acceptance of innovative technologies and through this explained higher adoption of innovative technologies in the US and UK. However, on the other hand, masculine cultures have been linked to higher acceptance of technology (Lin, 2011) and based on this technology acceptance in Saudi should be higher. However, at the same time prevalence of strong socio-cultural influence and collectivism is expected to lead to slow adoption of innovative technologies based on the experiences of others in their social groups (Silvius, 2008).
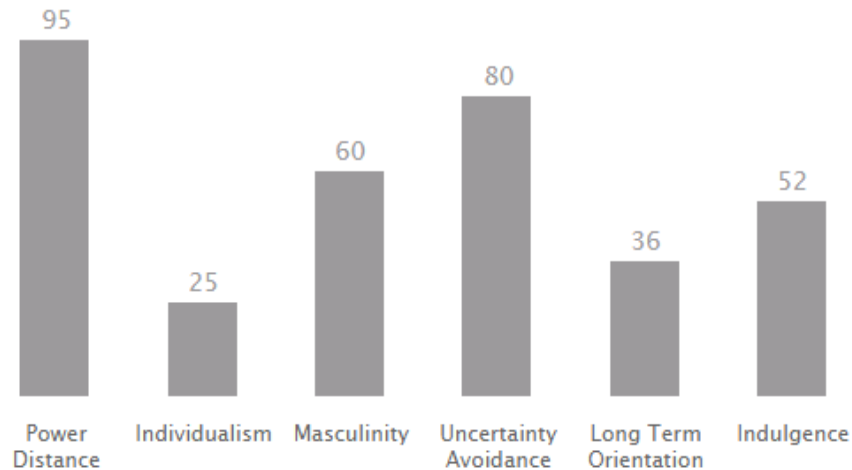
Figure 16: Hostede's cultural dimensions for Saudi Arabia (The Hofstede Centre, 2015)

3.6 E-Ticketing and M-Commerce

E-ticketing refers to the processes that are utilised to issue electronic tickets to the customers and involve electronic payments and is arguably the most daunting and tasking services on an e-commerce or m-commerce platform (Burmistrov, 2009). The involvement of complex databases and searches involved in the issue of tickets require highly reliable infrastructure to carry out the transactions and the need for high quality internet can make it challenging to use this ticketing mode (Cheng & Huang, 2013).

The Massachusetts Bay Transportation Authority (MBTA) was the first transit agency to sell tickets via the smart phone back in November 2012. The agency later made a milestone by letting its customers buy single, 10 trip and single month tickets to its customer via a new smart phone application. This idea has since expanded to include buses and transportation systems and also other cities.

The use of mobile tickets is steadily on the increase with more users taking up service. It is predicted that the total ticketing transactions would reach 32 billion by 2019 (Juniper research, 2016). The major players are network operators, who have increased their presence in the commercial services. Some of the major ticket issuers starting to use the mobile ticketing technology are Ticketmaster,Tickets.com and British carrier British Airways (Long, 2005). There are various means for purchasing the mobile tickets including the use on the internet, through text messaging services, via voice call over the a mobile handset, or making use of

available mobile applications. Mobile applications and text messaging offer convenience in cases where purchases are made either on a daily basis or frequently. One of the greatest drawbacks of using text massaging is the fact that the vendor loses revenue to the mobile operator and purchases with a credit card have to be made over the internet since text messaging is not sure enough to allow credit card entries.

Mobile applications while have been used as a means of information to air travellers, these have not been used for ticket bookings, largely due to the complex process and need for highly reliable infrastructure (Burmistrov, 2009). However, Koenig-Lewis et al (2010) and Pikkarainen et al. (2004) in their research on the adoption of mobile and online banking respectively could not find a significant relation between system complexity and intention of the users. Moreover, triability of mobile ticketing due to non-existent installation costs to use the application have been found to be positive influencers of its adoption by the users (Kapoor et al., 2013; Meuter et al., 2005).

Another consideration for the use of m-ticketing is mobile usability (ease of use and usefulness). Usability is one of the main reasons that have impeded the growth of m-ticketing. The usability of mobile devices is hugely impacted by the small size of its display screen, making carrying out transactions and interactions increasingly difficult. Other limiting features include the small-sized keypad that makes data input difficult and error-prone, very slow download speeds regardless of the 3G network and most websites have not be optimized for mobile device access. Mohammadi et al. (2011) note that even with these limiting features, mobile applications for e-ticketing can utilize client side processing and location –based to achieve better performance and user satisfaction than e-ticketing (using e-commerce). Moreover, m-ticketing has the potential to offer a rich user experience that will have an impact on perceived usefulness, perceived ease of use and playfulness, which collectively may positively influence user's behavioural intention towards adopting m-ticketing (Mohammadi et al., 2011). Alqahtani et al. (2014) in their research on the lack of adoption of m-commerce in the Saudi Arabia even though the country remains the highest user of mobile services found the key influencers to be ease of use, navigational structure, visual appeal, usefulness, ICT infrastructure, security, trust, culture, cost, government m-readiness, and social influence. Mallat et al. (2006) further highlighted the importance of contextual factors in the acceptance of mobile technology and found that users are more likely to use mobile-ticketing services when no other means are available. Yang et al (2012) found that use context not only explains

the mediated effect of utilitarian value on the mobile adoption but also hedonic value and thus highlighted the need for including enjoyment and concentration factors in modelling the mobile adoption. The moderating effect of use context in the mobile ticketing adoption can also been seen in the results of the research by Yang et al. (2013) who found that enjoyment was not a determinant of the mobile ticket adoption by tourists visiting China and they were only concerned with the utility value of the application.

Existing mobile applications for e-ticketing may be useful to provide an insight into the use of m-ticketing. However, the first m-ticketing applications were WAP based bookings that were merely a replica of the online ticketing application made for mobile devices. These applications belonged to a few airline companies; thus, were not globally used. Building an m-ticketing application that leverages on the online e-ticketing system is much easier as well as easier to market (Cheng & Huang, 2013). By mobile device acting like an agent of the online e-ticketing system, it will reduce amount of text input, reduced sending personal details since they will be available from credit card payment, and a mobile device user can make flight changes or cancellation easily on the mobile device, which the e-ticketing website will reflect (Yang et al., 2012).

In Malaysia, where a majority of air travellers are leisure travellers, Mohammadi et al. (2011), indicates that a majority of travellers booked flight at airlines agents' offices. The reasons or indifferent attitude towards e-ticketing, and by extension m-ticketing, included fear of fraudulent activities on their credit cards and lack of sufficient security for their personal information. On the other hand, the Malaysian travellers who booked online (e-ticketing) stated they opt for e-ticketing because of ease of reservation and payment, ease of choosing flight time and carrier, accuracy of information, eliminates inconvenience of carrying papers and trip documents that are stored on a mobile device. While some travellers with no prior experience in e-ticketing booked online just to test it as a viable alternative to physical booking, some were confidence about the conventional physical booking and did not want to expose themselves to the risks associated with e-ticketing. One of the most advantages for using mobile ticketing is the convenience it offers. It is a lot easier to use a WAP-enabled handset to purchase the tickets, store them in the phone and use it at the point of entry by swapping. This eliminates waiting time in queues. Schierz et al. (2010) in their research on adoption of mobile payment services found positive and significant influence of mobility on the perceived usefulness and intention of the users. Importance of mobility feature to the adoption of mobile applications has also

been highlighted by Ngai and Gunasekaran (2007) who stressed on the unique benefit offered by mobile devices. Mallat et al. (2006) in their research on the adoption of mobile e-ticketing services found mobility to have a stronger influence on the behavioural intention to use the technology than even the perceived usefulness, which highlights the unique benefits that are offered by the use of mobile technology.

Lau et al. (2011) studied the effects of quality of e-service and customer satisfaction on airline e-ticketing to gauge consumers' behavioural intention to adopt m-ticketing. The findings indicated that to enhance e-service and customer satisfaction, there is a need for airline companies to design websites that is easy to use and relevant content (usefulness and usability). Website usability was particularly important to experienced and new customers, since information provided also influences a customer purchase decision. Additionally, websites should have interactive features where customers are able to post comments and feedbacks. The risks associated with the failure of mobile payments has also been found to have a negative impact on the intention of the users (Chen & Chang, 2013). Cheng and Huang (2013) in their research on the adoption of mobile ticketing services found innovativeness of the user to have a significant influence on the adoption of mobile services by the travellers. The researchers also highlighted the importance of perceived usefulness as well as perceived risk in mobile adoption. Another important factor to gain customer satisfaction is assurance. Here assurance means enhancing security and credibility and providing information about their security measures on their websites for customer to understand their seriousness about security and reduce customer anxiety about security. In overall, Lau et al. (2011) pointed out that customer satisfaction is related to purchase intention. A satisfied customer is likely to purchase an e-ticket. In addition, customer satisfaction is influenced by ease of use of a website, website design, assurance, personalized websites and responsiveness. Airlines must recognize all these factors if they intend to be successful in e-ticketing and m-ticketing. A lot of stringent security measures have been taken to reduce and curb frauds and theft of these tickets. The ticket sent a handset are usually made unique to that particular handset and as such, it is impossible to resend it to another phone. Further measures have been taken to include the customer's picture and name for immediate confirmation in cases where issues of security arise. Lost or accidentally deleted mobile tickets can also easily replaceable by the vendor or canceled altogether (Dahlberg et al., 2008).

The use of mobile tickets reduces the costs associated with the production and distribution. In addition, they improve customer convenience by making it simple and convenient to buy the tickets. Mobile tickets have the ability to be applied at the same points which previously sold out regular tickets (Reynolds, 2004). Cost has been found to be a key determinant of the adoption of 3G services by the mobile users (Pagani, 2004) and Kleijnen et. al. (Kleijnen et al., 2007) also found perceived cost to be influencing the adoption of mobile banking services. Cost can be the collective cost of owning the device, data usage cost, maintenance cost and the upgrade cost needed to successfully use the mobile application (Luarn & Lin, 2005). Cost was found to be a key barrier to the adoption of m-commerce in Malaysia (Tsu Wei et al., 2009) and cost has also been found to be a significant negative impact on the behavioural intention of mobile users (Chong et al., 2012). Since the cost of mobile communication remains high across the globe and especially the faster data speeds are associated with even higher costs, complicated mobile applications are expected to have slower adoption than those that consumer less data (Tojib & Tsarenko, 2012).

Based on the above discussions, we can highlight that a) cost of the Smartphone, availability of the Internet including costs. b) Trust of consumers in technology being safe so as to avoid fraudulent use of credit cards. c) Usefulness of m-tickets vs e-tickets and the ease of use for booking and retrieving tickets via mobile phones.

3.7 Research framework

1. From the discussion in 3.3 theoretical approaches, we have identified set of factors likely to be of value in investigating the acceptance of m-ticketing in KSA and have indentified linkages between them.

2. The network below represents the linkage between the various dependent and independent variables to be investigated in research and also becomes the basis for the research hypothesis.

3. This network is an amalgamation of the TAM and UTAUT that have been used as a framework for the current research.

4.The below diagram is influenced mostly from Venkatesh's work and includes theories which have had an influence on TAM and UTAUT
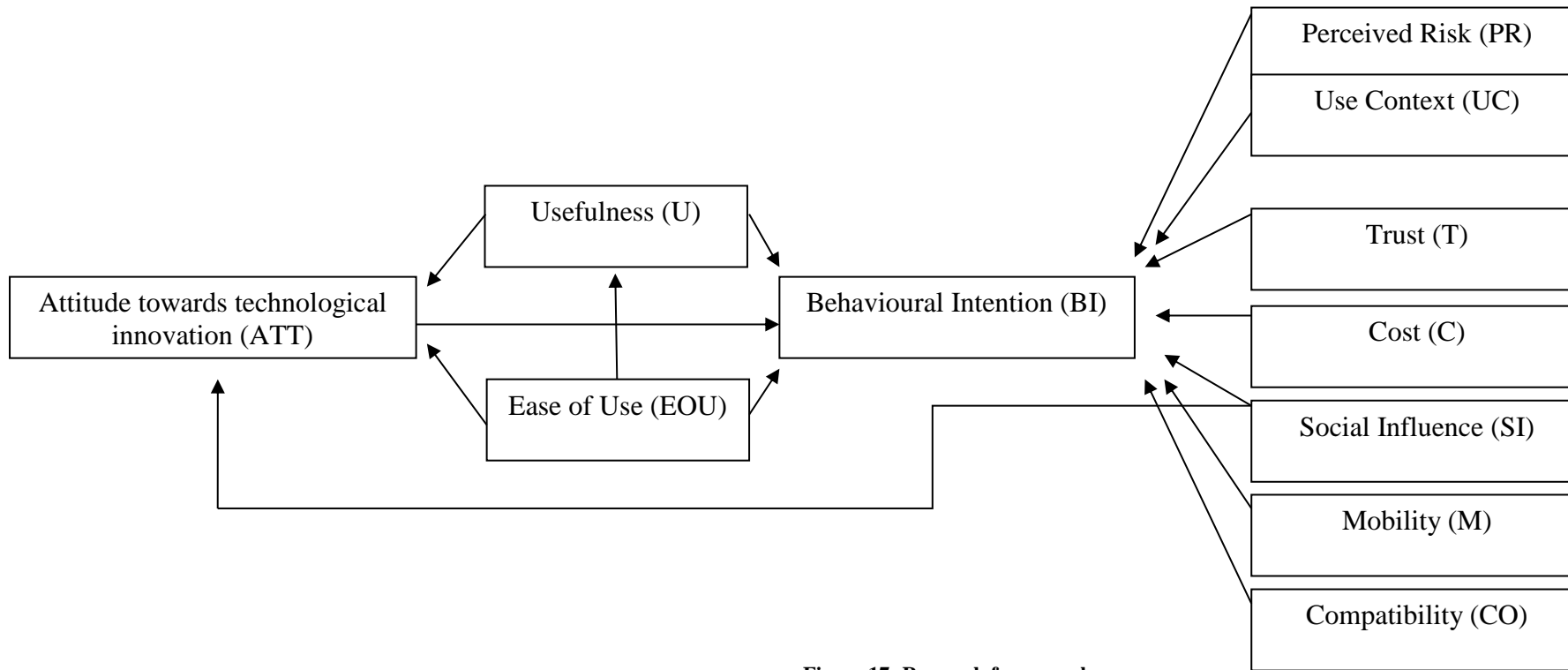
Figure 17: Research framework

3.8 Hypotheses for the research

The data analysis for the quantitative research will be aiming to test these linkages through the various hypotheses based on the two technology acceptance models. Based on previous figure 17, we are creating the variables for the tests to be conducted based on how they influence each other.

H1.1: Perceived usefulness of the mobile ticketing services influences the attitude of the consumer towards the technology (U-ATT)

H1.2: Perceived ease of use of mobile ticketing services influences the attitude of the consumer towards the technology (EOU-ATT)

H1.3: Perceived ease of use of mobile ticketing services influences the perceived usefulness of the technology (EOU-U)

H1.4: Perceived social influence of mobile ticketing services influences the attitude of the consumer towards the technology (SI-ATT)

H2.1: Perceived ease of use of mobile ticketing services influences the behavioural intention towards the technology (EOU-BI)

H2.2: Perceived usefulness of the mobile ticketing services influences the behavioural intention of the consumer towards the technology (U-BI)

H2.3: Perceived risk of the mobile ticketing services influences the behavioural intention of the consumer towards the technology (PR-BI)

H2.4: Perceived user context of the mobile ticketing services influences the behavioural intention of the consumer towards the technology (UC-BI)

H2.5: Perceived trust of the mobile ticketing services influences the behavioural intention of the consumer towards the technology (T-BI)

H2.6: Perceived compatibility of the mobile ticketing services with other mobile technologies influences the behavioural intention of the consumer towards the technology (C-BI)

H2.7: Perceived social influence of the mobile ticketing services influences the behavioural intention of the consumer towards the technology (SI-BI)

H2.8: Perceived mobility of the mobile ticketing services influences the behavioural intention of the consumer towards the technology (M-BI)

H2.9: Perceived cost of the mobile ticketing services influences the behavioural intention of the consumer towards the technology (Co-BI)

H3: The attitude of the consumer towards the use of mobile commerce for E-ticketing influences the behavioural intention of the users (ATT-BI)

3.9   Chapter Summary

 This chapter reviewed the past literature on the use of e-commerce as well as m-commerce and highlighted the factors that have been found to influence the adoption of mobile technologies and m-commerce. The chapter highlighted the technology adoption theories such as TRA, TPB, TAM and UTAUT which help identify the determinants of adoption and use of innovative technologies that have also been studied in various empirical researches in different context. Finally, the empirical researches focused on e-ticketing and mobile-ticketing were reviewed to identify factors that have been found to influence the acceptance of m-ticketing.

From this we identified the following as consumers to be investigated – trust, cost etc. The chapter also discussed the importance of culture and thus reviewed the culture of Saudi Arabia and reviewed the mobile adoption in the country. In the next chapter we explain how these topics were investigated in detail.

4 CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

This chapter will begin to discuss the research framework and perspective that has been utilized in designing the methodology and in conducting the procedures that the research requires. Based on the literature discussed in the preceding chapter a conceptual model was formed, this was used to formulate the research design that has been adopted in the entire procedure of the research. While the conceptual model has already been discussed in the previous chapter, the research design will be presented in this chapter. The sections below also describe the choices available to the researcher in designing the research and the rationale behind the selection of the chosen methodology. The research has been designed based on the research onion suggested by Saunders et al (2009) where the authors have provided a systematic mechanism through which the research can be designed to include all the elements of research design in a matter that also aligns the research choices.

The research has been carried out with the objective of understanding the acceptance of mobile-ticketing amongst the airline travellers in Saudi Arabia and through this identify factors that need to be considered by the airlines and other associated support services providers in designing their marketing and internal processes to improve the acceptance of mobile ticketing services amongst Saudi Arabian airline travellers. The research will be designed as a quantitative and qualitative research to enable the researcher to utilize the existing theoretical frameworks in carrying out a consumer research in a structured manner and at the same time enable an in-depth enquiry into understanding the factors that influence the acceptance of mobile ticketing services in Saudi Arabia.

There are two parts of this section and while the first part focuses on the research philosophy, approach and strategies considered to be most suitable in addressing the research questions, the second part focuses on the techniques and procedures that would be used for collection of research data and further analysis. The second section will discuss the sampling techniques and data collection instruments in detail to describe the population and sample from where the data will be collected as well as discuss the format of the data collection instruments to create a framework for the information being collected from the research participants. This will be followed by the section that assesses the reliability and validity of the instruments and

procedures used in collecting the data. Finally, the ethical considerations of the research method employed in this research will be enumerated and discussed. All the details of the methods chapter will be summarized in the final subsection of this chapter.

4.2   Research paradigm

Research paradigm or the philosophical frame that will be used to conduct the research establishes the assumptions undertaken by the researcher in terms of the source and nature of knowledge that will be used to evaluate the research phenomenon (Collis & Hussey, 2009). Research paradigms provide the framework on which the data needed for the research can be defined and structured (Hussey & Hussey, 1997). The two main paradigms available to the researcher are the paradigms of positivism and interpretivism (Byrne et al., 2008). These two are contrasting paradigms and while positivism has been adopted from natural sciences, interpretivism is based on the belief that social world is complicated and cannot be understood merely by adopting principles from natural sciences (Collins and Hussey, 2009).

Thus, researches designed on the philosophy of positivism are highly structured to enable the researcher to examine the social patterns and associations in detail through the use of scientific analysis. On the other hand, researches designed on the philosophy of interpretivism do not rely entirely on the statistical tools available to examine the research phenomenon but instead focus on deeper interpretations for the actions of people, which requires an unstructured approach to carry out a detailed investigation based on the research phenomenon being evaluated (Blaikie, 2007).

The research however will use both the philosophies since positivism can be used for quantitative structured enquiry while interpretivism can be applied to the detailed investigation through qualitative research. This thus will help overcome the limitations of the structured research through scientific means that requires the variables to be quantified and thus can limit detailed investigation, but at the same time enable objective assessment of the research phenomenon based on the quantitative research. Adoption of both the philosophies in a research has been highlighted by Creswell (2003) as a pragmatic way to approach the research problem. Thus, positivism and phenomenology representing objective and subjective reality will be used in the research and while positivism does not require active involvement of

researcher in the research environment (Mangan et al., 2004), interpretivism requires researcher to be an integral part of the research (Kent, 1993).

Under interpretivism, there are two philosophies that can be adopted by a researcher, symbolic interaction and hermeneutics phenomenology. However while symbolic interaction focuses on observations as a means to understand a phenomenon through symbols and meanings, phenomenology focuses on the reasons behind the phenomenon by analyzing the past experience of the individuals with the research phenomenon being studied (Bryman, 2012). This study uses the phenomenological approach to explore the issues affecting the acceptance of mobile ticketing services in Saudi Arabia. A major reason for the preference of the phenomenological approach is its strength in addressing a research phenomenon from the primary perspectives including first-hand information of people affected or related to the phenomenon (Easterby-Smith. et al., 1991). Unlike other approaches, the phenomenological approach helps in analyzing the related issue within the natural settings, therefore, making the analysis more true and reliable (Walliman, 2005). In the research, perceptions of individuals regarding the acceptance of mobile ticketing in Saudi Arabia will be sought by addressing the issue from the people involved and developing their level of acceptance of the new technology in Saudi Arabia. As Kruger (1988) stated,

"*The phenomenologist's are concerned with understanding social and psychological phenomena fromthe perspectives of people involved*" (p. 189)

The research will thus be based on twin philosophies of positivism and phenomenology where both objective and subjective assessments will be carried out to evaluate the acceptance of mobile ticketing services in Saudi Arabia.

4.3   Research approach

In order to come up with ideas and constructs regarding the issues about the acceptance of m-commerce in Saudi Arabia, and to find out which factors might have an effect on the people's acceptance of this technology, the appropriate research approach, design and method should be used (Saunders et al., 2009). The research can be carried out with a deductive or inductive approach with the key difference being in terms of the reliance on the existing theory to reach the conclusions (Creswell, 2003).

Deductive approach requires the research to formulate hypotheses based on existing theoretical frameworks and tests them through the data collected during the research (Saunders et al, 2009). This approach is highly scientific and the parameters of the research and the scope of the analysis are set at the start of the research, which might be disadvantageous since the researcher has no freedom to explore other possibilities and issues that might arise during the course of the data gathering and analysis that are not included in the previously set scope ((Anderson & Huesmann, 2003; Saunders et al., 2009) However at the same time deductive approach due to its inclusion of existing theoretical frameworks can provide the framework that can be used to collect structured data that is required for researches based on positivism.

Inductive approach on the other hand provides higher freedom to the researcher, since there is more flexibility in the scope of the research that could be modified as the research progresses, as more new information is gathered (Saunders et al, 2009). This approach is suitable for the philosophy of interpretivism, since the ideas and constructs that were not initially in focus could be added to the research's scope, thus the findings could be more in-depth and larger. Moreover, inductive research often leads to creation of theoretical frameworks based on the research findings (Saunders et al., 2009).

Mobile ticketing is not a highly researched subject, which provides limited support in the use of theoretical frameworks for the existing research, thus indicating inductive approach to be better able to achieve the research objectives. However, being an innovative technology, technology adoption models can be used to identify some of the factors that might be influencing the acceptance or rejection of mobile ticketing in Saudi Arabia. Thus, the research can be carried out with a deductive approach using the existing theoretical frameworks but at the same time use inductive approach to identify factors that might not be included in the existing theoretical frameworks but influencing the adoption of mobile ticketing services in Saudi Arabia. The inductive approach will also serve as an important strategy to knowledge development in a field where there are huge gaps leading to a wider scope in the review and analysis of the highlighted phenomenon. Thus, the research will use a mixed approach to evaluate the research phenomenon.

4.4 Research design

The earlier sections included discussion on the philosophy and approach to be used in carrying out the research and highlighted the choices as positivism, phenomenology and deductive and inductive approach. As indicated in the introduction to this chapter, the research will be designed as a mixed method research and will use both qualitative and quantitative research to address the research questions (Creswell, 2003; Johnson & Christensen, 2010). The construct of m-commerce user acceptance is still new with regards to the Saudi Arabian context, especially in the case of mobile-ticketing, and it needs to be explored in detail. There is limited research available on the potential user acceptance of m-commerce in Saudi Arabia, and by employing a qualitative design, this study could focus on a more detailed and in-depth exploration of the thoughts, opinions and preferences of the people of Saudi Arabia, including the rational for why these people think in a particular way towards m-commerce (Creswell, 2003). This research method would fit the research objective that aims to explore the perspective of the potential users of m-commerce as to the extent of their acceptance of the service technology that are not discussed in the literature.

On the other hand, quantitative research focuses on measuring the parameters of a particular phenomenon, and objectively interpreting quantifiable data through the use of statistical testing methods in order to provide clarity about what is previously known from past research (Collis & Hussey, 2009). This research design gives an accurate scale for people's opinions, preferences and behaviour and employs scientific techniques to come up with an outcome that could address the study's hypothesis about relationships of factors (Saunders et al., 2009). By employing this type of research method, an objective and systematic investigation of the factors that may have an influence on m-commerce acceptance among the people of Saudi Arabia, could be achieved. The result of the statistical testing would provide an understanding of associative, causal and predictive relationships between the variables being studied.

Lastly, the mixed method design combines both qualitative and quantitative research in order to broaden the scope of the research, while also providing support to the findings from both types of research (Creswell, 2003; Johnson et al., 2007; Johnson & Christensen, 2010). Thus, while the quantitative research findings will enable generalisation through statistical tests, qualitative design will help explore the phenomenon in details without the boundaries of the existing theoretical frameworks (Johnson & Onwuegbuzie, 2004). Thus, the mixed methods

approach will help overcome the limitations of the two types of researches (Saunders et al., 2009). Oates (2005) has emphasised on the use of diverse data in the research process as a means to achieve higher levels of reliability in analyzing a phenomenon. Mixed-methods approach also helps in triangulating the research since the data collected through varied means can be verified for their credibility and thus providing an alternative to the validity and reliability testing done for the research (Denzin, 2006). Therefore, mixed methods will be preferred with a focus of collecting both quantitative and qualitative data.

4.5   Research strategy

Business research could employ exploratory or conclusive strategies (Malhotra, 2004) depending on the research objectives. Since the current research aims at the identification of the reasons for the acceptance or rejection of mobile ticketing services in Saudi Arabia, the research requires a conclusive or explanatory strategy. However, since the research subject of mobile ticketing is relatively new, there is also the necessity for the researcher to expand the available theoretical information about the research topic which in this case is the user acceptance of m-commerce, before the more specific and detailed research questions could be addressed. In order to achieve this, the exploratory research will be done wherein the researcher could develop the knowledge about the subject in the context of Saudi Arabia (Malhotra, 2004). For the researcher to further and deepen the insight and meaning to the already available knowledge and theories on the subject matter (Saunders et al., 2009), the exploratory part of the study has also been done through review of related literature. However, exploratory research in the context of Saudi Arabian mobile-ticketing acceptance can be carried out to add to the contextual knowledge. This can be done through interviewing relevant authorities on their experience regarding the user behaviour and influencing factors for the technology.

Beyond the exploratory research, scientific and objective evidences of a conclusive research could support the broad findings of an exploratory research. Conclusive research design is much more systematic and structured (Malhotra, 2004). As the exploratory research could yield a potential direction for a research hypothesis, the conclusive research could test these hypotheses, and yield an objective answer to the research questions (Malhotra, 2004). For the explanatory research, the various strategies available to the researcher include case studies, experimentation, simulations, action research and surveys that can help identify the factors influencing the acceptance or rejection of mobile ticketing technology in Saudi Arabia. Case

studies, experiments, surveys and interviews however are the most common strategies used in evaluating the adoption of innovative information systems (Mingers, 2003). Survey strategy however remains the most dominant one with almost three-quarters of studies using this strategy to evaluate the adoption of innovation information system technologies (Choudrie & Dwivedi, 2005). Survey approach is also most useful while evaluating the adoption of innovative technologies by individuals due to the theoretical frameworks available that have been empirically tested in varied researches (Choudrie & Dwivedi, 2005; Zikmund, 2003).

However, as highlighted in the literature review, context plays an important role in the acceptance of innovative technology by individuals and thus an in-depth enquiry will be needed to analyse the factors influencing the adoption of mobile-ticketing technology in Saudi Arabia. In-depth interviews enable collection of detailed information regarding the choices and behavior of individuals and at the same time also enable exploration of the new issues related to the research phenomenon (Collis & Hussey, 2009). Moreover, when used alongside a structured instrument of data collection such as questionnaire based survey, the findings of in-depth interviews can help contextualize the findings and provide reasoning for the behavioural patterns observed during the research. Moreover since the in-depth interviews are carried out in a relaxed manner, the participants are more likely to think through the answers leading to higher quality response than say face-to-face surveys which are usually carried out in a research setting that may not enable the participants to relax or think through their responses (Wright, 2005). Interviews however also have the associated limitations of being time-consuming and sometimes prone to the bias of both the participants as well as interviewer. Interviews also cannot be generalized (Choudrie & Dwivedi, 2005).

4.6   Techniques and procedures

This section discusses the techniques and procedures that will be used to collect data from the desired sample and also covers the sampling techniques that will be used for selecting the research participants. The current study will use both the questionnaire and the interviews for data collection. The questionnaire instrument will be collecting quantitative data while the interviews will be used for collecting the qualitative data.

The research requires a specific location to conduct the interviews and survey, thus, the researcher will travel to an airport in Saudi Arabia in order to administer the survey

questionnaire and conduct the interviews among the sampled participants. For both the quantitative and qualitative phases of the research, a consent form is presented to the respondents before the interview or survey, in order to obtain the informed consent of the respondents to participate. The consent form is presented in the appendix (Appendix-1).

For the qualitative part of the study, the researcher will contact the administration of airline companies in order to inform them of the purposes and requirements of this research via email. The email will contain the request for participation and will explain the need to interview several of their staff. The airline company that agrees to participate will be asked for their preferred schedule when the interviews will be conducted. On the agreed upon date, the interviewees from the various departments will be asked to be interviewed individually and privately. Their informed consent will be asked prior to the interview. They will be informed that the whole interview process will be recorded for documentation and for transcription for later data analysis. The interviewer will also take some notes during the course of the interview and will also ask follow-up questions if the responses of the interviewees are unclear.

4.6.1   Instruments for data collection

For the qualitative part of the research, the researcher formulated an interview guide based on the past literature related to the adoption of innovative technologies and the objectives of the research. Since four departments have been included in the research, the questions have been formulated specifically for these departments based on their specialisation and possible understanding regarding the mobile commerce adoption. The list of questions has been included in Appendix-2. The interviews are semi-structured with the scope for customisation based on the progress of the interview (Sinkovics et al., 2005).

The survey on the other hand has been carried out through a structured questionnaire (Appendix-3) that has been designed on the basis of the reviewed literature. Part-1 of the questionnaire is divided into eleven parts that represent the conceptual framework designed for the research. These components include: ease of use, usefulness, Risk, Use Context, Trust, Compatibility, Social Influence, Mobility, Cost, Attitude and behavioural intention. These information regarding the perception of respondents regarding these components has been collected through statements describing the perceived behaviour of the customer. For instance, to collect information related to the perceived ease of using the mobile ticketing process, four

statements need to be rated by the respondents based on their perceptions regarding the ease of learning, purchasing and actually purchasing the ticket using the mobile. The answers have been collected through a five-point likert scale, a popular scale for collecting information from survey respondents (Sekaran, 2000) and the scale ranges from "Strongly disagree" to "Strongly agree"

Part-2 of the questionnaire is aimed at collecting information regarding the demographics of the respondents and required them to provide information on their gender, qualification, age and nationality.

4.6.2   Validity and reliability of questionnaire

Key quality concerns for the research instrument such as a questionnaire are its ability to measure the aspects required to be measured by the research, also known as validity and its ability to generate same results at varied times to ensure accurate measurement, which is also known as reliability ((Creswell, 2003). This is especially for situations where the research is collating information on the perceptions and attitudes of respondents since the changes in the environmental factors should not cause the research findings to vary (Saunders et al., 2009).

Validity of a questionnaire can be improved by ensuring that the questions correspond well to the theoretical concepts (Saunders et al., 2009). In case of the research questionnaire, breaking down the factors included in the conceptual framework into statements that will represent these factors appropriately was needed. For this, the past researches related to measuring technology adoption amongst the customers were used as a reference in phrasing the statements (Howcroft et al., 2002; Huang et al., 2007; Gefen & Straub, 2000; Lin, 2011; Noor, 2011). Validity of the questionnaire however can only be estimated based on the researcher's assumptions and cannot be accurately measured.

Reliability on the other hand is assured through a questionnaire design that is easy to understand and is as neutral as possible. One of the ways in which the reliability of this questionnaire was improved was through the use of pilot study to evaluate not just whether the respondents have understood the questions but to also ensure that the questionnaire length and sequencing was appropriate and will not deter the data collection process (Creswell, 2003). The initial interview guide and questionnaire are presented to ten of the researcher's peers that were instructed to

evaluate the clarity and quality of the statements in the instruments. The researcher noted the comments and the instruments were amended according to the suggestions of the pilot study respondents. The cover letter provided with the survey link to the respondents is also expected to improve the reliability since the research context was clearly explained to the respondents and is expected to have created better understanding of the questions being asked (Saunders et al., 2009). The reliability of the questionnaire however will also be determined through Cronbach's alpha that measures the internal consistency of the scale used in the research instrument (Saunders & Lee, 2005). Cronbach's alpha has been found to be effective in assessing the reliability of multi-item scales in consumer research (Saunders & Lee, 2005).

4.7 Procedure for sampling and data collection

4.7.1 Qualitative interviews

Qualitative interviews with the airline employees will be held in Saudi Arabia and to be specific, in the Saudi Airline Administration building. Airline employees especially those associated with the ticketing and mobile ticketing processes will be most suitable to gain an understanding on the issues involved in the acceptance or rejection of mobile-ticketing in the country. Since the research will aim for limited number of interviews that can effectively and efficiently provided the information needed to address the research questions, these employees will be selected through purposive sampling technique. Purposive sampling is a non-probability sampling technique which means that the sample chosen to be included in the survey may not be representative of all the employees of the airline (Creswell, 2003) but these employees have been chosen based on the judgement of the researcher for their ability to provide the best inputs to the issues related to the acceptance of mobile ticketing in Saudi Arabia. These employees will be chosen from the departments that are directly or indirectly involved in the mobile ticketing process at the airline and thus will include the employees directly associated with e-ticketing and m-commerce processes in the organisation as well as those who will have information on the factors that might be affecting the adoption of mobile ticketing services offered by the airline. This will include employees from the technology, ticketing and sales and marketing departments.

Employees that are responsible for the development of the technology used by the airline as well as its maintenance will need to be included for their knowledge on the experience of the customers with the ticketing platform and the inclusion of customer experiences into the technological design. The research will also include employees involved with the actual ticketing process such as the central ticket office (CTO) of the airline due to their understanding on the customer experience related to mobile ticketing and awareness of the factors that encourage or discourage customers from using mobile-ticketing for their airline reservations in Saudi Arabia. Besides these the employees from sales and marketing teams will also be included for their understanding on the ticket sales happening through m-commerce and their awareness on the market trends related to mobile ticketing through their own consumer research or those conducted by other agencies.

The sample size in case of qualitative interviews is limited due to the detailed investigation that is needed for each participant with the focus being on the extraction of maximum knowledge from the included participants rather than including higher number of participants (Collis & Hussey, 2009). Thus, the process would involve interview with eight airline staff across the four departments of ticketing, technology, sales and marketing that are involved in the overall implementation of mobile ticketing services offered by the airline. The interviewees were made up of two personnel from each of the following departments: Central Ticket Office (CTO), Sales department, Advertising and marketing department, and Information Technology department. The sample size is sufficient enough in gaining insight about the experiences and opinions of the personnel who provide service for the m-commerce technology of e-ticketing.

4.7.2 Quantitative survey

Quantitative survey needs to be carried out with the airline customers in Saudi Arabia who have either tried or never tried using m-commerce for their ticketing needs. The questionnaire design has been based on the theoretical frameworks covered in the literature review and the conceptual framework developed for the research. The respondents for the survey will be approached for their participation at the King Abdul-Aziz airport in Saudi Arabia and while some of the respondents will be approached in the VIP lounge, Al Fursan, others will be approached at different places across the airport to ensure that consumers with varied demographic and psychographic segments will get included in the research.

In terms of the sampling technique, the research will employ non-probability sampling since the researcher will only be available for one week at the airport and will need to gather the respondents from amongst the air travellers during the specified time. Thus, convenience sampling will be used to approach the respondents. In terms of the respondent profile, the individuals will be selected on the basis of age between 17 and 69 years of age since men and women below the age of 17 years are not allow to travel independently in Saudi Arabia (Saudia, 2015) and those above 69 years are less likely to be making their own travel arrangements. All the selected respondents will be handed out the sheets with the link to the online survey and the research purpose, scope, use of data and duration of the survey highlighted. While the link and the related information is being handed out at the Saudi airport, the survey is not carried out there due to the rushed schedule of travellers and thus the assumption that the travellers will not be in a comfortable environment to be able to think through the responses. On the other hand, the respondents can fill in the online questionnaire at a place and time that is convenient to them and will be more likely to pay attention to the questions in their natural environment (Wright, 2005). Researcher or self-administered survey at the airport however could have provided higher control to the researcher in terms of addressing the queries of the passengers but would have also limited the number of passengers that could comfortable respond to the survey while rushing to catch their flights. Also, being an online survey the researcher also expects that the some of the surveys may not be completed entirely due to lack of understanding by the respondents and those responses will be dropped during the data analysis stage.

The desired sample size for the quantitative survey is about 750-800 respondents and thus the survey sheets will be handed out to at least 2000 respondents in the hope of at least 40% response rate. Since the survey is being carried out as an online survey the expected response rate is around 25% (Saunders et al., 2009), however since the survey sheets are being personally handed over to the travellers and the researcher explaining the purpose, scope and importance of the survey to the ticketing process, there is expectation of slightly higher response rate of 40%. The online survey will be uploaded at http://www.survs.com to enable collection of data in a structured manner. Although the researcher had a target of 800 responses, they ended up with 207 due to factors such as time taken to have permission in being physically present in the area after the security checks for departing passengers. The permission was granted for roughly a week and limited to few hours everyday during a non busy period so that researcher can access the VIP lounges as well so that to give a mix of different economic level of

passengers. Even with all of the above the response was lack lustre as majority of passengers approached tend to be males and they felt slightly intimated being approached by the researcher being female (because of the culture of the country the survey was being conducted in). Due to the above factors the scope or total respondents that researcher was able to achieve was around 500 (300 within the airport and 200 online surveys) leading to the response rate of around 40%. Researcher has discussed the impact of limited respondents in the limitation section (ch 7.3) wherein the discussion focuses if the results of the research would have been significantly different and the impact if would have had if any.

4.8   Data analysis

Since the research is being carried out as an explanatory research, detailed analysis will be carried out for both the interviews as well as survey data. For the qualitative survey, the recorded audio interviews will be transcribed and the data will be analyzed using content analysis (Creswell, 2003). The transcripts will be divided into segments, with each segment containing a specific idea or construct. The segments will be grouped together into similar categories. The unifying factor for each of the categories will be determined by the researcher based on the prior knowledge about m-commerce from previous literature. These unifying factors will be identified as themes and each theme will be discussed individually in the results section, with direct quotes from the interview that would reflect the meaning of the theme (Bryman, 2012).

The quantitative data on the other hand would be encoded in the software statistical package for social sciences (SPSS) for statistical analysis. The data will be recoded into numerical values with each response corresponding to particular value. The demographic variables will be analyzed using descriptive statistics, in order to have an idea of the composition and distribution of the sample, and to judge whether it is representative of the desired population. The data corresponding to the research variables from the conceptual variables such as perceived ease of use, perceived usefulness, trust, risk, social influence, cost, compatibility, mobility, attitude and behavioural intention however will be subjected to detailed analysis. Besides the descriptive analysis used to describe these variables, associative analysis will be carried out to determine if the correlations between these variables are as expected as per the literature. This would then be followed by regression analysis that would also include factor analysis and will help in evaluating the combined impact of research variables (Collis &

Hussey, 2009) in determining the attitude and behavioural intention of the airline customers towards the use of m-commerce for their ticketing needs. The findings from the qualitative interviews and quantitative survey will then be analysed in combination to address the research questions.

4.9   Ethical considerations

Researchers are compelled to create enquiry that will generate new knowledge that will add to the existing knowledge on the research subject, however consideration of ethical issues is essential for the adequate data collection, and the creation of the atmosphere of trust between the researcher, the respondents, and the readership (Saunders et al., 2007). Ethical considerations related to the protection of the human participants during and after the data collection, providing them with adequate information necessary for them to choose to participate in the research and obtaining their consent are essential to carry out an effective and meaningful research (Creswell, 2013). Oates (2005) further suggests that the participants should be aware of the risks associated with the research and should not be coerced into participating as this will enable the researcher to adequately ensure their safety and security and create a trusting atmosphere for data collection. However, even when written or verbal consent is obtained from the participants or institutions to which the participants belong (Creswell,. 2013), it may not ensure immunity from future difficulties and this also leaves it up to the researcher to identify the ethical issues that may arise from the research and address them before, during and after the research (Khanlou & Peter, 2005).

The research is using both qualitative and quantitative research strategies in the form of in-depth interviews and questionnaire based survey and some of the ethical considerations associated with these strategies are related to the protection of their privacy, rights, diginities, sensitivities (Ritchie et al., 2013), no deception or harm or stress to the participants, appropriate consent and choice to withdraw from the process when desired (Saunders et al., 2007). Moreover the participants need to be aware of the scope of the research, profile of other participants, usage of data collected, its storage and confidentiality as well as profiles of people who will have access to the data or the results of the research (Bryman, 2012). This will enable them to make an informed choice on participation.

Three main ethical practices will be adhered to in data collection for this study including informed consent, confidentiality and anonymity. Moreover, the research will also only collect data that is important to achieve the research objectives (Cooper et al., 2006). Schenk et al. (2006) also suggest that the research needs to be aimed at adding value to the social group being researched and the findings of the research will identify factors that will improve the mobile ticketing process for both the airline employees and customers.

The research process will also ensure voluntary participation through information sharing and informed consent. Consent form will be used for collecting quantitative data through questionnaire survey as well as for qualitative in-depth interviews and written approval will be taken from all the participants. In addition, qualitative interviews will also use written consent of the airline authorities to protect the participants and the information related to the purpose, duration and procedure will be shared in advance with the authorities and individuals. The participants would also be made aware of their rights of withdrawing and seeking answers on the research process. Privacy of data collected will be ensured through controlled access to the data and this will be informed to the participants. Privacy issues will also be addressed through use of fictitious names to disguise the identities of the employees that were interviewed. However, even then some people may be able to associate the research data with the individuals (Khanlou & Peter, 2005) since the name of the airline and department will be included in the findings to ensure their quality. Moreover, the research data will not be used for commercial purposes and raw data will not be shared with authorities outside of the academic needs of the project.

4.10 Research limitations

It is essential to recognize that this current research has some boundaries but have been effectively addressed by the researcher through the methods chosen. Since humans are complicated and abstract, with interpersonal differences, most important topic on social sciences cannot be put under objective assessment and unbiased security for every construct. Furthermore, qualitative research has been attacked for sometimes 'forcing' responses or people into categories that does not necessarily 'fit' in order to make meaning. Because of this, the method of triangulation was employed in order to ensure high levels of validity and reliability of research results. The survey method representing the qualitative part of research and being less reliable than statistical calculations is triangulated with concise statistical

calculations, using analysis of variance and regression; this will hopefully support the hypothesis set out for the present research. Quantitative research strategies usually have higher reliability because of its repeatability property, and their results are statistically reliable. By presenting all subjects with a standardized questionnaire, survey research helps eliminate unreliability in researcher observations. Furthermore, careful wording of the questions can greatly reduce the subject's own unreliability. Thus, a pilot study was conducted in order to make sure that the questionnaire measures what it needs to measure.

In terms of application of measures that captures the original research constructs being focused on, quantitative research has low validity, since it tends to use a limited portion of measures. These scales provide shallow, unrealistic information according to recent research studies, resulting to the challenge of assessing the social situation in its complexity. Reason and Rowan (1981) stated that the "results of quantitative research may be statistically significant but are often humanly insignificant; that is, some things which are numerically precise are not true, and some things which are not numerically precise are true". This limitation has been effectively addressed by means of using the highly inductive descriptive statistical analysis the nature of which is summative, and which helps to obtain a wider and more complete picture wherein both qualitative and quantitative research findings fit.

4.11 Conclusion

This chapter discussed the research methodology used to carry out the research as well as discussed the research choices related to the decisions needed to design the research. The research will be carried out as an exploratory and explanatory mixed-methods research that will be both deductive and inductive and use interview and survey strategies for qualitative and quantitative research respectively. The research will be designed based on the philosophies of positivism and phenomenology and will use non-probability sampling methods to collect the research sample. In terms of data collection, the interviews as well as survey will be carried out in Saudi Arabia with the airline employees and customers respectively and online survey will be used for the quantitative data collection. The data analysis will involve content analysis for the qualitative interviews and descriptive, associative and regression analysis for the quantitative survey. The chapter also discussed the limitations of the research and the steps that have been taken to overcome some of these limitations.

5 CHAPTER FIVE: RESULTS AND ANALYSIS

This chapter covers the results of the quantitative survey carried out amongst the passengers at the King Abdul-Aziz airport and the qualitative in-depth with the Saudi airline executives in Saudi Arabia. Explain very briefly that this chapter just presents results and analysis quite straightforwardly, to be followed by discussion in Chapter 6.

5.1 Results of the quantitative survey

5.1.1 Research variables

As discussed in the literature review earlier, Attitude (ATT) towards acceptance of new technology (as in TAM) is guided by the Perceived Usefulness (U) and Ease of Use (EOU) of the new technology. Thus for the current research, ATT or the attitude towards mobile ticketing becomes a dependent variable and U and EOU or the perceived usefulness and the perceived ease of use will be the independent variables in the research.

Further, as per the Unified Theory of Acceptance and Use of Technology (UTAUT), Behavioural Intention (BI) is affected by perceptions of Trust/privacy (T, R), Usefulness (U), Ease of Use (EOU), Social Influence (SI), Convenience (UC, C, M) and Cost (CO). The Theory of Reasoned Action (TRA) also indicates that Behavioural Intention is a combination of the attitude and subjective norms that are largely driven by the social influence on an individual. Moreover, the demographic variables for which the data have been collected also include Gender (G), Age (A) and educational qualification (E) of participants.

Thus, the various dependent and independent variables in the research are as set out below in Table 1:

Dependent variables	Independent variables
BI	U
ATT	EOU
	T
	R
	SI
	UC
	C
	M
	CO
	ATT
	G
	A
	E

Table 1: Research Variables

5.1.2   Sample composition

Table 2 below describes the final composition of the sample used in the research. As seen here there are a higher proportion of male respondents than females due to the mix of travellers at the King Abdul-Aziz airport in Saudi Arabia from where the respondents were chosen. Almost 82% of the respondents were in the age groups 18-35 years: this is due to convenience sampling being used for selecting the respondents and is thus representative of the travellers at the King Abdul-Aziz airport; obtaining official travel statistics from the airport authorities was difficult and referring to the demographics of the country we know that 60% of the population is between 21-70 age group, which was also the age range of the people that were surveyed. Population under 21 aren't allowed to travel without permission of parents and thus we didn't had a respondent below 21. Also, almost 90% of the respondents were Saudi nationals since the nationals of Saudi Arabia were specifically targeted by the researcher and physical appearance was used as a criterion for short listing the respondents. However, some other nationalities were included in the survey due to the inability of the researcher to distinguish between the nationals of nearby regions like Kuwait, Jordan and Syria, they were included in the research to help the researcher use a holistic dataset and draw conclusions based on how various nationalities flying Saudi airlines were using technology and their attitude towards it.

		Frequency	Percent (%)
Gender	Male	150	72.5
	Female	53	25.6
	Missing	4	1.9
Educational Attainment		22	10.6
	High School	12	5.8
	Graduate	81	39.1
	Postgraduate	65	31.4
	Doctoral	27	13
Age		15	7.2
	>55	1	0.5
	18-25	64	30.9
	26-35	105	50.7
	36-45	15	7.2
	46-55	7	3.4
	Total	207	100
Nationality	Missing	18	8.7
	Jordan	1	0.5
	Kuwaiti	1	0.5
	Saudi	185	89.4
	Syrian	1	0.5
	Yemeni	1	0.5
	Total	207	100

Table 2: Sample composition

5.2 Reliability of measurement

Reliability of a measure indicates the consistency of the measurement in evaluating the desired variable. A high reliability indicates the ability of the measurement to provide consistent results (Cooper & Schindler, 2003)**.** Internal consistency of the measurements can be evaluated using Cronbach Alpha which calculates the average of various coefficients which are obtained through multiple splitting of the scale items (Malhotra, Birks, Palmer, & Koenig-Lewis, 2000). A measurement with Cronbach Alpha value of more than 0.7 is considered to be a reliable. In the current research, Cronbach Alpha has been used to determine the reliability of various scales used in the research, with a lower acceptable limit set at 0.6 (Nunnally, in Saunders et al., 2009). Cronbach Alpha coefficients have been calculated for all the scales included in the model (Cooper & Schindler, 2003) and the value was higher than 0.7 for all the ten scales. As

seen in the table below, all the measures have a Cronbach Alpha value of higher than 0.6 and are thus all reliable scales of measurement.

Scale	Items	Cronbach's alpha
All scales	PEOU	0.931
	U	
	PR	
	UC	
	T	
	C	
	SI	
	M	
	CO	
	ATT	

Scale	Items	Cronbach's alpha
PEOU	Easy to learn	0.852
	Easy to purchase	
	Clear and understandable	
	easy to perform the steps needed	
U	Faster	0.716
	Useful	
PR	phone reliable	0.766
	network reliable	
	low risk of battery and loss of network	
	small risk technical problem	
	small risk of errors	
	small risk of billing	
	small risk of not receiving or delay	
UC	travelcard not available	0.8
	Nocash	
	in a hurry	
	unexpected purchase	
	long queue	
T	trustworthy ticket providers	0.833
	mobile operator is trustworthy	
	capable and competent ticket providers	
	capable and competent mobile operator	

C	compatible with other uses of phone	0.82
	suitable for single ticket purchase	
	compatible with style and habits	
	compatible with use of public transport	
SI	users are front runners	0.695
	mobile ticket is trendy	
	gets more respect	
M	resolves queueing	0.833
	independent of time	
	independent of place	
	no need to carry cash or card	
CO	Inexpensive	0.722
	reasonable price	
	most affordable single ticket	
ATT	good idea	0.813
	wise	
	like the idea	
BI	Intend to use	0.819
	Predict to use	
	Plan to use	

Table 3: Cronbach Alpha values for the scales used

5.3 Descriptive analysis

Table 3 below provides the descriptive values for the variables used in the research and describes the mean, standard deviation as well as the skewness and kurtosis of the variables. Descriptive values for the items under the scale variables are described in Appendix 1.

The mean values for the variables in the table below indicate the level of agreement of the respondents on the given parameters for the mobile technology. The respondents have rated the variables related to use of mobile technology for ticketing purposes on a scale of 1 to 5 where 1 means strong disagreement and 5 means strong agreement.

It can be seen that amongst the independent variables, Perceived Ease of Use (EOU) got the highest scores (Mean=3.85, S.D=0.8) out of all the variables, which means that the respondents perceive the use of mobile commerce for E-ticketing to be particularly easy to use. The values for items under this scale (Appendix ?) suggest that the respondents perceive E-ticketing to be

clear and understandable (Mean = 3.93, S.D. = 1.03) as well as easy to learn (mean = 3.92, S.D. = 0.869).

Perceived EOU is followed by Usefulness (Mean = 3.8, S.D = 0.85), Mobility (Mean = 3.69, S.D = 0.9), Compatibility (Mean = 3.65, S.D = 0.96) and Context of use (Mean =3.56, S.D=0.81). Perceived Usefulness indicates the perception of the users regarding the benefits offered by the use of mobile commerce for e-ticketing as against other options, while mobility refers to the perceived benefits of the mobile commerce related to the mobility benefits offered by this mode of ticketing. Compatibility refers to the compatibility of the mobile commerce e-ticketing mode with the behaviour, phone and ticketing options as well as transportation modes. The context of use on the other hand refers to the various situations that make it beneficial for the mobile ticketing to be used as against other modes of ticketing. The high scores received on these variables suggest that the respondents perceived mobile ticketing to be offering these benefits to them and this indicates the positive perception of the users regarding these benefits of mobile ticketing.

The variables that got the lowest scores in the survey were the cCost (Mean =3.1, S.D=0.98), Trust (Mean =3.13, S.D=1.05) and perceived Risk (Mean =3.38, S.D=0.83). Cost refers to the total ticket cost to the users while the trust refers to the trustworthiness and competence of the various parties involved in mobile ticketing including the ticketing agencies as well as the mobile operators. The perceived risk includes all the risks associated with the mobile ticketing such as the failure of phone, network, billing and operations that may lead to delay in the users receiving their tickets when purchased through this medium; (this excludes the issue with the price differences as they tend to be similar online). Lower scores on these variables indicate the concerns of the users with regards to the cost, trustworthiness and risk associated with the mobile ticketing services. These scores indicate that while the respondents agreed with the perceived benefits of using mobile technology for ticketing in terms of the Usefulness (U), Ease of Use (EOU), Mobility (M) and Use Context (UC), there also exist issues associated with lower levels of Trust, higher perceived Cost and perceived Risk of using mobile technology for the ticketing services. It can also be seen here that the standard deviations are highest for Trust, Cost and Compatibility, which indicates that the users vary the most in their perception on these parameters.

The scores for the two dependent variables Attitude (M=3.66, S.D=0.86) and Behavioural Intention (M=3.61, S.D=0.91) indicate neutral to strong agreement of the respondents on these two variables. While Attitude refers to the positive attitude of the users towards the use of mobile ticketing, Behavioural Intention refers to their intention of using mobile ticketing for their ticketing requirements. These scores thus indicate that the respondents have better than average positive Attitude towards the use of mobile technology for ticketing services at 3.66 and a better than average Behavioural Intention towards using mobile ticketing for their ticketing requirements. (Average in this case implies an arithmetic value of 2.5 or a median of 3 on a 1-5 point scale)

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PEOU	207	3.85	0.8	-1.24	0.17	1.32	0.34
U	207	3.8	0.85	-1.25	0.17	1.21	0.34
PR	207	3.38	0.83	-0.32	0.17	-0.7	0.34
UC	207	3.56	0.81	-1.5	0.17	3.81	0.34
T	207	3.13	1.05	-0.4	0.17	0.19	0.34
C	207	3.65	0.96	-1.63	0.17	3.01	0.34
SI	207	3.44	0.92	-1.18	0.17	2.27	0.34
M	207	3.69	0.9	-1.82	0.17	4.45	0.34
CO	207	3.1	0.98	-0.36	0.17	0.23	0.34
ATT	207	3.66	0.86	-1.98	0.17	4.38	0.34
BI	207	3.61	0.91	-1.84	0.17	3.94	0.34

Table 4: Descriptive statistics with Skewness and Kurtosis values

Table 4 also includes the measures of skewness and kurtosis for all the variables, which are indicators of the lack of symmetry and peak of the distribution respectively. These measures are important since the classical statistical tests are based on the assumptions of normality of data.

The skewness for all the variables is negative, which indicates that the data is leaning towards the left (Bai & Ng, 2005) or lower values for each of the variables and indicates that a higher number of people have rated the above variables at the lower end. McDonald and Bookstaber (1991) suggest that skewness between -2 and 2 is acceptable for statistical analysis. As seen in the above table, the skewness for all the variables is within this range and is thus acceptable.

A lower kurtosis coefficient indicates flatter curves while higher values indicate distinct peaks in the data. Kurtosis values for the research variables ranges from -0.7 to 4.45, which indicate a mixed peak for the variables. McDonalds and Bookstaber (1991) suggest that a kurtosis coefficient value of up to 6 is acceptable for statistical analysis. Since all the variables in the table above fall within the acceptable range, the data is suitable for further statistical analyses that assume normality of data.

5.3.1 Descriptive analysis across demographic groups

Technology acceptance has also been found in the past to be influenced by the demographic features of the technology adopters and thus demographic variables have been included in UTAUT for their impact on the Attitude as well as Behavioural Intention towards use of an innovative technology. Three demographic variables were included in the research, i.e. gender, age and the educational qualification of the respondents. The he section below describes the mean values of the research variables across demographic groups. The mean values have also been compared to evaluate the significance of the differences using independent samples t-test for the gender and one-way ANOVA test for the age group and educational qualification. The significance of the difference has been evaluated at a significance level of .05.

5.3.1.1 Descriptive analysis across genders

Table 5 below indicates that the males included in the research had higher mean values for the Use context, Trust, Cost, Social Influence, Mobility, Compatibility and Attitude, while females had higher values for Perceived ease of use, Usefulness and overall Behavioural Intention to use mobile commerce for their ticketing needs. However, these mean differences are not significant at a significance level of 0.05.

Variable values across the two genders							
		N	Mean	Std. Deviation	T-test for equality of means		
					t	df	Sig. (2-tailed)
PEOU	Male	150	3.86	0.8	-0.44	201	0.661
	Female	53	3.92	0.74			
U	Male	150	3.78	0.85	-0.51	201	0.61
	Female	53	3.85	0.83			
PR	Male	150	3.43	0.83	0.958	201	0.339
	Female	53	3.3	0.79			
UC	Male	150	3.63	0.7	0.25	201	0.803
	Female	53	3.6	0.71			
T	Male	150	3.24	0.97	1.379	201	0.169
	Female	53	3.02	1.02			
C	Male	150	3.74	0.83	0.743	201	0.458
	Female	53	3.63	0.94			
SI	Male	150	3.54	0.81	1.419	201	0.157
	Female	53	3.35	0.88			
M	Male	150	3.76	0.77	0.269	201	0.788
	Female	53	3.73	0.8			
CO	Male	150	3.18	0.94	1.219	201	0.224
	Female	53	3	0.93			
ATT	Male	150	3.71	0.78	0.126	201	0.9
	Female	53	3.7	0.76			
BI	Male	150	3.65	0.83	-0.33	201	0.744
	Female	53	3.69	0.79			

Table 5: Variable values across the two genders and independent samples t-test

5.3.1.2 *Descriptive analysis across age groups*

A comparison of the Behavioural Intention towards use of mobile commerce for ticketing requirements indicates that the age groups 36-45 years showed the highest intention towards using the technology (mean=3.87), followed by 26-35 years (Mean=3.76). The difference across age groups is however not significant since the p value is 0.096. Also, for the attitude of the respondents towards use of mobile commerce for ticketing services, a similar result was obtained with 36-45 years with highest mean value (Mean = 3.91), followed by 26-35 years (Mean = 3.81), but with non-significant difference across age groups (p=.060). The only research variable for which a significant difference in the mean value was observed across age

groups was trust in the technology (p = 0.048), where again the age groups 36-45 years (Mean = 3.52) and 26-35 years (Mean = 3.16) had higher mean values than other age groups and specifically for the age group 46-55 years, where a mean value of 2.29 indicated lack of trust in the technology. For all the other research variables, no significant difference could be observed across the age groups included in the research (although we have a concentration of the group between age of 18-35)

Descriptive analysis across age groups								
		N	Mean	Std. Deviation	One-way ANOVA test			
					Sum of Squares	df	Mean Square	F	Sig.
PEOU	18-25 years	64	3.81	0.7	0.525	4	0.131	0.215	0.93
	26-35 years	105	3.92	0.82					
	36-45 years	15	3.87	0.77					
	46-55 years	7	3.93	0.94					
	>55 years	1	4						
	Total	192	3.88	0.78					
U	18-25 years	64	3.8	0.8	1.09	4	0.272	0.382	0.821
	26-35 years	105	3.81	0.88					
	36-45 years	15	3.97	0.48					
	46-55 years	7	3.5	1.22					
	>55 years	1	4						
	Total	192	3.81	0.84					
PR	18-25 years	64	3.29	0.77	3.754	4	0.939	1.409	0.233
	26-35 years	105	3.39	0.82					
	36-45 years	15	3.64	0.93					
	46-55 years	7	3.49	0.92					
	>55 years	1	4.86						
	Total	192	3.39	0.82					
UC	18-25 years	64	3.63	0.64	0.596	4	0.149	0.262	0.902
	26-35 years	105	3.6	0.8					
	36-45 years	15	3.52	0.82					
	46-55 years	7	3.49	0.87					
	>55 years	1	4.2						
	Total	192	3.6	0.75					
T	18-25 years	64	3.07	0.99	9.441	4	2.36	2.45	0.048
	26-35 years	105	3.16	1					
	36-45 years	15	3.52	0.92					
	46-55 years	7	2.29	0.59					

	>55 years	1	4.5					
	Total	192	3.13	1				
C	18-25 years	64	3.69	0.93	1.112	4	0.278	0.351	0.843
	26-35 years	105	3.74	0.88				
	36-45 years	15	3.63	0.88				
	46-55 years	7	3.37	0.8				
	>55 years	1	4					
	Total	192	3.71	0.88				
SI	18-25 years	64	3.42	0.86	1.108	4	0.277	0.375	0.827
	26-35 years	105	3.52	0.86				
	36-45 years	15	3.36	0.78				
	46-55 years	7	3.67	1.05				
	>55 years	1	4					
	Total	192	3.48	0.85				
M	18-25 years	64	3.68	0.82	2.64	4	0.66	1.005	0.406
	26-35 years	105	3.83	0.78				
	36-45 years	15	3.67	0.89				
	46-55 years	7	3.32	0.98				
	>55 years	1	4.25					
	Total	192	3.75	0.81				
CO	18-25 years	64	3.16	1.01	2.034	4	0.509	0.585	0.674
	26-35 years	105	3.16	0.85				
	36-45 years	15	3.2	1.08				
	46-55 years	7	2.62	1.02				
	>55 years	1	3					
	Total	192	3.14	0.93				
ATT	18-25 years	64	3.59	0.88	5.352	4	1.338	2.303	0.06
	26-35 years	105	3.81	0.65				
	36-45 years	15	3.91	0.82				
	46-55 years	7	3.1	0.98				
	>55 years	1	4					
	Total	192	3.72	0.77				
BI	18-25 years	64	3.54	0.9	5.223	4	1.306	2.005	0.096
	26-35 years	105	3.76	0.72				
	36-45 years	15	3.87	0.73				
	46-55 years	7	3.05	1.21				
	>55 years	1	4					
	Total	192	3.67	0.82				

Table 6: Variable values across age groups and one-way ANOVA test

5.3.1.3 *Descriptive analysis across educational qualifications*

Table 7 below compares the mean values for the research variables across respondents with varied educational qualifications. For the mean values of Attitude towards use of mobile commerce for ticketing needs across respondents with varied educational qualifications, no pattern could be seen with increase or decrease in the qualifications. However for the Behavioural Intention an increase in the qualification could be found to lead to an increase in the Behavioural Intention. However for both the research variables no significant difference could be observed at a significance level of 0.05. Other research variables that showed an increase in the mean values with an increase in the qualification levels were Perceived Ease of Use, Usefulness, Use Context and Trust, while a decrease was observed for Perceived risk with an increase in educational qualification. For the other variables no distinct pattern could be observed. However, none of the research variables were found to have any significant variation in the mean values across educational qualifications.

Descriptive values for research variables across varied educational qualification								
		N	Mean	Std. Deviation	ANOVA Test			
					Sum of Squares	df	Mean Square	F	Sig.
PEOU	High School	12	3.81	0.66	1.374	3	0.458	0.798	0.497
	Graduate	81	3.86	0.82					
	Postgraduate	65	3.92	0.74					
	Doctoral	27	4.11	0.6					
	Total	185	3.92	0.76					
U	High School	12	3.71	0.69	0.834	3	0.278	0.392	0.759
	Graduate	81	3.77	0.86					
	Postgraduate	65	3.9	0.86					
	Doctoral	27	3.85	0.79					
	Total	185	3.82	0.84					
PR	High School	12	3.45	0.7	0.64	3	0.213	0.309	0.819
	Graduate	81	3.45	0.81					
	Postgraduate	65	3.35	0.81					
	Doctoral	27	3.31	0.96					
	Total	185	3.4	0.83					

UC	High School	12	3.47	0.63	1.409	3	0.47	0.855	0.466
	Graduate	81	3.54	0.89					
	Postgraduate	65	3.68	0.64					
	Doctoral	27	3.75	0.46					
	Total	185	3.62	0.74					
T	High School	12	2.92	0.73	1.627	3	0.542	0.527	0.665
	Graduate	81	3.09	1.05					
	Postgraduate	65	3.23	0.96					
	Doctoral	27	3.24	1.13					
	Total	185	3.15	1.01					
C	High School	12	3.83	0.78	1.28	3	0.427	0.542	0.654
	Graduate	81	3.68	0.9					
	Postgraduate	65	3.68	0.98					
	Doctoral	27	3.9	0.61					
	Total	185	3.72	0.88					
SI	High School	12	3.47	0.77	0.407	3	0.136	0.184	0.907
	Graduate	81	3.45	0.88					
	Postgraduate	65	3.5	0.89					
	Doctoral	27	3.59	0.74					
	Total	185	3.49	0.85					
M	High School	12	3.69	0.85	1.929	3	0.643	0.958	0.414
	Graduate	81	3.74	0.84					
	Postgraduate	65	3.68	0.86					
	Doctoral	27	3.99	0.61					
	Total	185	3.75	0.82					
CO	High School	12	3.03	0.72	4.714	3	1.571	1.853	0.139
	Graduate	81	3.3	0.95					
	Postgraduate	65	2.96	0.94					
	Doctoral	27	3.28	0.87					
	Total	185	3.16	0.93					
ATT	High School	12	3.89	0.66	2.309	3	0.77	1.296	0.277
	Graduate	81	3.64	0.86					
	Postgraduate	65	3.74	0.72					

	Doctoral	27	3.95	0.62				
	Total	185	3.74	0.77				
BI	High School	12	3.5	0.59	1.303	3	0.434	0.637	0.592
	Graduate	81	3.61	0.93				
	Postgraduate	65	3.69	0.77				
	Doctoral	27	3.83	0.7				
	Total	185	3.66	0.82				

Table 7: Variable values across educational qualifications and one-way ANOVA test

5.4   Correlation analysis

Correlation analysis has been carried out to evaluate whether the relationships between the research variables as included in the research framework also existed for the research data collected from the travellers of Saudi Airlines.

Table 8 below indicates the correlation between the variables used in the research. As seen below, all the variables had a positive correlation with the other variables. The strongest correlation was found between Attitude and Behavioural Intention ($r = 0.904$, $p = 0.000$) which indicates a strong positive and significant correlation. This indicates a possibility of a positive attitude towards mobile ticketing leading to higher behavioural intention of using the technology and/or vice versa.

		PEOU	U	PR	UC	T	C	SI	M	CO	ATT	BI
	Correlations											
PEOU	Pearson Correlation	1	0.493	0.348	0.402	0.227	0.507	0.437	0.509	0.318	0.473	0.408
	Sig. (2-tailed)		0	0	0	0.001	0	0	0	0	0	0
U	Pearson Correlation		1	0.377	0.356	0.223	0.433	0.362	0.357	0.318	0.384	0.37
	Sig. (2-tailed)			0	0	0.001	0	0	0	0	0	0
PR	Pearson Correlation			1	0.297	0.445	0.391	0.409	0.319	0.438	0.325	0.311
	Sig. (2-tailed)				0	0	0	0	0	0	0	0
UC	Pearson Correlation				1	0.431	0.558	0.544	0.572	0.392	0.472	0.462
	Sig. (2-tailed)					0	0	0	0	0	0	0
T	Pearson Correlation					1	0.549	0.487	0.451	0.426	0.442	0.418
	Sig. (2-tailed)						0	0	0	0	0	0
C	Pearson Correlation						1	0.605	0.674	0.55	0.67	0.59
	Sig. (2-tailed)							0	0	0	0	0
SI	Pearson Correlation							1	0.631	0.526	0.579	0.501
	Sig. (2-tailed)								0	0	0	0
M	Pearson Correlation								1	0.484	0.62	0.574
	Sig. (2-tailed)									0	0	0
CO	Pearson Correlation									1	0.529	0.473
	Sig. (2-tailed)										0	0
ATT	Pearson Correlation										1	0.904
	Sig. (2-tailed)											0
BI	Pearson Correlation											1
	Sig. (2-tailed)											

Table 8: Correlation between research variables

Moreover, all the independent variables in the research were found to have positive correlation with both Attitude and Behavioural Intention even though the degree of correlation varied. The section below discusses the correlation of the independent variables with the dependent variables in detail.

5.4.1 Correlation with Attitude

As discussed above, Attitude (ATT) refers to the positive attitude of the users towards the mobile ticketing services and the research found a strong positive correlation of the attitude of the users with Compatibility (r=.670, p=.000), Mobility (M) (r=.620,p=.000), Social Influence (SI) (r=.579 ,p=.000), Cost (Co) (r=.529 ,p=.000) and Trust (r=.442, p=.000). Attitude towards technology (ATT) was also found to have a moderate positive correlation with Perceived Ease of Use (PEOU) (r= .473, p= .000), Use context (UC) (r= .472,p= .000), Usefulness (U) (r=.384,

p=.000) and Perceived Risk (PR) (r= .325,p=.000). The positive correlation indicates that an improvement in the perception of the users on these variables possibly contributes to an improvement in the overall attitude of the respondents towards the use of mobile technology for ticketing services.

5.4.2   Correlation with Behavioural Intention

Behavioural intention (BI) of the respondents towards using mobile technology for ticketing services refers to their intention towards the use of mobile ticketing services in the near future and it was found to have a strong positive correlation with Compatibility ($r = 0.590$, $p = 0.000$), Mobility (M) ($r = 0.574$, $p = 0.000$), Social Influence (SI) ($r = 0.501$, $p = 0.000$), Cost (CO) ($r = 0.473$, $p = 0.000$), Use context (UC) ($r = 0.462$, $p = 0.000$) and Trust ($r = 0.418$, $p = 0.000$). Behavioural Intention (BI) was also found to have a moderate positive correlation with Perceived Ease of Use (PEOU) ($r = 0.408$, $p = 0.000$), Usefulness (U) ($r = 0.370$, $p = 0.000$) and Perceived Risk (PR) ($r = 0.311$, $p = 0.000$). This indicates that all the independent variables moved in the same direction as the Behavioural Intention towards the use of technology by the respondents and possibly contributed to the overall Behavioural Intention of the respondents towards the use of mobile technology for ticketing services.

5.4.3   Other correlations

The other correlations that are significant to the research framework for the current study are the correlation between Perceived ease of use (PEOU) and Usefulness (U) and the research found a strong positive correlation between the variables ($r = 0.493$, $p = 0.000$).

Correlation analysis thus indicates that the correlations (both degree and direction) between the research variables were as per the expected results suggested by technology adoption theories, TAM and UTAUT, for the relationship between Attitude, Behavioural Intention, Perceived Ease of Use, Usefulness, Trust, Cost, Compatibility, Perceived Risk, Use Context, Social Influence and Mobility.

However while the correlation analysis suggests that significant correlation exists between the research variables as per the theoretical framework used in the research, there is a further need to evaluate the *causality* of the relationship to determine the impact of the research variables

on each other. The causality will determine the exact causes of changes in the dependent variables, Attitude and Behavioural Intention, with the changes in other research variables, and help evaluate if the causality is as per the research framework (Cohen, Cohen, West, & Aiken, 2013). The causality can be determined through regression analysis to identify the research variables that are leading to changes in the Attitude and Behavioural Intention towards use of mobile commerce for ticketing services. However, since the research variables have also shown strong inter-correlations with each other, there is a need to identify latent variables that are most significant in explaining the causality of the research variables as per the research framework and this can be carried out using factor analysis. However, the use of factor analysis needs to be preceded by the KMO (Kaiser–Meyer–Olkin) test, which evaluates if sufficient correlation exists between the research variables to justify the use of factor analysis.

5.5 KMO Test

Usually, KMO measures more than 0.6 are considered suitable for factor analysis (Ferguson & Cox, 1993). For the current data, KMO value was 0.837 (see Table 9), which indicates a high degree of correlation amongst the independent variables and this justifies the use of factor analysis for identifying latent variables.

KMO and Bartlett's Test		
Adequacy.		0.837
Bartlett's Test of Sphericity	Approx. Chi-Square	656.301
	df	78
	Sig.	0

Table 9: KMO and Bartlett's test

5.6 Factor analysis

As mentioned above, factor analysis helps in identification of latent variables that can help explain most of the variation in the dependent variables and achieves this through evaluation of joint variation in the research variables and thus a possible reduction in the number of research variables.

Under factor analysis, principle component analysis has been used to extract the factors and identify latent variables in the research. Under this, factors with Eigen value close to or greater than 1 have been chosen (Ferguson & Cox, 1993).

Total Variance Explained						
	Initial Eigenvalues			Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.379	33.688	33.688	4.379	33.688	33.688
2	1.505	11.58	45.268	1.505	11.58	45.268
3	1.19	9.153	54.421	1.19	9.153	54.421
4	0.931	7.158	61.579			
5	0.869	6.683	68.262			
6	0.775	5.962	74.224			
7	0.646	4.966	79.19			
8	0.586	4.509	83.698			
9	0.489	3.758	87.456			
10	0.476	3.66	91.116			
11	0.42	3.232	94.348			
12	0.387	2.978	97.326			
13	0.348	2.674	100			
Extraction Method: Principal Component Analysis.						

Table 10: Variance explained through factor analysis using research variables

The results of the factor analysis indicate that the cumulative variance that could be explained by the three components extracted through factor analysis was 54.42%. These components have been extracted using VARIMAX rotation along with Kaiser Normalisation for better interpretation of the factors. The table below indicates the research variables under three components that explain 54.42% of the variation. It can be seen that except for the demographic variables all the other independent variables have been clubbed together as component 1.

Component Matrix[a]				
	Component			
	1	2	3	
PEOU	0.634			
U	0.626			
PR	0.591			
UC	0.582			
T	0.548			
C	0.785			
SI	0.71			
M	0.753			
CO	0.638			
ATT	0.703			
Gender			-0.553	
Educational Attainment		0.843		
Age		0.668	0.563	
Extraction Method: Principal Component Analysis.				
a. 3 components extracted.				

Table 11: Component matrix obtained using factor analysis

However, since the testing of the research framework and its applicability for the acceptance of mobile ticketing services in Saudi Arabia needs to evaluate the relationship of behavioural intention with the research variables, the final modelling will need to include the independent variables from component 1. The next section covers the regression analysis to determine this causality.

5.7 Regression analysis

Regression analysis is used to determine the causality of the changes in the dependent variables based on the changes in the independent variables. For the research data, multiple regression analysis has been used to test the association of the factors in the model with the behavioural intention of the users of mobile ticketing services. For this, the least square estimates have been determined and two regression analyses have been carried out to evaluate the relationship between two dependent variables, BI and ATT and their respective independent variables as per the research framework based on TAM and UTAUT.

5.7.1 Regression analysis for ATT, U, EOU and SI

The research framework requires the relationships to be established between ATT, EOU and U as per TAM as well as with the SI based on the research framework established for the research. Thus, a regression analysis has been carried out with attitude towards technology as the dependent variable and perceived usefulness, perceived ease of use and social influence as the independent variables. The table below shows that there was a positive and significant relation between attitude and perceived ease of use, usefulness and social influence however the adjusted R square value of 0.396 indicates that the model is only able to predict 39.6% of variation in attitude of the consumers towards mobile commerce (Cohen, Cohen, West, & Aiken, 2013). The standardized beta coefficient values for the PEOU (β=.243), U (β=.116) and SI (β=.411) indicate that social influence has the most impact on building a positive attitude towards the use of mobile technology for ticketing services. Thus, with every one point improvement in the perceived social influence of the mobile technology use for ticketing services, the attitude towards the technology will improve by 0.411 points and similarly respective improvements of one point in the PEOU and U will lead to 0.243 and 0.116 points variation in the attitude towards the new technology. ANOVA test for the model also indicates that the model is significant at a significance level of 0.05 since it has a p value of 0.000.

Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	SI, U, PEOU[b]		Enter
a. Dependent Variable: ATT			
b. All requested variables entered.			

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.636[a]	0.405	0.396	0.67142

a. Predictors: (Constant), SI, U, PEOU

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.184	3	20.728	45.981	.000[b]
	Residual	91.512	203	0.451		
	Total	153.696	206			

a. Dependent Variable: ATT

b. Predictors: (Constant), SI, U, PEOU

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.874	0.264		3.309	0.001
	PEOU	0.243	0.071	0.225	3.421	0.001
	U	0.116	0.064	0.114	1.802	0.073
	SI	0.411	0.057	0.439	7.167	0

a. Dependent Variable: ATT

Table 12: Regression analysis with ATT as dependent and PEOU, U and SI as independent variables

5.7.2 Regression analysis with BI and ATT

The conceptual framework developed for the research also indicates a causal relationship between ATT and BI, where the attitude of the individuals towards a new technology leads to their behavioural intention to use that technology. Regression analysis has thus been carried out with ATT as independent and BI as dependent variable to evaluate if the causal relationship is significant at a significance level of 0.05. The results indicate a strong and significant causal relationship between ATT and BI and a regression coefficient of 0.989 (p=.000) indicates that this relationship is significant and with every one unit change in attitude, the behavioural intention of consumers towards the use of mobile ticketing services in the airline industry in Saudi Arabia will go up by 0.989 units.

Model Summary[c,d]

Model	R	R Square[b]	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.995[a]	0.989	0.989	0.38849	0.989	18823.242	1	206	0	1.976

a. Predictors: ATT

b. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

c. Dependent Variable: BI

d. Linear Regression through the Origin

ANOVA[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2840.909	1	2840.909	18823.242	.000[c]
	Residual	31.091	206	0.151		
	Total	2872.000[d]	207			

a. Dependent Variable: BI

b. Linear Regression through the Origin

c. Predictors: ATT

d. This total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

Coefficients[a,b]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	ATT	0.985	0.007	0.995	137.198	0	0.971	0.999

a. Dependent Variable: BI

b. Linear Regression through the Origin

Residuals Statistics[a,b]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0	4.599	3.6061	0.85064	207
Residual	-0.93084	1.06081	0.00741	0.38842	207
Std. Predicted Value	-4.239	1.167	0	1	207
Std. Residual	-2.396	2.731	0.019	1	207

a. Dependent Variable: BI

b. Linear Regression through the Origin

Table 13: Regression analysis with BI and ATT

5.7.3   Regression analysis with BI, EOU, U, PR, UC, T, C, SI, M, CO

Another regression analysis has been carried out to determine the relationship between Behavioural Intention and nine independent variables excluding Attitude towards use of new technologies as well as the demographic variables.

The table below indicates the regression model for BI and twelve independent variables. The regression model shows that only three variables were included in the final model, Mobility, Usefulness and Cost, while other variables were not found to make significant contribution towards the behavioural intention of the respondents towards the use of mobile commerce for ticketing. The ANOVA test for the model suggests that the model is significant and these three independent variables are significantly able to explain the variation in the dependent variable. The adjusted R Square value of 0.963 indicates that this model is able to predict 96.3% of variation in the behavioural intention of the participants regarding the use of mobile commerce for ticketing (Cohen, Cohen, West, & Aiken, 2013). The beta coefficients for Mobility (M), Usefulness (U) and Cost (C) stood at 0.406, 0.268 and 0.316 respectively and were found to be significantly related to Behavioural Intention. As seen through the standardized beta coefficient values, Mobility was the most important consideration for the users in determining their Behavioural Intention towards the use of mobile commerce for ticketing followed by the Cost and Perceived Usefulness associated with the adoption of new technology. The ANOVA test for the model also indicates that the model is significant with p=.000.

Model	R	R Square[b]	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.976[a]	0.952	0.952	0.82435	0.952	3633.122	1	182	0	
2	.980[c]	0.96	0.96	0.75691	0.008	34.874	1	181	0	
3	.981[d]	0.963	0.963	0.72876	0.003	15.256	1	180	0	1.76

a. Predictors: M

b. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

c. Predictors: M, U

d. Predictors: M, U, C

e. Dependent Variable: BI

f. Linear Regression through the Origin

ANOVA[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2468.878	1	2468.878	3633.122	.000[c]
	Residual	123.678	182	0.68		
	Total	2592.556[d]	183			
2	Regression	2488.858	2	1244.429	2172.102	.000[e]
	Residual	103.698	181	0.573		
	Total	2592.556[d]	183			
3	Regression	2496.96	3	832.32	1567.207	.000[f]
	Residual	95.595	180	0.531		
	Total	2592.556[d]	183			

a. Dependent Variable: BI

b. Linear Regression through the Origin

c. Predictors: M

d. This total sum of squares is not corrected for the constant because the constant is zero for regression through the

e. Predictors: M, U

f. Predictors: M, U, C

Coefficients[a,b]

Model		Unstandardized Coefficients		Coefficients	t	Sig.	Confidence	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	M	0.953	0.016	0.976	60.275	0	0.922	0.984
2	M	0.591	0.063	0.606	9.405	0	0.467	0.716
	U	0.367	0.062	0.38	5.905	0	0.244	0.489
3	M	0.396	0.078	0.406	5.05	0	0.241	0.551
	U	0.258	0.066	0.268	3.914	0	0.128	0.388
	C	0.309	0.079	0.316	3.906	0	0.153	0.465

a. Dependent Variable: BI

b. Linear Regression through the Origin

Excluded Variables[a,b]

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	PEOU	.417[c]	5.42	0	0.374	0.038
	U	.380[c]	5.905	0	0.402	0.053
	SI	.295[c]	3.972	0	0.283	0.044
	PR	.307[c]	5.299	0	0.366	0.068
	UC	.389[c]	5.288	0	0.366	0.042
	T	.231[c]	4.511	0	0.318	0.091
	C	.449[c]	5.9	0	0.402	0.038
	CO	.275[c]	4.868	0	0.34	0.073
	Gender	.154[c]	3.806	0	0.272	0.148
	Educational Attainment	.187[c]	4.204	0	0.298	0.121
	Age	.127[c]	3.459	0.001	0.249	0.182
2	PEOU	.247[d]	2.794	0.006	0.204	0.027
	SI	.173[d]	2.325	0.021	0.171	0.039
	PR	.186[d]	2.904	0.004	0.212	0.052
	UC	.247[d]	3.11	0.002	0.226	0.034
	T	.170[d]	3.426	0.001	0.247	0.085
	C	.316[d]	3.906	0	0.28	0.031
	CO	.200[d]	3.616	0	0.26	0.067
	Gender	.088[d]	2.167	0.032	0.159	0.132
	Educational Attainment	.123[d]	2.812	0.005	0.205	0.111
	Age	.083[d]	2.347	0.02	0.172	0.172
3	PEOU	.182[e]	2.072	0.04	0.153	0.026
	SI	.115[e]	1.55	0.123	0.115	0.037
	PR	.134[e]	2.087	0.038	0.154	0.049
	UC	.193[e]	2.448	0.015	0.18	0.032
	T	.113[e]	2.162	0.032	0.16	0.073
	CO	.146[e]	2.554	0.011	0.187	0.06
	Gender	.079[e]	2.024	0.045	0.15	0.131
	Educational Attainment	.113[e]	2.657	0.009	0.195	0.11
	Age	.078[e]	2.274	0.024	0.168	0.172

a. Dependent Variable: BI

b. Linear Regression through the Origin

c. Predictors in the Model: M

d. Predictors in the Model: M, U

e. Predictors in the Model: M, U, C

Residuals Statistics[a,b]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.5161	4.8179	3.5728	0.71857	207
Residual	-2.85546	2.63312	0.04072	0.70961	207
Std. Predicted Value	-4.967	1.872	-0.107	1.142	207
Std. Residual	-3.918	3.613	0.056	0.974	207

a. Dependent Variable: BI

b. Linear Regression through the Origin

Table 14: Regression analysis with BI as dependent variable

5.8   Regression analysis with PEOU and U

The Technology Acceptance Model (TAM) suggests that the Perceived Ease of Use of a technology has a positive influence on creating a positive perception towards the Usefulness of a technology. In the current research, there was a strong positive correlation between the two variables with a correlation coefficient of 0.493. To test the causality of this relationship, a regression analysis was carried out with perceived ease of use (PEOU) as an independent variables and Usefulness as a dependent variable. The adjusted R-square value of 0.955 indicates that the independent variable accounts for 95.5% of variation in the dependent variable and the rest can be attributed to factors not included in the model. The ANOVA test shows that the model is also significant. A standardized beta coefficient value of 0.977 indicates that every one point variation in the perceived ease of use of technology will lead to a 0.977 points improvement in perceived usefulness.

Model Summary[c,d]

Model	R	R Square[b]	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
					Change Statistics					
1	.977[a]	0.955	0.955	0.82307	0.955	4419.465	1	206	0	1.89

a. Predictors: PEOU

b. For regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

c. Dependent Variable: U

d. Linear Regression through the Origin

ANOVA[a,b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2993.946	1	2993.946	4419.465	.000[c]
	Residual	139.554	206	0.677		
	Total	3133.500[d]	207			

a. Dependent Variable: U

b. Linear Regression through the Origin

c. Predictors: PEOU

d. This total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

Coefficients[a,b]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound
1	PEOU	0.966	0.015	0.977	66.479	0	0.938	0.995

a. Dependent Variable: U

b. Linear Regression through the Origin

Table 15: Regression analysis to determine the impact of perceived ease of use (PEOU) on the usefulness (U) of mobile technology for ticketing services

5.9   Results of the qualitative interviews with airline personnel

The above section covered the results and analysis of the quantitative interview conducted with the users of the mobile ticketing services in Saudi Arabia. The current section covers the results and analysis of the qualitative in-depth interviews conducted with the airline personnel regarding the adoption of mobile ticketing services in the country. Eight interviews were conducted with the two personnel each from the Central Ticket Office (CTO), Sales department, Advertising and marketing department, and Information Technology department. Their perspective is important for the research since these personnel handle the concerns of the customers regarding the mobile ticketing services and are aware of the issues facing the adoption of mobile ticketing services. Their insights may explain and clarify the answers of the passenger survey: thus the two methods complement each other. All the chosen participants had spent at least two years in the organisation and thus were aware of the issues related to the mobile ticketing services of the airline. The four departments are together responsible for the infrastructure, communication, sales and support related to the mobile ticketing services of the airline and thus were expected to provide a holistic view related to the adoption of mobile ticketing services in Saudi Arabia.

The participants have been given pseudonyms for easy identification for their inputs to the research as collated in this section. As explained in the methodology chapter, real names have not been used to protect their identity. For the Central Ticket Office, two participants were Tickie30, who is female and about 30 years of age and Ticka28, who is male and 28 years of age. In the sales department, the males were around 30 and 34 years of age and are being called Sal30 and Sal34. In the Advertising and marketing department, one female was 27 years of age (Addy27) and male was 35 years of age (Mike35). In the IT department, two make participants were 25 and 32 years of age and will be referred as Tech25 and Tech32.

5.9.1   Data preparation for analysis

The interviews with the airline personnel were carried out as face-to-face interviews by the researcher and were digitally recorded to be transcribed later. The recording was carried out with the knowledge of the interviewees and was essential for the accuracy of the analysis of

the interviews (Weiss, 1995). The recordings were transcribed by the researcher to be able to classify the quotes of the interviewees into categories relevant to the research. Transcribed data was also coded (Appendix-3)and the frequency of the codes determined from the transcribed data to be able to identify themes that could be related to the research question (listed) such as ease of use (EOU), Usefulness(U), mobility (M), Compatibility (CO) & Social Influence (SI) which would help pin-point key factors influencing the behavioural intention (BI) and the attitude (ATT) on mobile ticketing technology. The research has been carried out to determine the factors that influence the acceptance of mobile ticketing services in Saudi Arabia. Since the research has been carried out with a framework developed from the past research on the subject, the in-depth interviews were carried out with the constructs of this framework in mind. The aim of identifying the impact of independent variables on the dependent variables, and even identify if any other factors besides those included in the research framework might affect the dependent variables, i.e. the attitude and behavioural intention of the customers towards mobile ticketing technologies.

Since the interviews were carried out as semi-structured interviews, detailed explanation was sometimes sought from the participants to better understand the mobile ticketing processes, since the researcher did not completely understand all the technicalities associated with the process.

5.9.2   Thematic analysis and discussion

This section covers the results of the interviews based on the analysis of the interview data related to the research question. Key themes that emerged from the interview data are as follows out of which only relative advantage was a new factor to be considered within our research as the remaining were discussed within the quantitative stage as well

1. Relative advantage of mobile ticketing over other media
2. Perceived ease-of-use or effort expectancy of mobile ticketing technology by the users
3. Trust in the mobile technology
4. Risk in the use of mobile technology
5. Use context in the use of mobile ticketing

While these themes are similar to the determinants of technology acceptance in past literature as well as the research framework used for the quantitative research, new subthemes emerged

under the larger themes that have been discussed below based on the qualitative interview/survey conducted with the staff of the organisation.

5.9.2.1   *Theme 1: Relative advantage of mobile ticketing*

This theme can also be related to the usefulness of the mobile ticketing relative to the other ticketing modes for the customers and indicates the relative benefits of the use of mobile ticketing over other modes of ticketing.

Mobile phone penetration has increased in the country and thus mobile services are also expected to rise due to the ubiquitous presence of mobile phone with the customers. One interviewee working within marketing department aged 35, mentioned "Customers are increasingly accessing websites on their mobile phones due to the mobility, ubiquity, convenience and comfort offered by the media". Even though internet has existed, the growth in the mobile technology is much faster due to the mobility benefits associated with the technology that were lacking in devices such as laptops and PCs. However, another interviewee in IT department aged 32, commented that "mobility also has the associated disadvantage of having less reliable network across the country, which leads to several incomplete mobile transactions". Interviewee from ticketing department aged 30 described, "Mobile ticketing while has reduced the cost of operations for the airline and possibly the transaction cost for the customers".Lastly, had additional detail from marketing executive aged 27 that "the medium also requires additional effort in learning to use the system and everyone may not be technologically oriented to become comfortable with this".

The relative advantage can be created for the customers through incentives offered by the organisation to use mobile technology for ticketing purposes. The male executive aged 35 from the marketing team for instance suggested that they launch promotions that will encourage the customers to use the mobile ticketing services and give this medium an advantage over other ticketing media and so far the response is mostly positive with better penetration of mobile ticketing in overall ticketing media. He further stated that this is an indication of the customers needing a reason to adapt to the new technology in their ticketing requirements and look for relative benefits.

The relative advantage also varies based on the user characteristics and executive aged 28 from tickecting department mentioned that "from ticketing pointed that several customers still rely on travel agents for their ticketing needs and thus do not opt for mobile ticketing services possibly due to lack of additional benefits as a source of motivation for them" However the 30 year old ticketing executive, mentioned that mobile technology offers the benefits of ubiquity and times when they are not able to connect with their agents they can book themselves on the relevant flights through the mobile site.

Mostly the mobile ticketing services come from the young users as highlighted by the person aged 25 from the IT team, to which person aged 35 from marketing suggested that this happens possibly due to their better technology orientation and better adaptability towards a new technology and lesser fear of associated risks. He also suggested that the penetration is higher amongst the younger users and they found the usage to be influenced by their social group.

Finally, executive aged 30 from the sales department also mentioned that even the travel agents are using the mobile sites for ticketing services due to the benefits associated with mobility and these institutional customers have lesser fear of failed transactions due to their better understanding regarding the organisational processes related to ticketing services. Another executive aged 34 from sales department also shared an example of customers who can be seen booking their tickets near the ticketing window as they stand in the queue and their departure once they have made the booking on their own. This indicates the reluctance of the customers to proactively book the ticket before reaching the airport but gaining comfort in transacting close to the booking window to gain assistance if the transaction failed. Thus, the customers desire the mobility benefits of mobile ticketing but also want to minimise the associated risks through organizational cooperation. This highlights the need to view the user perceptions and attitude towards mobile ticketing from their experiences and the interaction between the digital environments and physical reality leading to acceptance of technology in a way that is most suitable for the customers (Hjorth and Pink, 2012).

5.9.2.2 *Theme 2: Perceived ease-of-use or effort expectancy (survey conducted with the staff of the organization to have qualitative inputs)*

The respondents highlighted the motivations of the organisation in designing and marketing their mobile application and the key inputs came from the technology and marketing teams.

Tech32 from the IT department mentioned that the mobile ticketing application was developed with the end user in mind and considering the lower penetration of these services in the country, the users were given detailed instructions on the usability as well as implementation of these services. He also mentioned that the details on use of mobile ticketing have also been provided on the website for the use of this media for ticketing however the penetration remained low in the beginning (Tech32, IT). Mike35 from the marketing team discussed the results of a survey conducted by the organisation on the adoption and acceptance of mobile ticketing by the airline customers. He also added that the airline found that the perceived ease-of-use also depended on the acceptance of services by other people in the society and their respondents mentioned that the use of these services by their social networks impacted their perceptions regarding the efforts needed to learn the new system. Tech25 from the IT department stated that mobile site of the airline is easy to use and very similar to the main website for familiarity and ease-of-use for the customers. He however added that most complaints related to the use of mobile site arise from the drop in the cellular network and incomplete transaction rather than the site itself.

Tech32 from the IT team also mentioned that the mobile site offers a seamless interaction of the customer with the communication channels of the airline to inculcate trust amongst the customers towards the new technology and enable them to carry on their transaction on both platforms. On this Mike35 from the marketing team added that similar graphics and headers have been used to improve the familiarity of the customers with the design and reduce the efforts needed by them to get used to the ticketing media. Addy27 from marketing also highlighted that the mobile ticketing system is being promoted as a faster and convenient mode of ticketing for the end users since it is cost effective for the organisation and improves the mobility of the airline services. This thus targets both the ease-of-use and usefulness of the mobile ticketing media. Mike35 from marketing also mentioned that the penetration of mobile ticketing has grown over the years which indicates acceptance of the users towards the new technology and their improved perception regarding the ease-of-use.

5.9.2.3 *Theme 3: Trust in the mobile technology*

The respondents highlighted the low levels of trust in the mobile technology in general due to issues related to infrastructure and familiarity but also highlighted that the trust has improved over the years and is visible in the form of higher penetration of mobile ticketing to the overall ticketing. Mike35 from the marketing team stated that the customers continue to be sceptical

on the use of mobile ticketing services even though the organisation has worked on the shortfalls in the mobile site and communicated the innovative and additional features to the customers at regular intervals. He further stated that the issues will be common across all mobile commerce service providers since the trust is not just arising from the organisation but all the other participants whose performance matters for the transaction. This includes the individual, mobile device, cellular network, location of the individual while transacting and payment gateway. Sal34 form the sales team also mentioned that the sales resulting from the mobile gateway have improved over time with the better technological infrastructure, both the devices and the network, as well as higher acceptance and comfort of the users with the use of mobile technology. While this has helped gain trust of the customers, this has also enabled the organisation to offer better services to the customers. These responses help explain to an extent the non-significant impact of trust on the attitude towards use of mobile ticketing in Saudi Arabia, since the motivations differ for the customers to try the new technology as was also the finding of Luo et al. (2010) for their research on use of mobile banking.

5.9.2.4   Theme 4: Risk in the use of mobile technology

The respondents accepted the risk in the use of mobile ticketing for the users due to unreliable infrastructure related to mobile technology as well as lack of familiarity of users with the technology and even though improvements have happened, the risk is evident in the high number of complaints received by the airline. Tickie30 from the ticketing department for instance stated that the mobile data connections are not very reliable in the country and many times they get complaints related to the incomplete transactions, which need time for reconciliation with the payment channels like credit cards as well as our internal booking systems. She also added that even though improvements in the process have aimed at ensuring minimum inconvenience to the customers, the customers do not want to risk their transactions and prefer booking though internet website or coming to the ticket counters. Mike35 from marketing stated that the perception of the users towards use of mobile technologies for transactions is improving due to their prior experience with various mobile technology service providers and these positive experiences reduce their perceived risks or cost of failure of trying a new technology. This can explain the insignificant impact of risk in determining the attitude of the users towards the mobile ticketing technology in Saudi Arabia as found in the quantitative survey.

Tech25 from the IT team mentioned that the department has developed a lighter mobile website that is faster than the earlier versions and also offers seamless communication to the customers with the other ticketing modes in the organisation. This has helped improve the traffic through the mobile website, but they also understand that mobile site faces larger issues related to failure due to the dependence on the cellular networks, mobile phones as well as the proficiency of the users in handling the transactions and thus the risk still remains for failed transactions.

5.9.2.5 *Theme 5: Use context in the use of mobile ticketing*

Customers are more inclined to use mobile ticketing when it is most convenient for them. Addy27 from marketing team for instance stated that their survey found that customers are keen on using mobile technology mostly when they are out of their homes or offices and need an urgent booking, but mobile devices are also being extensively used to access the airline site to check details and status. Tech32 from the IT team also indicated that the use of mobile site is highest during the peak hours and is used by the customers for urgent bookings when they possibly do not have the time to wait for their turn in the queue and thus highlighted the importance of context to the use of mobile ticketing by the customers.

Chapter Summary:

The above chapter focuses on the Behavioural Intention and Attitude being dependent variables and trying to reach the conclusion as to which independent factors can be considered in order to study the impact on these wherein they had a correlation of almost 1 between them. Ease of use and usefulness impact attitude but do not play a significant role in the behavioural intention

of Saudi air travellers. On the other hand, mobility and cost play a positive and significant impact on BI. The sample size had considerable young respondents and females, which gave the diversity needed to make meaningful conclusions from the respondents. Young respondents were more likely to take on risks and since we had considerable responses within age group of 26 – 45; risk or trust was not a significant factor on attitude. Through 8 qualitative interviews with the 2 staff members each of 4 different departments, it was clear that mobile technology use by air travellers helped eased the pressure on resources for Saudi Airlines leading them to launch events incentivising travellers to used the mobile website (lighter version of website for mobile) and check the flight status including booking tickets and retrieving existing bookings. Even with the above, two main limitations for the evolution of the mobile ticketing are social influence impact on the attitude and a reliable Internet connection on mobility which has a direct impact on the BI.

6 CHAPTER SIX : Discussion

This section discusses the research findings from the quantitative survey and qualitative interviews, relating them to the hypotheses derived from the research framework as well as past literature on the factors affecting the acceptance of new technology by customers.

6.1 Testing the hypotheses

H1.1: Perceived usefulness of the mobile ticketing services will positively influence the attitude of the consumer towards the technology (U-ATT)

The correlation analysis indicates a moderate positive correlation between the Attitude towards the use of mobile technology for ticketing services and Perceived Usefulness (r=.384, p=.000). The relationship was found to be both positive and significant and thus the relationship between the two variables was established. Even the in-depth interviews suggested the role of relative advantage in the attitude of the customers towards mobile ticketing technology. However to determine the causality of this relationship as in whether perceived usefulness actually caused an improvement in the attitude of the users towards the use of mobile technology for ticketing services, a regression model was developed with Perceived Usefulness as an independent variable and Attitude as the dependent variable. The regression analysis on these models indicate that as the Perceived Usefulness of the mobile technology use for ticketing increases, it will lead to a positive impact on the overall Attitude of the users towards the technology. There were two regression models developed with ATT as a dependent variable and U as independent variables. In the first one where PEOU was also included as an independent variable, the standardised beta coefficient value for perceived usefulness was 0.199 with p = 0.000 and in the second model where SI and PEOU were both included as the other two independent variables, the standardised beta coefficient value for perceived usefulness was 0.146 with p = 0.000. Even though the impact of Usefulness on the overall attitude towards use of mobile technology for ticketing services came down with the inclusion of a third variable, the beta coefficients in both the models were positive and significant with p = 0.000. This indicates that there is a positive impact of Perceived Usefulness on the Attitude towards the use of mobile technology for ticketing services and thus this hypothesis is accepted.

H1.2: Perceived Ease of Use of mobile ticketing services will positively influence the Attitude of the consumer towards the technology (EOU-ATT)

Perceived Ease of Use was found to have a positive and significant correlation with the Attitude towards the use of mobile technology for ticketing services (r = 0.473, p = 0.000), which indicated that an improvement in Perceived Ease Of Use of the technology may lead to an improvement in the positive Attitude towards mobile technology for ticketing services. The

causality of this relationship was determined through the help of regression models created with PEOU as an independent variable and Attitude as a dependent variable. There were two such models where PEOU was included as an independent variable and ATT was a dependent variable. In the first one, Perceived Usefulness was also an independent variable and in the second one, Social Influence was added as the third independent variable. In both the models, the standardized beta coefficients for PEOU were found to be positive and significant indicating a positive causality between PEOU and ATT, which means that a positive change in PEOU will lead to an improvement in the Attitude towards mobile technology for ticketing services. While in the first model PEOU had a standardized beta coefficient of 0.375 and p = 0.000, in the second model where SI got included as a third variable, the beta coefficient value came down to 0.270 with p = 0.000. This indicates that there is a positive and significant influence of PEOU on ATT and thus the hypothesis stating the positive influence of PEOU on ATT is thus accepted.

H1.3: An improvement in the perceived ease of use of mobile ticketing services will positively influence the perceived usefulness of the technology (EOU-U)

TAM suggests that perceived ease of use is an important antecedent for the perceived usefulness of a technology amongst its users. This hypothesis thus has stemmed from an established framework on the acceptance of a new technology by the users. In the in-depth interviews as well, the participants indicated that as the users get more comfortable with the use of mobile technology for ticketing services, its relative advantage over other ticketing media improves due to the other associated benefits and lowered resistance to the new technology. In the quantitative analysis, the corresponding analysis that will help evaluate the hypothesis is the correlation and the regression analysis carried out with the two variables. The correlation analysis between the two values led to a Pearson's r value of 0.493 and p = 0.000 indicating a strong positive and significant correlation between these two variables. This means that a positive change in the perceived ease of use may lead to a positive change in perceived usefulness of the mobile technology use for ticketing services. The research framework and the hypothesis test however requires the determination of a causal relationship between these two variables, where a positive or negative change in perceived ease of use will lead to a positive or negative change in the perceived usefulness of mobile technology for ticketing services. The regression model thus developed with PEOU as an independent variable and Perceived Usefulness as an independent variable led to a standardized beta coefficient value of .640 and

p=.000 indicating a positive and significant causal relationship between PEOU and U indicating that a positive change in PEOU will have a positive and significant improvement in the Perceived Usefulness of the mobile technology use for ticketing services. The correlation analysis as well as the regression analysis shows this relationship to be true. Thus, this hypothesis is accepted for the current research.

H1.4: An improvement in the acceptance of mobile technology in the social network of the users will lead to an improvement in the attitude of the consumer towards the technology (SI-ATT)

The relationship between Social Influence and Attitude towards mobile technology can be tested through correlation and regression analysis. The correlation analysis between the two variables led to a Pearson's coefficient (r) of 0.579 and p = 0.000 indicating a strong positive and significant relation between the two variables. The causality of the relationship was determined though the regression analysis with Social Influence as an independent variable and Attitude as a dependent variable. The regression model also had PEOU and U as the other two independent variables and thus was a variation of the Technology Acceptance Model. The standardized beta coefficient value for SI in the regression model was found to be .439 with p=.000 indicating a strong positive and significant impact of the Social Influence on the attitude of the users towards use of mobile technology for ticketing services. This thus leads to the acceptance of the hypothesis that as the acceptance of technology improves in the social network of the users there will be a positive improvement in the attitude towards the use of mobile technology for ticketing services.

H2.1: An improvement in the perceived ease of use of mobile technology for ticketing services will positively influence the behavioural intention towards the use of mobile technology for ticketing services in Saudi Arabia (EOU-BI)

In UTAUT, Perceived Ease Of Use is cited as one of the factors influencing Behavioural Intention and thus it has also been included in the current research framework. The relationship between PEOU and BI has been analysis through correlation between the two variables and the regression model to evaluate the impact of PEOU on the BI of the users. Correlation analysis for the two variables led to the Pearson's r value of 0.408 and p = 0.000 indicating a strong positive correlation between the two variables which means that an improvement in the

perceived ease of use of mobile technologies for ticketing services will lead to an improvement in the behavioural intention of the users towards the use of the technology. The regression model developed for the variables also included eight other variables (U, PR, UC, T, C, SI, M, CO) and tried to evaluate the cumulative impact of these variables on the BI. The regression model however did not include PEOU as a factor influencing the BI significantly and was thus excluded from the model. Thus, even though the correlation analysis revealed a positive and significant correlation between PEOU and BI, the regression analysis did not include PEOU as a factor that could explain any significant variation in the BI and thus the hypothesis on the positive impact of PEOU leading to an improvement in the BI towards use of mobile technology for ticketing services is thus rejected.

H2.2: Perceived usefulness of the mobile ticketing services will influence the behavioural intention of the consumer towards the technology (U-BI)

Perceived Usefulness has been included in the UTAUT framework as one of the factors influencing the BI of the users towards the new technology. The relationship between these two variables for the use of mobile technology for ticketing services in Saudi Arabia has been evaluated using correlation and regression analysis. The correlation analysis between the two variables with a Pearson's r value of 0.370 and p = 0.000 indicates a strong positive correlation. This means that as the perceived usefulness of the mobile technology improves, it will also lead to an improvement in the behavioural intention of the users towards the use of mobile technology for ticketing services. As per UTAUT, the regression model was developed to determine the causal relationship between U and BI. However instead of all the research variables included in UTAUT, only M,U and C were included in the final regression model, which with an adjusted R-square value of 0.963 could explain 96.3% variation in the BI. For the Usefulness in particular, the standardised coefficient in the final model was 0.316 with p = 0.000. This indicates a positive and significant contribution of perceived usefulness in determining the behavioural intention of users towards the use of mobile technologies for ticketing services in Saudi Arabia. Based on this analysis, the hypothesis of the improvement in perceived usefulness leading to a positive behavioural intention towards use of mobile technologies is accepted.

H2.3: Perceived risk of the mobile ticketing services will influence the behavioural intention of the consumer towards the technology (PR-BI)

The impact of Perceived Risk on the Behavioural Intention of the users of a new technology has been established in UTAUT. This relationship has been evaluated in the current research through a correlation and regression analysis between the two variables. The variable PR has evaluated the perceived lack of risk for the users of mobile technology for ticketing services in Saudi Arabia and thus a positive relation between the two will indicate that as the perceived lack of risk with a technology goes down, it leads to a positive behavioural intention towards the mobile technology for ticketing services. A positive Pearson's r at 0.311 and p = 0.000 indicate that there is a strong positive and significant correlation between the two variables, which means that as the perceived risk comes down, the behavioural intention to use the technology improves. The regression model involving the two variables also included eight other variables, PEOU, U, SI, T, C, M, UC and CO to evaluate the cumulative impact of these variables in explaining the variation in BI. The final regression model however did not include PR as one of the factors influencing BI, which means that PR did not have as significant impact on the BI as other variables included in the research. Thus the hypothesis suggesting the positive impact of lack of perceived risk in improving the behavioural intention of using mobile technology for ticketing services in Saudi Arabia is thus rejected.

H2.4: Perceived user context of the mobile ticketing services will influence the behavioural intention of the consumer towards the technology (UC-BI)

Contextual benefits of using a technology and its impact on the behavioural intention have also been established in UTAUT and thus this relationship was also included in the research framework for the current study. The relationship has been evaluated through correlation and regression analysis. The correlation analysis revealed a Pearson's r at 0.462 with p = 0.000 for this relationship indicating a strong positive and significant relationship between the two variables and means that as the context places higher demands on the use of mobile technology for ticketing services, the behavioural intention towards use of technology will also improve. The regression model was run along with other eight variables that have also been found to influence the BI of the users to determine the impact of each of these variables on the BI. The final regression model however did not include UC as one of the factors that can help determine the variation in the BI values. Thus the hypothesis that Behavioural Intention towards use of mobile technology for ticketing services in Saudi Arabia will improve based on the Contextual Use of these technologies will be rejected

H2.5: Perceived trust of the mobile ticketing services will influence the behavioural intention of the consumer towards the technology (T-BI)

Trust in the ability of the technology to fulfil the objectives of the users the technology has been found to be an important consideration in determining the BI of the users towards the technology. As in case of the UTAUT framework, trust was included as an independent variable in evaluating the factors that influence the BI of the users of mobile technologies. This relationship was evaluated through correlation and regression analysis. Correlation analysis between BI and T revealed a Pearson's r value of 0.418 and p = 0.000 which indicates a strong positive and significant relationship between the two variables. As the Trust in the technology increases, the Behavioural Intention to use the technology will also improve. Trust, however, was also tested along with other variables included in the research framework to determine the ability of Trust to determine the variation in the BI values for the respondents. However, upon regression analysis, the Trust variable was not included in the final research model, indicating the non-significant impact of this factor in determining the overall Behavioural Intention of the users towards use of mobile technology for ticketing services in Saudi Arabia. Thus the hypothesis stating the positive impact of Trust on improving Behavioural Intention of use of mobile technologies for ticketing services in Saudi Arabia is thus rejected.

H2.6: Perceived compatibility of the mobile ticketing services with other mobile technologies will influence the behavioural intention of the consumer towards the technology (C-BI)

Compatibility has also been cited as a key factor influencing the Behavioural Intention of users towards a new technology and for the current study, the impact of Compatibility of the users habit and phones have been evaluated for a relationship with the Behavioural Intention. The correlational analysis for the two variables led to a Pearson's r value of .590 and p=.000 indicating a strong positive and significant correlation between the two variables. This means that the perceived Compatibility of the technology with the other factors that a user is used to affects the generating of positive Behavioural Intention towards the mobile technology. Regression analysis carried out to determine the cumulative impact of factors included in the research framework on the BI led to the development of a regression model that could explain 96.3% variation in the BI values with changes in M, U and C. The standardized beta coefficient value for compatibility in this model was 0.309 with p = 0.000. Thus, the regression model indicated that compatibility has a positive and significant influence on the behavioural intention

of the use of mobile technology for ticketing services. Therefore the hypothesis stating that improvement in Compatibility will lead to improvements in BI of the users towards using the mobile technology for ticketing services in Saudi Arabia is accepted.

H2.7: A higher perceived social influence of the mobile ticketing services will lead to higher levels of the behavioural intention of the users towards the use of mobile technology for ticketing services in Saudi Arabia (SI-BI)

As per UTAUT, Social Influence has a significant role in determining the Behavioural Intention of the users towards a new technology and thus the impact of Social Influence has been tested for its influence on the Behavioural Intention of the users of mobile technology for ticketing services. Correlation and regression analysis have been used for associative and causal analysis between the two variables. Correlation analysis between the two variables led to a Pearson's r value of .501 with p=.000 indicating a strong positive correlation between the two variables. This means that a positive change in the Social Influence towards the use of mobile technology for ticketing services may lead to a positive influence on the Behavioural Intention of the users towards the use of this technology. The regression model developed with Social Influence also included eight other independent variables (PEOU, U, PR, UC, T, C, M and CO) as part of the model developed in line with the UTAUT framework. The final model that resulted from the regression analysis however did not include Social Influence as a significant factor impacting the Behavioural Intention of the users towards mobile technology use for ticketing services. Thus, even though the UTAUT framework suggested SI to influence Behavioural Intention and there was a strong positive correlation between the two variables, the causal relationship between the two could not be established as suggested by UTAUT and this hypothesis is thus rejected.

H2.8: Higher perceived benefits associated with the mobility of the mobile ticketing services will positively influence the behavioural intention of the consumer towards the technology (M-BI)

Mobility is an important consideration for users who opt for mobile technology use for ticketing services and thus has been found to impact the Behavioural Intention of the users as suggested by UTAUT. This relationship has been explored in the current research through a correlation and regression analysis involving the two variables. The Pearson's r value for the

two variables at 0.620 with p = 0.000 indicates a very strong positive correlation between the two variables. This in turn means that an improvement in the perceived benefits associated with the Mobility of mobile technology for ticketing services may develop a positive Behavioural Intention towards using the technology. The causal relationship in turn has been evaluated though a regression equation involving eight other variables, PEOU, U, PR, UC, T, C, SI and CO. The results of the regression analysis led to a model where only three factors finally were included, M, C and CO. The standardized beta coefficient value for Mobility was found to be 0.288 with p = 0.000 indicating a strong positive and significant influence of the perceived benefits of mobility on the Behavioural Intention of the users. The results are thus in agreement with the UTAUT framework for acceptance of a new technology with a causal relationship between Mobility and Behavioural Intention. The beta coefficient value of 0.406 indicates that with every one point improvement in the perceived benefits of Mobility of mobile technology, the Behavioural Intention will improve by .406 points. This hypothesis is thus accepted for the research.

H2.9: A positive perception towards the cost benefit of the mobile ticketing services will positively influence the behavioural intention of the consumer towards the technology (CO-BI)

As per UTAUT, perceived Cost is a major consideration in development of Behavioural Intention of the users towards a new technology. In the current research framework also the impact of perceived Cost has been tested on the Behavioural Intention of the passengers to use mobile technology for ticketing services in Saudi Arabia. This relationship has been analysed with the help of correlation analysis and a regression model developed with Cost as an independent variable and Behavioural Intention as a dependent variable. The correlation analysis between the two variables led to a Pearson's r value of 0.473 and p = 0.000 indicating a strong and significant positive correlation between the two variables. This means that with an improvement in the perceived cost benefit of the use of mobile technology for ticketing, a positive Behavioural Intention towards the mobile technology use will develop. The causal relationship between the two variables has been evaluated through a regression model that has been developed with cost and eight other variables PEOU, U, PR, UC, T, C, SI and M. The results of the regression analysis led to the exclusion of the Cost variable from the final regression equation, which indicates that the perception of the Saudi Arabian consumers

regarding the cost of mobile ticketing services does not significantly impact their Behavioural Intention to use mobile ticketing services. This leads to a rejection of this hypothesis.

6.1.1 Results of hypothesis testing

Table 16 summarises the results of testing the hypotheses in the research study:

Hypothesis accepted	Hypothesis rejected
EOU-ATT	EOU-BI
U-ATT	CO-BI
SI-ATT	PR-BI
EOU-U	SI-BI
C-BI	
M-BI	
U-BI	

Table 16: Results of hypothesis testing

6.2 Addressing the research question

The research has been carried out to determine the factors that influence the acceptance of mobile technology in the use of ticketing services in Saudi Arabia.

The testing of the hypotheses suggests that PEOU, U and SI have a positive influence on the attitude of the users towards the use of mobile technologies and a positive attitude also leads to a positive behavioural intention to use the technology (Venkatesh & Davis, 2000). While the Use Context, Perceived Risk, Perceived Ease Of Use and Compatibility also had a positive and significant correlation with the Behavioural Intention of the users towards using mobile technology for ticketing services in Saudi Arabia, these were not found to have a causal relationship with the Behavioural Intention of the research respondents. Cost, Mobility and Usefulness were the only factors that were found to have a significant positive influence on the Behavioural Intention of the users. Thus while the framework proposed under the technology acceptance model (TAM) was true in this research study, the UTAUT could not be applied in its entirety to the research data.

Luam and Lin (2005) in their research on the Behavioural Intention to use mobile banking systems also found that while TAM explained the attitude of the users in Taiwan towards the

mobile banking technologies, additional measures such as trust, cost and compatibility (referred as self-efficacy) were also important factors affecting the behavioural intention of the users. The findings of this research are also similar to the findings of Luarn and Lin (2005) where, while Ease Of Use, Usefulness and Social Influence were all found to be the determinants of attitude and compatibility, usefulness and mobility were found to be key determinants of the Behavioural Intention of the users towards mobile ticketing. The regression model for the current research suggests Mobility to have the largest impact on the Behavioural Intention to use mobile technologies followed by Compatibility and Usefulness. Wu and Wang (2005) in their research on the acceptance of mobile commerce amongst the users in Taiwan had also found compatibility to have the largest impact on the acceptance of mobile commerce. Compatibility was also mentioned by the airline executives as a key factor for the acceptance of mobile ticketing by the customers since this does not just involve technological compatibility but also compatibility of user habits and the readiness of the organisations in offering mobile ticketing services.

The section below discusses the research findings on the factors that influence the acceptance of mobile ticketing services by the customers in Saudi Arabia.

6.2.1   Ease of use

Ease of use has been found to have a strong positive correlation with the positive attitude of the individuals towards the use of mobile commerce for E-ticketing. Perceived ease of use of a technological system will also be dependent on the proficiency of the user in using the technology and thus only a user who understands the system and knows how to use it will be able to have any intention to use that system. This linkage between perceived ease of use and usefulness of a technology was also witnessed by Venkatesh and Davis (2000) in their research to understand the Technology Acceptance Model and its extensions through inclusion of social influence and other factors related to social influence in their research model.

The findings are also as per the UTAUT model where the convenience of use of technology has been found to play an important role in the behaviour of an individual towards the new technology (Venkatesh & Davis, 2000). The current research found a strong positive correlation of PEOU with all the other research variables as well as a causal relationship with the attitude towards use of mobile ticketing. However, no causal relationship could be

established with the behavioural intention of the users towards mobile technology. Similar to the findings of the current research, Wu and Wang (2005) in their research in Taiwan on the acceptance of mobile commerce also could not find a significant relation between the perceived ease of use and behavioural intention to use the mobile commerce. This could be because irrespective of the ease-of-use of technology, the behavioural intention depends on various other factors that may have a higher influence over the intention of the users than the ease-of-use of the technology.

The acceptance of a new technology has traditionally focused on the basic parameters related to the ease of use and usefulness of technology as the determinant of the attitude towards using a technology and this is category in which technology acceptance frameworks like TAM fall. Riquelme and Rios (2010) in their research found that the acceptance of new technology requires learning and lesser efforts in this regard encourages the users to adopt the technology more enthusiastically, thus building a positive attitude towards the technology. However, the behavioural and psychological aspects focus on the behavioural aspects of the individuals using the technology and thus factors like social influence, trust and riskalso become important (Lu, Yao, & Yu, 2005). In case of the current research for example, perceived ease of use and usefulness of the mobile technology while having a positive and significant correlation with the behavioural intention could not explain the variation in the behavioural intention of the respondents to use the mobile technology and thus had to be excluded from the regression model. This indicates that the users do not give as much importance to the ease-of-use as to the other factors like mobility, cost and compatibility in their adoption of mobile ticketing technologies. This also indicates a more practical approach of the users in their acceptance of technology and their readiness to overlook the ease of use and usefulness in exchange for the lower costs incurred on tickets purchased through mobile ticketing or to enjoy the benefits of mobility offered by the mobile technology. Koufaris (2002) in his research on the online shopping also found a strong role of emotional and cognitive responses on the intention of the users to make a purchase. Thus, while ease of use has a positive influence over the behavioural intention, it does not explain the variation in the behavioural intention of the users of mobile ticketing technologies.

6.2.2   Usefulness

Usefulness is also an important component of TAM as well as UTAUT. The current research found a strong positive correlation between the perceived usefulness of the mobile commerce for E-ticketing and the attitude of potential users towards the technology. This relationship has been well established across various technologies including the earlier adoption of computing technologies in the workplaces (Venkatesh, Morris, Davis, & Davis, 2003). This is due to the direct connection between the perceived usefulness and the impact on the productivity of the employees. In a more recent research, Yang and Fang (2004) in a research study on the perceived usefulness of the mobile commerce by the users in Singapore found a positive correlation between the perceived usefulness and behavioural intentions to adopt the new technologies. Mobile ticketing allows the users to purchase the tickets as per their convenience, in the quantity desired and quickly. In the current research, however, only 50% of the users found the mobile ticketing to be either faster or useful than physical ticketing. A deeper analysis reveals that the usefulness is also positively and significantly correlated with the perceived reliability of the mobile phone and the mobile network in enabling the customers to complete their transactions. Thus, the usefulness of mobile ticketing is also dependent on the kind of infrastructure available with the customers to use these services.

Lu et al (2005) in their research on the role of social influence and personal traits such as innovativeness on the perceptual belief towards wireless internet services found that the perceptual beliefs such as perceived ease of use and usefulness had a significant impact on the intentions of the users to adopt the new technology. In case of current research however, even though these perceptual beliefs affected the attitude of the users towards the technology, it did not have any significant role to play in the intention of usage. This could be because of the difference between the two product types where in one case it is the use of technology to enjoy the benefits of another technology and in the other the technology is being used to actually make a purchase. Use of mobile internet technology to access wireless internet services involves the interface with few key telecom firms in a given market, while to use mobile commerce for purchasing tickets, there are several players (web portals, airlines, banks, credit card companies...) involved in ensuring that the transactions are successful and this increases the perceived risks and costs associated with the adoption of this technology.

6.2.3   Risk

While the current research found a positive impact of lower perceived risk on the behavioural intention of the users of mobile technology, Wu and Wang (2005) in their research found that when the perceived risk increased, the behavioural intention to use also increased. This was a contradiction since it is expected that with an increase in risk, people will move away from the use of that technology due to the potential losses. These authors had explained this positive correlation between perceived risk and behavioural intention to the increased usage of mobile commerce by Taiwanese users and an understanding amongst the customers that even though there exists a risk for failure in the form of delayed or failed deliveries and payment system not being secure, the users are still using the mobile commerce platforms to enjoy the consumer deals that are made possible by these platforms. Thus, even though the perceived risk is higher, the users have an intention of using the technology to benefit from the varied offers available there. In case of current research, the questions were framed to evaluate the impact of a low risk situation on the behavioural intention of the users and the positive correlation shows that a lower perceived risk leads to a positive intention to use the mobile technology. This is also a relationship suggested by UTAUT as well as included in the research framework.

Luo et al. (2010) also in their research found that perceived risk plays an important role in the acceptance of innovative technologies. Risk and credibility were also found to be most importance influencing factors in a study conducted by Fadli Fizari and Daud (2011). These researchers also found that any reduction in the perceived associated risks will improve the adoption rate of new technologies by the users. The current study also found a strong positive correlation between the perceived risk associated with the mobile E-ticketing and the positive attitude of the respondents. The UTAUT model also suggested the influence of trust and privacy on the behaviour of the individuals (Venkatesh, Morris, Davis, & Davis, 2003). The risks associated with the mobile commerce have been found to be associated with the fraud and leakage of the user information due to its access by unverified sources. An individual may not always be able to assess the risks associated with a mobile or web application and thus a person with lesser confidence on the legitimacy of an application will have a higher perception of the risk, which will reduce their acceptance of the new technology. Mallat et al. (2006) also found that acceptance of mobile payment differs from the acceptance and adoption of other technologies due to the higher perceived risks associated with these technologies. The authors also found that mobile technology may be enforced upon the users due to the lack of options

and task urgency for the users and thus even though perceived risk is higher, the users will adopt mobile technology in spite of it. Thus, since in case of mobile ticketing, the users have other options of purchasing their tickets where the perceived risks are lower, they might be reluctant to move to a high risk option. However, as mentioned by the airline executives, the incentives provided to the customers improve their relative advantage of the use of mobile ticketing option and this possibly incentivises them to take a risk of trying a new technology for their ticketing needs.

6.2.4   Use Context

The research also found that the context of usage has a positive and significant correlation with the attitude of the consumers towards the mobile technologies. Mobile application firms or those with a mobile commerce platform will aim for being the first choice of purchase for the consumers due to the possible benefits to the productivity of their system and the enhanced visibility of the business in the mobility space. The research found that almost 80% of consumers opt for mobile commerce when they are in a hurry and 63% use it when the purchase was not planned and was rather unexpected for them. Moreover, 50% of the users will opt for mobile commerce when they do not have cash and almost 43% will opt if their travelcard is not working. These results also indicate the perception of the consumers about the mobile applications and their ability to provide them a quick and convenient service.

6.2.5   Trust

Lower awareness levels on a new technology will prevent the users from developing a trust in the capability of the system to provide the promised benefits (Pikkarainen, 2004). The current research also found a positive and significant correlation between the trust on the technology and the attitude of the users towards the adoption of the new technology. Trust of the consumers on the technology has been found to be related to the satisfaction of the consumers and their future usage of that technology (Jain, 2013). Howcroft et al. (2002) also found that trusting of a technology is an important factor in developing positive behavioural intentions towards the technology. The current research found that only 30% of the respondents find the mobile ticketing agents in Saudi Arabia to be trustworthy while 53% perceive their mobile intermediaries or operators to be trustworthy. On similar lines, only 27% of the respondents found the mobile ticketing agents operating in Saudi Arabia to be competent and capable, while

48% found their mobile operator to be competent and capable. Li (2011) in a research on the adoption of mobile banking technology also found that the trust of the users in a technology is built over time and the attitude of the customers towards the technology varies between the potential and repeat customers of a technology. Goswami and Ravindran (2009) in their research found a significant difference in the perception of the users regarding the trustworthiness of a mobile technology based on the maturity of the market. As the potential uses of a technology increase in their scope, more users are expected to adopt the new technology.

Lee and Chung (2009) in their research on the acceptance of mobile banking technology in Korea found that the trust of the consumers on a technology is influenced by the quality of system and information available on the technology. In case of mobile ticketing as reviewed through the literature on the subject, there are multiple agencies involved and this has implications on the quality of experience that can be offered to the users of mobile ticketing services. It is not just the technology alone but the middlemen, ticket issuing agencies, payment gateways and the telecom players who play an important role in enhancing the quality of experience for the customers and thus lead to the development of trust and satisfaction towards the technology.

6.2.6   Compatibility

Compatibility of technology with the lifestyle and habits of the users influences the acceptance of a technology by the users and the research findings also point to compatibility being a key determinant of the intention of the users to adapt mobile ticketing technology. Wu and Wang (2005) in their research on understanding the factors responsible for the acceptance of mobile commerce found that compatibility had the most significant influence on the on acceptance of mobile commerce. As discussed above, the behaviour of the customers in general with technology and the use of technology in varied phases of their life will determine the usefulness of a technology to them. In situations where this behaviour is compatible with the behaviour expected by a new technology, there will be higher chances of acceptance of the new technology. These findings also fit with the UTAUT model where compatibility was found to be one of the determinants of the behavioural intention of the users of a new technology.

6.2.7 Social Influence

Social influence was found to have a positive and strong correlation with the attitude towards adoption of new technology. 55% of users agree that the use of mobile commerce makes them appear ahead of others in adoption of technology, while 63% perceive the mobile commerce to be trendy. 40% of the respondents perceived the use of mobile commerce as a source of additional respect in their social group.

Lu et al. (2005) found that besides the personal motivation in adopting new technologies, individuals also adopt innovative technologies under the influence of others in their social group. The authors found a strong causal relationship between the adoption intention of individuals and their social influences. Similar findings were also uncovered by Wu and Wang (2004) who found the social influence of an individual to play an important role in building up of their attitude towards the innovative technologies.

Social influence has also been found to be important for generation of trust amongst the user base (Liu, Min, & Ji, 2009), which in turn has been found to be significantly related to the satisfaction of the users with the new technology.

While TAM did not consider the importance of social factors in acceptance of technology, these have been included in UTAUT. The current research also finds a strong positive and significant link between the perceived social influence and the attitude of the users towards the new technologies. The cultural trait of not allowing women to travel alone or without permission also has impact on the number of travellers and the use of the technology, this is something the researcher would explore as a separate work in the future.

6.2.8 Mobility

The infrastructure of the mobile technology has improved in KSA. The technology has become more affordable over the years and this has led to several service providers offering their services through mobile commerce to enable the customers to enjoy these services on-the-go. Mobile commerce such as ticketing services provide the benefit of mobility and related convenience to the users and by this logic a higher perceived benefit from mobility should lead to a higher behavioural intention to use the mobile technology. The results also confirm the

same since mobility was found to be a key determinant of the behavioural intention of the respondents to use mobile ticketing services. The research also found a strong positive and significant correlation between the perceived mobility benefits of mobile commerce and the attitude of the respondents towards the use of mobile commerce. 73% of the users perceive that mobile commerce has the ability to reduce the time spent in queues and thus resolves their queuing issues, while 73% and 68% feel that mobile ticketing is not dependent on place or time and thus gives them mobility benefits. Almost 77% of the respondents also find the lack of need to carry any cash or card while using mobile commerce for their transactions and thus gives them mobility benefits. Mobility can also be clubbed under the convenience offered by the mobile commerce to the users, but Mallat et al (2006) through their research findings suggested the inclusion of mobility of a technology in the user acceptance models of new mobile technologies. The authors suggested that mobility as a feature provides unique benefits in adoption of mobile technologies, which is not a case with the other technologies.

Similar findings have also been seen in the work of Huang et al. (2007) who in their research on the use of mobile technology for M-Learning found that mobility had a major role in play in explaining the intention of the users towards acceptance of this technology, besides the perceived enjoyment of the users. An interesting finding of Huang et al (2007) was that the differences in the perceived benefits of mobility also explained variation in the behavioural intention of the users to adopt mobile technology. This means that users who are more mobile will be more inclined to use mobile technologies and this also sits well with the ticketing services since a lot of people tend to buy the tickets at the last moment (Saxton, 2001) and being mobile provides them with a platform that can help them buy tickets while on the move.

While mobility is a key feature of use of mobile technology in enjoying the services offered on a mobile platform, it actually stands for the extended benefits offered in terms of the convenience, speed and timely delivery of the services availed on this platform (Seppa¨la¨ & Alama¨ki, 2003). Thus, in case of the current research when mobility has been found to play a significant role in the variation in the behavioural intention of the users towards using mobile technology for ticketing services, this is indicative of the potential benefits of convenience and saving of time as discussed earlier as well.

6.2.9   Cost

The perceived cost benefits of mobile commerce were found to have a positive influence on the acceptance of mobile technology by the respondents. However, only 27% find mobile ticketing to be inexpensive, while 38% found mobile tickets to be reasonably priced. Almost 42% perceive mobile ticketing to be ideal for purchase of single tickets. Cost has been found to be an important determinant of intention of the consumer to adopt a new technology (Venkatesh & Davis, A theoretical extension of the technology acceptance model: four longitudinal field studies, 2000). The research has addressed the cost of the users from two perspectives, direct cost of the ticket and the cost of their effort. Respondents perceive a higher cost benefit when they opt for mobile commerce to purchase single tickets since they need to otherwise make an effort to purchase physical ticket and thus develop a positive attitude towards mobile commerce when the efforts for physical purchase are not commensurate with the quantity purchased through physical channel. Higher costs as a deterrent to use of mobile technologies and lowering the overall costs for the users to improve the acceptance of mobile technology amongst the users has also been emphasized by Mallat et al. (2006). This finding has implications for the mobile ticketing service providers in Saudi Arabia where to improve the adoption of this technology amongst the mobile users an additional discount can be offered to the customers for making a purchase through this channel.

6.2.10 Attitude

TAM suggests PEOU and PU to be the key determinants of the attitude of a user towards a new technology and the current research also confirmed the findings of the TAM model. Social influence was also included in the conceptual model as a determinant of the attitude of the users towards mobile ticketing services. The research found the causal relationships to be true and the attitude of the Saudi Arabian towards mobile ticketing can be determined through their perceived ease of use, usefulness as well as social influence. Also, attitude was found to have very high causal relationship with behavioural intention where the attitude of the users towards the mobile ticketing services is a strong determinant of the behavioural intention to use mobile ticketing services.

6.2.11 Demographic variables

6.2.11.1 Age

6.2.11.2 Liébana-Cabanillas et al **(2014)** in their research on the moderating effect of age on the participants on the relationship between ease of use and perceived trust in the system and trust and favourable attitude towards the system found a significant difference in these relations across the various age groups. Ease of use and trust were more important for the older people than for the youngsters. The current research however could not find any significant difference in the behavioural intention of the Saudi Arabian consumers towards use of mobile ticketing services. ***Education***

Medhi et al. (2009) in their research on the impact of education on the perceived usefulness and ease of use of mobile technologies found that literacy brings a positive change in the acceptance and adoption of new mobile technologies. The current research however did not find any significant difference in the research variables across the educational qualifications. This could be because only a very small sample was qualified at high school level while all others were at least graduates and thus were literate enough to be positively oriented towards mobile technology. Also, while none of the variables differed significantly across educational qualifications, high school educated respondents did indicate lower trust levels towards the use of mobile ticketing services compared with Univeristy graduates (?), even though all the other variables did not form any pattern in the differences across education levels.

6.2.11.3 Gender

As per UTAUT, males will be more concerned with the performance of a technology due to their higher orientation towards the task while the females will be more influenced by the effort required to accept the new technology rather than its perceived performance-related benefits. The same has been confirmed by research studies on internet banking (Lichtenstein & Williamson, 2006), online shopping (Van Slyke, Belanger, & Comunale, 2004) and use of e-mail (Gefen & Straub, 2000). Riquelme and Rios (2010) in their research on the acceptance of mobile banking across the two gender groups also found that ease of use is more important for the females than for the males, but the males are more influenced by the relative contextual benefits of mobile use over physical efforts. Males were also found to be more influenced by

the perceived usefulness rather than the ease of use of the mobile technologies. The current research, however, did not find any significant difference between the genders in their perceived ease of use of mobile technologies. A comparison of all the research variables across the two genders suggests that none of the variables differ significantly across the two genders but trust and social influence was found to be higher in case of males than females even though it can only be suggested at a confidence level of 80%. Riquelme and Rios (2010) on the other hand found that social influence played a higher role in the adoption and attitude of females than in case of male candidates. The difference could be because of the cultural factors and Saudi Arabian society being more collectivistic and thus higher likelihood of males to trust and be influenced socially by an innovative technology. .

Park et al. (2007) in their research found performance to be the most important factor influencing the acceptance of a new technology for the males while for the females, social influence was found to have a much larger impact on their attitude towards the technology than the performance. In fact, the researchers found that performance had no influence on the attitude of females towards acceptance of new technology. Another important finding in their research was the importance of facilitating conditions for their attitude towards the new technologies for both the genders. In the current research however no significant difference in the attitude of males and females towards the mobile ticketing could be found.

7 CHAPTER SEVEN: CONCLUSION

This chapter aims at concluding the research and is based on the preceding chapters that covered the results, analysis and the discussion of the research findings. The research aimed at evaluating the attitude and behavioural intention of airline travellers in Saudi Arabia towards the use of mobile ticketing services. Mobile ticketing services are encouraged by airlines to make their ticketing process more effective and convenient through availability of ticketing information and services in a ubiquitous manner (Jelassi & Enders, 2005). The travellers or buyers of airline ticketing services however may not be aligned with the expectations of the airlines regarding the perceived benefits of mobile ticketing services due to factors that affect their attitude and behaviour towards using this technology (Choi et al., 2008). While theoretical frameworks have been developed to explain the phenomenon of innovative technology adoption, these frameworks need to be contextually applied to identify whether the causal relationships between the attitude, behavioural intention and their determinants remain true across varied contexts (McFarland & Hamilton, 2006). Through the identification of these relationships, marketers such as the airlines and mobile ticketing firms can develop strategies to influence the attitude and behavioural intention of users towards using mobile ticketing services. A conceptual framework was developed as part of this research in which relationships between the research variables were established to be tested through the quantitative research as well as the qualitative research carried out in the form of interviews with the airlines staff. Based on the research findings, a research framework depicting the relationships between the research variables has been established in the sections below. These also cover the contribution of the research findings to the existing research and theory on the subject as well as its implications for the managers of airline firms and ticketing companies based in Saudi Arabia and other countries. This chapter also covers the limitations of this research and the possibilities for further research on the subject.

7.1 Key findings and research framework

Before discussing the research framework developed based on the research findings, the values of the research variables need to be highlighted. The research found positive perceptions regarding the benefits of mobile technology in terms of perceived ease of use (Mean = 3.85), usefulness (Mean = 3.8), perceived lower risk (Mean = 3.38), use context (Mean = 3.56), trust (Mean = 3.13), cost (Mean = 3.65), social influence (Mean = 3.44), mobility (Mean = 3.69),

compatibility (Mean = 3.10), attitude (Mean = 3.66) and behavioural intention (Mean = 3.61). The values were determined on a Likert scare of 1 to 5 with 1 being strong disagreement and 5 being strong agreement. The values thus indicate that the airline users in Saudi Arabia carry positive perceptions regarding use of mobile ticketing technology with only variation in the behavioural intention coming due to the impact of social influence, perceived compatibility, perceived mobility benefits and perceived usefulness.

7.1.1 Research framework based on the research findings

Based on the findings of the research, the following research framework is suggested for the adoption of mobile ticketing services in Saudi Arabia:
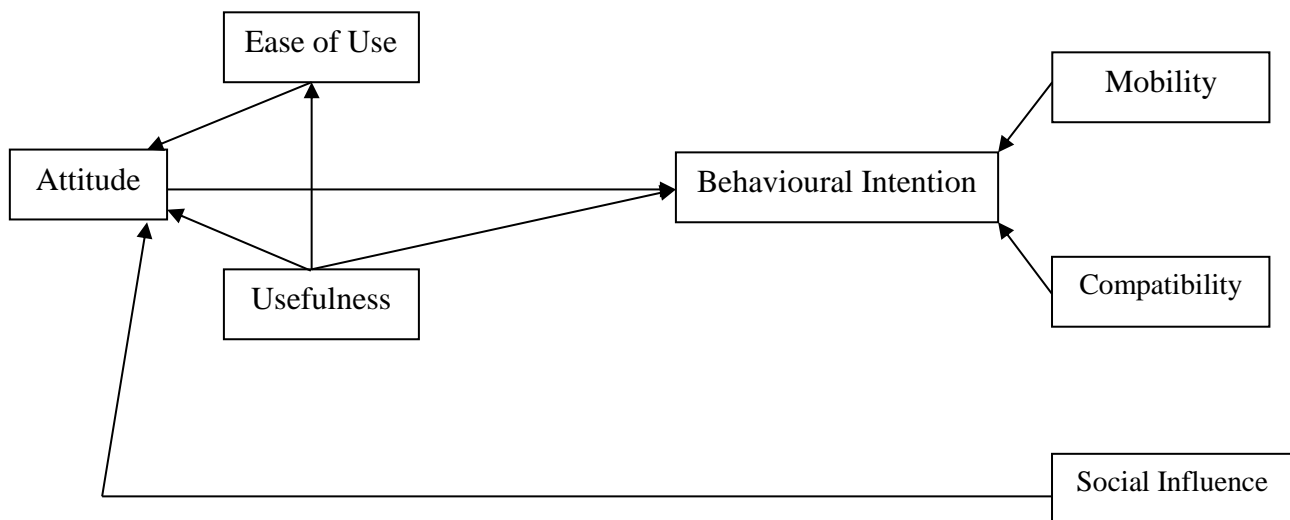
Figure 18: Research Framework based on research findings

In terms of the relationships between the variables, the following section describes the research framework based on the research findings.

The first key finding relevant for the research framework is for the relationships contained in the theoretical frameworks suggested by various technology adoption models. The findings indicate that while the causal relationships as expected under the technology acceptance model (TAM) (Venkatesh & Davis, 2000) were true for the adoption of mobile ticketing services in Saudi Arabia, the variables included as part of (UTAUT) (Venkatesh et al., 2003) did not

contribute as expected to the behavioural intention of the airline travellers towards use of mobile ticketing services.

The second key finding of the research was in relation to the determinants of the attitude of the airline travellers in Saudi Arabia towards mobile ticketing services, which were found to be their perceived ease of use, usefulness and perceived social influence on their actions. Moreover, the behavioural intention, which is a strong indicator of their actual use of technology, was also found to be strongly determined by the attitude of the users towards using mobile technology for ticketing services.

The third key finding was related to the behavioural intention separately, which was also found to be significantly influenced by the perceptions of the users regarding the mobility benefits, compatibility with other technologies and devices available to the users as well as perceived usefulness.

This thus presents a framework that can be used by marketers or airline companies in promoting mobile ticketing services to their travellers. Any application developed as part of the mobile ticketing platform needs to be perceived as easy to use, useful and as being used by other members of the society to develop a positive attitude towards the technology. The variations in the behavioural intention of the travellers towards the technology are also not as significantly influenced by factors such as trust, cost, use context and perceived risk as is due to the variations in the perceived compatibility, usefulness and mobility. This indicates that the marketers or airline firms need to focus on improving the compatibility of the mobile ticketing process with the existing ticketing process as well as technological infrastructure available with the consumers in Saudi Arabia. Moreover, mobility is a key determinant of behavioural intention and this means that mobile ticketing platform is more likely to be used for its perceived mobility benefits than as a standard ticketing platform. Thus, if the airline or ticketing firms intend to increase the use of their mobile ticketing platforms, they need to consider the users who are more mobile and thus need to use this ticketing platform. From the research framework thus the key influencers of the use of mobile technology for ticketing services are the perceived ease of use, usefulness, social influence, perceived mobility benefits and perceived compatibility.

The behavioural intention to use mobile ticketing technology was however not found to be significantly different across various demographic groups based on the age, gender and education levels of the consumers and thus the airline and ticketing firms need not differentiate their mobile ticketing platforms and related marketing activities for the various demographic segments using the platform(however, the caveat is that the country if very young but it still has considerable older age group people that were not necessarily available during the time of surveys but may require assistance and training or a lite version of technology to feel confident in using m-ticketing. These findings are different from the past research on the adoption of technological models that suggest higher acceptance of innovative technologies amongst males than females (Park et al., 2007) and young consumers to be more likely to adopt innovative technologies (Liébana-Cabanillas et al., 2014). The reasons as discussed in the earlier chapter can be attributed to the exposure of the mobile consumers towards use of mobile commerce and thus leading to increase usage of m-ticketing too as side-effect.

7.2   Research contribution

Saudi Arabia has high mobile penetration with nearly double the number of mobile subscriptions than the inhabitants and this makes the country an ideal setting for mobile applications that can not only increase the convenience for the customers but can also improve the effectiveness and efficiency of the services offered by the various organisations. The research identified positive attitude and high behavioural intention to use mobile commerce amongst Saudi Arabian air travellers, which indicates their acceptance of this innovative technology. The research framework described above has also highlighted the relationships between the various research variables that would be of significance for both the academicians and the practitioners interested in using mobile commerce for marketing activities in Saudi Arabia. The sections below describe the contribution of the research to the existing theory on technology and mobile technology adoption as well as for the managers involved or interested in using mobile commerce in their business.

7.2.1   Contribution to existing research and theory

The research has added to the existing knowledge and theories related to the adoption of mobile commerce by the consumers with specific context of Saudi Arabian consumers. Thus in a way the research has added to the knowledge available on the determinants of acceptance of

innovative technologies by the consumers in Saudi Arabia and other countries in a similar context. Several theories related to the variables influencing the adoption of innovative technologies have been formed including technology acceptance models, UTAUT, innovation-diffusion theories etc. and these have also been empirically tested in varied contexts for their validity. This research also aimed at validating the relationships defined by these theoretical frameworks and applied them to develop a conceptual framework that could be used to evaluate the adoption of mobile ticketing services in the airline industry in Saudi Arabia. The findings of the research are not entirely as per the relationships defined by the past technology adoption models and thus the unique findings in the context of mobile technology use amongst air travellers in Saudi Arabia have contributed to the development of mobile technology adoption framework across the globe.

The first contribution of the research to the existing theory is related to the empirical evidence on the applicability of technology adoption models to the adoption of mobile ticketing services in the airline industry in Saudi Arabia. The research found that technology acceptance model (TAM) (Venkatesh & Davis, 2000) can be extended to the mobile commerce technology in Saudi Arabia since perceived ease of use and perceived usefulness were found to be key influencers of the attitude of the users towards mobile ticketing services. However, unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003) could not be extended to the mobile technology users in Saudi Arabia, since variables such as cost, trust, perceived risk and use context were not found to significantly determine the behavioural intention of the users towards mobile ticketing services. However, qualitative interviews did indicate use context to be determining the use of mobile ticketing services by the airline travellers. The framework however could not be empirically validated through the quantitative research. In the context of the positive perception of the airline travellers towards the use of mobile ticketing services, these findings suggest that in an environment of high acceptance of an innovative technology, all the variables may not collectively determine the variation in behavioural intention but only some variables, such as mobility, compatibility, usefulness, social influence and attitude in this research may determine their intention to use the new technology. The findings are helping move the theory forward wherein researcher has highlighted additional factors that were not considered by the above theories as they came into existence few decades ago; using these additional factors or a consideration of using these factors can help a researcher experiment with all the potential factors that might have an

influence on the BI or attitudes in the middle-eastern continent. The power of the additional factors in existing theories is potentially immense as it can help in capturing the cultural, social and infrastructural influences in all countries within the continent and also potentially making it widely acceptable in Arabic countries particularly gulf countries.

The second key contribution of the research is to the use of mobile ticketing technology in the airline industry and its evolution over a period of time. In case of Saudi Arabia in particular, factors such as trust, cost, perceived risk and use context were not found to significantly influence the behavioural intention of the users towards mobile ticketing technology and this could be because of the evolution of the technology and perceptions of the users over a period of time. TAM and UTAUT were developed couple of decades ago when the consumers were getting used to using electronic technology as part of their daily lives, but over a period of time the technological evolution has improved the acceptance of innovative technologies (Bouwman & Van de Wijngaert, 2009) as well as their perceived safety and security for the users (Luo et al., 2010). Thus, while the research found perceived usefulness, social influence, mobility, compatibility and perceived ease of use to be affecting the behavioural intention of the users towards mobile ticketing services, no significant influence of demographic features or other variables could be found for Saudi Arabian airline travellers. Existence and use of technology, specifically mobile technology for commerce has evolved over the last few years and the users have also become more comfortable and trusting in their use of the technology (Marett et al., 2015).

The third key contribution is to the acceptance of mobile commerce in Saudi Arabia. The research identified that The existing research on adoption of innovative technologies also indicates significant variation in the attitude and behavioural intention of the users on the basis of their demographic features however this research could not identify a variation based on the age, gender or education levels. This could be due to the higher acceptance of a technology that has been existing in the country for last few years. These findings are different from those of Riquelme and Rio (2010) and Park et al. (2007) who had found social influence to be more important for females, while males were more driven by the performance related factors. The current research however did not find any significant difference in the research variable across the two genders. This could be because of the profile of the respondents participating in the research being airline travellers and those who could access internet to participate in the survey, which indicates their access and appetite towards use of technology. Similarly in terms of

education, since most of the respondents who participated in the research were at least graduate (83%) and penetration levels of mobile technology in the country are high (183%).

The initial framework used was amalgamation of UTAUT and TAM theories helping set the precedent of the factors that were used in qualitative and quantitative research. The surveys and interview with the staff helped in slimming the framework as testing them with the quantitative techniques, the researcher was able to arrive at the four significant factors as opposed to seven initially making the framework more effective by using explanatory power of factors on the dependent variables BI and Attitude.

7.2.2 Managerial contribution and implication

The research highlighted various aspects of consumer behaviour that need to be considered by the airline managers and managers of the ticketing services firm in designing and implementing their mobile ticketing processes in Saudi Arabia. The factors identified through the research process have highlighted the drivers that need to be considered by these managers to promote the use of mobile ticketing services by the travellers in Saudi Arabia and gain benefits through higher effectiveness, efficiency and integration of ticketing services at the consumer end.

The first implication is related to the general attitude and behavioural intention of the air travellers in Saudi Arabia towards mobile ticketing services. A Likert Scale of 1 to 5 was used to evaluate the perceptions of the respondents regarding the research variables and both attitude and behavioural intention received an overall value of 3.66 and 3.61 respectively, which indicates that the air travellers who participated in the research carry a positive perception regarding the mobile ticketing services. This indicates that the managers of the airlines and ticketing firms in Saudi Arabia should be encouraged to launch mobile ticketing services with a high likelihood of success in its adoption by their customers.

The second implication relates to the drivers behind the attitude of the users towards the use of mobile ticketing services. The research found that perceived ease of use, usefulness and social influence were all significant determinants of the attitude of the airline travellers towards mobile ticketing services in Saudi Arabia. The regression model developed with these variables was also able to explain 39.6% variation in the attitude of the users towards mobile ticketing services. The managers of mobile ticketing and airline firms can thus to an extent improve the

attitude of the users towards mobile ticketing services through an improvement in the perceived ease of use, usefulness as well as through improvement in the social influence by ensuring positive experience and reviews related to the mobile ticketing services in Saudi Arabia. However, these variables alone are only able to explain around forty percent of the variation in the attitude of the users, which means that there are also other factors that need to be identified that are contributing towards this attitude.

The third implication is related to the behavioral intention of the users towards mobile ticketing services and the research found that attitude could explain almost all the behavioral intention to use mobile ticketing services. This indicates that through a change in the attitude of the users towards use of mobile ticketing services, the behavioral intention of the users towards these services can be improved. Apart from attitude, the other factors that contributed to the behavioral intention included the perception of the users towards benefits related to mobility, usefulness and social influence.

The following are the practical ways in which a corporate can influence the Behaviour or the attitude of travellers.

1. Prize draws incentivising people to use the mobile system login and updating details
2. Three automatic reminder for timings of the flight (24 hours, 6 hours and 3 hours before scheduled departures) so that the traveller has least chance of confusing the flight times and dates.
3. Making check-in process easier only for hand baggage passengers letting them express board the flight shaving off waiting times in the queue.
4. Auto-updates on gate or terminal changes for bigger airports
5. Cash-back or discounts with selected retailers in the shopping area of the airport
6. Advertising mobile website/apps in VIP lounges, as the announcements are never made in the lounge.
7. Linking the bar code on the checked-in luggage to be tracked on mobile in case of lost baggage issues.
8. Updating on the scheduled flight status
9. Having boarding bar code within the mobile would get rid of chances of losing a physical print out and is also environment friendly

7.3   Research limitations

The limitations of the research are related to its methodology and research design. The first limitation of the research is its design as a cross-sectional research, where data was only collected during a limited period of time and thus the research variables including the behavioural intention of the respondents towards use of mobile ticketing could only be determined at a given point in time. Longitudinal research on the other hand could have helped determine the change in the attitude or behavioural intention with the repeated use of the mobile application (Creswell, 2013). The cross-sectional research design however also assumes that all the travelers have used it equal number of times and thus the variation is only due to the variables included in the conceptual framework, but that might not be the case since those users who have had higher exposure to the particular application would have varied perceptions than those who have either scarcely or never used it before (Komiak & Benbasat, 2006).

The second limitation is related to the data collection strategy being the online survey strategy (wherein the respondents who were busy or about to catch flights have an option to respond later on when they have few minutes whilst waiting for a take-off or once they have access to the survey link at home or in office). Since an online survey strategy was used for collecting research data from airline travelers, the limitations related to the use of online surveys in a research also become the limitation of this research. This includes limitation in terms of lower control of researcher on the data collection process as well as lower validity of the findings since the researcher is not physically present while the survey is being undertaken by the respondents and they may not be able to clarify their queries (Saunders et al., 2009).

The third limitation is due to the deductive design of the research where the variables were largely included from the available theoretical frameworks that focus on the reasons for adoption of new technology and even though the technology adoption models provide frameworks that explain the adoption process of innovative technologies, the inhibitors may include factors beyond these frameworks (Cenfetelli, 2004). The research however could not identify these factors since the consumer survey was designed as quantitative survey based on the theoretical frameworks available through the past literature. The results of the regression model also explain almost 96.3% of variation in the behavioural intention but this also indicates

that there is a possibility of some more variables to be identified that are influencing the behavioural intention of the users towards use of mobile ticketing services, but have not been identified for inclusion in the research.

The fourth limitation is related to the limited scope of the research since the research was contextual and thus the findings might be limited to the Saudi Arabian air travel industry and thus the findings cannot be generalized to other contexts such as other countries or other industries and even though some of the findings may apply to those contexts as well, generalization of the results cannot be made.

The fifth limitation is the number of respondents which was at 207 versus an ambitious target of 750-800 at the start of the research; although the eventual respondents were only 25% of the initial target; researcher believes that the conclusion would not have been considerably different and would have received results with similar bigger picture and have more confidence in concluding the results. Also, on the other hand too many respondents might have lead to too much quantitative analysis, which is good but can lead to missing a holistic view.

7.4   Possibilities for further research

In terms of the further possibilities of research on the subject, changes in the research methodology as well as scope of the research can be made to add to the knowledge generated through this research.

This research only focused on the acceptance of mobile ticketing services in Saudi Arabian air travel industry, but the scope can be increased in future research to include other countries in the region or other industries where research on mobile ticketing can be used to identify features that might be peculiar to the country or to the consumer behaviour in the industry to develop more generalist models related to the acceptance of mobile commerce. Comparative evaluation can also be done to include contextual factors such as social and cultural differences across countries as a source of varied acceptance of mobile commerce across countries.

Within the context of the Saudi Arabia airline industry, future research can also be designed as inductive research to identify factors that may not be included in the past technology acceptance models through in-depth enquiries on the behaviour of the airline consumers

towards use of mobile commerce for their ticketing requirements. Such a deeper evaluation will help identify not just the motivators towards using mobile ticketing services but also identify reasons why people may not be using these services. The interviews with the airline personnel for instance revealed that the customers still find physical ticket purchase at the counter to be more convenient and only shift to mobile ticketing in case their perceived convenience is higher for the mobile ticketing due to say a large queue. Such situations can be explored in detail through in-depth interviews with the airline customers to identify means through which their acceptance of the mobile technology can be further improved.

Detailed evaluations can also include telecom service providers and mobile payment gateways to identify key features of their customers and the difficulties faced by their customers in using mobile commerce for their ticketing or other shopping needs to identify factors that might be hindering the adoption of mobile commerce amongst airline customers.

The research can also be carried out as a longitudinal research with a selected group of customers who have indicated lower levels of behavioural intention to use mobile ticketing services and the reasons for these inhibitions can be deeply evaluated. Another strategy for these groups of customers could be the experimentation strategy where the improvements in the mobile commerce infrastructure can be tracked for the improvements in the behavioural intention of the users towards the technology.

7.5   Conclusion

This chapter has concluded the research in terms of the key findings of the research and their implications for both the academicians as well as practitioners of mobile commerce. The chapter has collated the key findings of the research to develop the research framework and evaluate the relationships between the research variables to carry out a comparison with the conceptual framework that was developed based on the past literature review. The research has been concluded to state that the framework developed based on the research is different from the one suggested based on the literature review, which indicates that the Saudi Arabian air travelers in their evaluation and adoption of mobile commerce for ticketing services do not follow typical technology adoption behaviour. While their attitude towards technology could be determined based on technology adoption models, their behavioural intention was more significantly determined by the perceived usefulness, compatibility and mobility, while

indicating a non-significant contribution of cost, trust, perceived risk and use context to their behavioural intention towards mobile ticketing services. This chapter also concluded that the research also had some limitations due to the research design and scope and this can be improved in the future through an increase in the scope of research by including more countries and industries to enable development of a more generalistic research framework for mobile commerce. The limitations however also lead to identification of further research possibilities in the research design by carrying out the research as a detailed inquiry with the customers as well as other stakeholders of the mobile commerce technology such as the telecom firms and payment gateways. Research can also be designed as a longitudinal research to evaluate change in the behaviour of the customers with the changes in the technological framework. Thus, this chapter has concluded the research by providing research framework based on the findings, discussing the contribution of the research to both theory as well as practice, identified research limitations and discussed scope for further research on the subject.

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9 Appendices

9.1 Appendix-1: Consent form used in the research

Consent form

Dear Respondent,

The responses you will give will be treated confidentially and will not be revealed to anyone under any circumstances.

This questionnaire/ interview aims to explore the issues regarding the user acceptance of mobile commerce in the travel industry. The title of this research is "Potential User Acceptance of M-commerce in Saudi Arabia:

The Case of E- ticketing ". The reason for conducting this research is to gather more information about the perception of the Saudi Arabian consumers and the personnel regarding m-commerce services, specifically, e-ticketing service and to provide useful recommendations in order to improve the level of consumer acceptance of this service. The confidentiality of the participants is maintained and their information will not be disclosed to any third party.

If you wish to continue with your participation with this research please sign this form, which will represent your explicit agreement to participate in this study. You have the right to withdraw your participation to this research for any reason at any point during the survey/interview. Thank you very much.

_____

Respondent's signature   Date

9.2 Appendix-2: List of questions for the interviews with airline employees

➢ *Questions for Information Technology (IT) department*

- o What are the key issues related to the information technology systems in adoption of mobile ticketing services by the airline customers?
- o Are the risks perceived by customers with regards to the use of m-commerce well founded?
- o Can the systems be trusted to protect the identity and payment information details of airline customers?
- o What key changes can be brought about to improve the acceptance of mobile commerce amongst airline customers?
- o What are the benefits to the airline if the customers use mobile technologies to make the booking?
- o What support is provided by the airline if the ticketing process gets halted during the purchase?
- o How user friendly are the mobile ticketing platforms?
- o What are the key benefits of m-commerce for ticketing?
- o What are the major costs associated with mobile ticketing process?
- o How useful is mobile ticketing for the airline customers?
- o What are some of the key initiatives of the airline to improve the adoption of mobile ticketing services?

➢ *Questions for Central Ticket Office (CTO)*

- o Why is it necessary for the airline to offer mobile ticketing services?
- o What has been your experience with the customers who have tried purchasing tickets through the m-commerce route?
- o Since the launch of mobile ticketing, what have been the key changes in the ticket purchase process?
- o How is the purchase of ticketing through the mobile channel different from the traditional mode?
- o What proportion of ticketing sales are happening through mobile commerce?
- o Has there been any trend in terms of the profile of customers who purchase through the traditional mode and those who buy electronically or through mobile?

- o What support is provided by the airline if the ticketing process gets halted during the purchase?

➢ *Questions for sales department*

- o What proportion of ticketing sales are happening through mobile commerce?
- o What are the major issues related to ticket sales through mobile commerce?
- o What is the general trend with regards to the mobile ticketing in the airline industry?
- o Is there a procedure for multi-channel transactions if the mobile transaction gets halted during the purchase?
- o What are some of the improvements planned by the airline over the next couple of years to improve the acceptance of mobile ticketing amongst airline customers?

➢ *Questions for the marketing department*

- o What are the key trends in the use of e-ticketing services generally across industries and specific to airline industry in Saudi Arabia?
- o Do you actively promote mobile ticketing service?
- o What has been the major feedback related to the benefits and limitations of mobile ticketing?
- o What are some of the key drivers and barriers of using mobile commerce for ticketing process?
- o What are the key contexts in which mobile ticketing will be the ideal choice?
- o Why is it necessary for the airline to offer mobile ticketing services?
- o What are the key steps that can be taken by the airlines to improve the sales of tickets through the electronic or mobile channel?
- o Has there been any trend in terms of the profile of customers who purchase through the traditional mode and those who buy electronically or through mobile?
- o What do you think is the role of social influence in influencing the adoption of mobile ticketing services?
- o Do you think the Saudi consumers carry a positive attitude towards mobile commerce?

9.3   Appendix-3: Questionnaire to be used for the consumer survey

The survey is being conducted to evaluate the purchase behaviour of airline consumers in Saudi Arabia with regards to purchasing their tickets through the use of their mobile phones. The survey will not take more than 15 minutes and we are grateful for your participation in the survey to share your views with us. The survey is divided into few sections that have been explained before the beginning of each section. Please answer these questions as per your understanding on what describes you and your experience best.

Part-I	The following statements are related to your experience with the mobile commerce in ticketing services. Please tick the rating that feel best describes your views					
		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	**Ease of using**					
1.1	Learning to use the mobile ticket is easy					
1.2	Purchasing a mobile ticket is easy					
1.3	Purchasing a mobile ticket is clear and understandable					
1.4	It is easy for me to perform the actions required to purchase a mobile ticket					
2	**Usefulness**					
2.1	It's faster to buy tickets with a mobile phone					
2.2	It's easier to buy tickets with a mobile phone					
2.3	It's more effective to buy tickets with a mobile phone					
2.4	Mobile phone is a useful device for purchasing tickets					
3	**Risk**					
3.1	Mobile phones are reliable enough devices for purchasing mobile tickets					
3.2	Mobile networks are reliable enough for purchasing mobile tickets					
3.3	In mobile ticket use the risk of problems due to low battery or lost network connection is small					
3.4	The risk of technical problems in mobile ticketing system is small					
3.5	The risk that I make errors when ordering a mobile ticket is small					
3.6	The risk of billing error is small					
3.7	The risk of not receiving the ticket or receiving it after a long delay is small					
4	**Use context - I use/expect to use mobile tickets if...**					
4.1	My travel card has no value or the period is expired					
4.2	I have no cash for purchasing the ticket					
4.3	I'm in a hurry or need the ticket fast					
4.4	I need the ticket unexpectedly and have not prepared for purchasing it					
4.5	If there are queues in points of ticket sale					
5	**Trust**					
5.1	Saudi Arabia public transport systems have trustworthy mobile ticket providers					

5.2	My mobile operator is a trustworthy mobile ticket intermediary					
5.3	Saudi Arabia public transport systems supply capable and competent mobile ticket providers					
5.4	My mobile operator is a capable and competent mobile ticket intermediary					
6	**Compatibility**					
6.1	Purchasing mobile tickets is compatible with my other use of the mobile phone					
6.2	Purchasing mobile tickets is a suitable method for me to purchase single tickets					
6.3	Using mobile tickets is compatible with my style and habits					
6.4	Mobile ticket is compatible with my way to use public transportation					
7	**Social Influence**					
7.1	Mobile ticket users are forerunners					
7.2	Using mobile tickets is trendy					
7.3	Using mobile tickets gives me more respect					
7.4	People whose opinion I value have recommended mobile ticket to me					
8	**Mobility**					
8.1	Purchasing a ticket with a mobile phone reduces queuing					
8.2	Purchasing mobile tickets is independent of time					
8.3	Purchasing mobile tickets is independent of place					
8.4	I can substitute the need for cash or travel card by purchasing a mobile ticket					
9	**Cost**					
9.1	A mobile ticket is inexpensive					
9.2	The price of the ticket when purchased with a mobile phone is reasonable					
9.3	Mobile ticket is the most affordable single ticket type to me					
10	**Attitude**					
10.1	Purchasing a ticket with a mobile phone is a good idea					
10.2	Purchasing a ticket with a mobile phone is wise					
10.3	I like the idea of purchasing a ticket with a mobile phone					
11	**Behavioural Intention**					
11.1	I intend to purchase tickets through mobile commerce the next time					
11.2	I predict that I will purchase tickets through mobile commerce in the near future					
11.3	I plan to purchase tickets through mobile commerce the next time					
Part-II	**Please provide us with your basic information**					
12	Gender	_____				
13	Qualification	_____				
14	Age	_____				
15	Nationality	_____				

9.4 Appendix – 4: Frequencies of response for the measurements

		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Missing
Easy To Learn	Frequency	6	11	18	131	41	
	Percent	2.9	5.3	8.7	63.3	19.8	
	Cumulative Percent	2.9	8.2	16.9	80.2	100.0	
Easy To Purchase	Frequency	13	18	28	91	56	1
	Percent	6.3	8.7	13.5	44.0	27.1	
	Cumulative Percent	6.3	15.0	28.6	72.8	100.0	
Clear And Understandable	Frequency	11	11	17	109	58	1
	Percent	5.3	5.3	8.2	52.7	28.0	
	Cumulative Percent	5.3	10.7	18.9	71.8	100.0	
Easy To Perform The Steps Needed	Frequency	9	15	21	119	43	
	Percent	4.3	7.2	10.1	57.5	20.8	
	Cumulative Percent	4.3	11.6	21.7	79.2	100.0	
Faster	Frequency	7	20	29	109	42	
	Percent	3.4	9.7	14.0	52.7	20.3	
	Cumulative Percent	3.4	13.0	27.1	79.7	100.0	
Useful	Frequency	12	11	22	118	44	
	Percent	5.8	5.3	10.6	57.0	21.3	
	Cumulative Percent	5.8	11.1	21.7	78.7	100.0	
Phone Reliable	Frequency	16	16	22	97	54	2
	Percent	7.7	7.7	10.6	46.9	26.1	
	Cumulative Percent	7.8	15.6	26.3	73.7	100.0	
Network Reliable	Frequency	20	39	34	47	67	
	Percent	9.7	18.8	16.4	22.7	32.4	
	Cumulative Percent	9.7	28.5	44.9	67.6	100.0	
Low Risk Of Battery And Loss Of Network	Frequency	38	29	29	55	56	
	Percent	18.4	14.0	14.0	26.6	27.1	
	Cumulative Percent	18.4	32.4	46.4	72.9	100.0	
	Frequency	36	30	43	39	57	2
	Percent	17.4	14.5	20.8	18.8	27.5	

Small Risk Technical Problem	Cumulative Percent	17.6	32.2	53.2	72.2	100.0	
Small Risk Of Errors	Frequency	40	23	34	57	49	4
	Percent	19.3	11.1	16.4	27.5	23.7	1.9
	Cumulative Percent	19.7	31.0	47.8	75.9	100.0	
Small Risk Of Billing	Frequency	33	24	42	54	51	3
	Percent	15.9	11.6	20.3	26.1	24.6	
	Cumulative Percent	16.2	27.9	48.5	75.0	100.0	
Small Risk Of Not Receiving Or Delay	Frequency	24	20	47	59	54	3
	Percent	11.6	9.7	22.7	28.5	26.1	
	Cumulative Percent	11.8	21.6	44.6	73.5	100.0	
Travelcard Not Available	Frequency	14	25	71	50	43	4
	Percent	6.8	12.1	34.3	24.2	20.8	
	Cumulative Percent	6.9	19.2	54.2	78.8	100.0	
Nocash	Frequency	12	36	47	65	44	3
	Percent	5.8	17.4	22.7	31.4	21.3	
	Cumulative Percent	5.9	23.5	46.6	78.4	100.0	
In A Hurry	Frequency	10	11	18	123	42	3
	Percent	4.8	5.3	8.7	59.4	20.3	
	Cumulative Percent	4.9	10.3	19.1	79.4	100.0	
Unexpected Purchase	Frequency	13	15	43	94	39	3
	Percent	6.3	7.2	20.8	45.4	18.8	
	Cumulative Percent	6.4	13.7	34.8	80.9	100.0	
Long Queue	Frequency	10	13	34	102	43	5
	Percent	4.8	6.3	16.4	49.3	20.8	
	Cumulative Percent	5.0	11.4	28.2	78.7	100.0	
Trustworthy Ticket Providers	Frequency	25	61	53	32	32	4
	Percent	12.1	29.5	25.6	15.5	15.5	
	Cumulative Percent	12.3	42.4	68.5	84.2	100.0	
Mobile Operator Is Trustworthy	Frequency	14	26	51	53	59	4
	Percent	6.8	12.6	24.6	25.6	28.5	
	Cumulative Percent	6.9	19.7	44.8	70.9	100.0	
Capable And Competent	Frequency	28	60	58	29	28	4
	Percent	13.5	29.0	28.0	14.0	13.5	

Ticket Providers	Cumulative Percent	13.8	43.3	71.9	86.2	100.0	
Capable And Competent Mobile Operator	Frequency	23	27	51	50	52	4
	Percent	11.1	13.0	24.6	24.2	25.1	
	Cumulative Percent	11.3	24.6	49.8	74.4	100.0	
Compatible With Other Uses Of Phone	Frequency	22	17	35	71	57	5
	Percent	10.6	8.2	16.9	34.3	27.5	
	Cumulative Percent	10.9	19.3	36.6	71.8	100.0	
Suitable For Single Ticket Purchase	Frequency	11	19	26	102	45	4
	Percent	5.3	9.2	12.6	49.3	21.7	
	Cumulative Percent	5.4	14.8	27.6	77.8	100.0	
Compatible With Style And Habits	Frequency	12	14	23	109	44	5
	Percent	5.8	6.8	11.1	52.7	21.3	
	Cumulative Percent	5.9	12.9	24.3	78.2	100.0	
Compatible With Use Of Public Transport	Frequency	13	14	35	91	49	5
	Percent	6.3	6.8	16.9	44.0	23.7	
	Cumulative Percent	6.4	13.4	30.7	75.7	100.0	
Users Are Front Runners	Frequency	11	13	63	68	47	5
	Percent	5.3	6.3	30.4	32.9	22.7	
	Cumulative Percent	5.4	11.9	43.1	76.7	100.0	
Mobile Ticket Is Trendy	Frequency	16	16	39	83	49	4
	Percent	7.7	7.7	18.8	40.1	23.7	
	Cumulative Percent	7.9	15.8	35.0	75.9	100.0	
Gets More Respect	Frequency	11	48	58	51	35	4
	Percent	5.3	23.2	28.0	24.6	16.9	
	Cumulative Percent	5.4	29.1	57.6	82.8	100.0	
Resolves Queueing	Frequency	8	14	25	123	31	6
	Percent	3.9	6.8	12.1	59.4	15.0	
	Cumulative Percent	4.0	10.9	23.4	84.6	100.0	
Independent Of Time	Frequency	11	12	25	99	55	5
	Percent	5.3	5.8	12.1	47.8	26.6	
	Cumulative Percent	5.4	11.4	23.8	72.8	100.0	
Independent Of Place	Frequency	7	15	35	105	40	5
	Percent	3.4	7.2	16.9	50.7	19.3	

	Cumulative Percent	3.5	10.9	28.2	80.2	100.0	
No Need To Carry Cash Or Card	Frequency	11	13	37	96	45	5
	Percent	5.3	6.3	17.9	46.4	21.7	
	Cumulative Percent	5.4	11.9	30.2	77.7	100.0	
Inexpensive	Frequency	27	37	82	34	22	5
	Percent	13.0	17.9	39.6	16.4	10.6	
	Cumulative Percent	13.4	31.7	72.3	89.1	100.0	
Reasonable Price	Frequency	17	26	79	48	32	5
	Percent	8.2	12.6	38.2	23.2	15.5	
	Cumulative Percent	8.4	21.3	60.4	84.2	100.0	
Most Affordable Single Ticket	Frequency	24	22	68	43	46	4
	Percent	11.6	10.6	32.9	20.8	22.2	
	Cumulative Percent	11.8	22.7	56.2	77.3	100.0	
Good Idea	Frequency	8	10	18	126	41	4
	Percent	3.9	4.8	8.7	60.9	19.8	
	Cumulative Percent	3.9	8.9	17.7	79.8	100.0	
Wise	Frequency	10	18	43	89	41	6
	Percent	4.8	8.7	20.8	43.0	19.8	
	Cumulative Percent	5.0	13.9	35.3	79.6	100.0	
Like The Idea	Frequency	9	12	18	165	204	
	Percent	4.3	5.8	8.7	79.7	98.6	
	Cumulative Percent	4.4	10.3	19.1	100.0		
Intend to use	Frequency	10	15	80	63	36	
	Percent	4.8	7.2	38.6	30.4	17.4	
	Cumulative Percent	6.3	13.5	52.2	82.6	100.0	
Predict to use	Frequency	5	16	90	66	27	
	Percent	2.4	7.7	43.5	31.9	13.0	
	Cumulative Percent	3.9	11.6	55.1	87.0	100.0	
Plan to use	Frequency	12	4	7	120	61	
	Percent	5.8	1.9	3.4	58.0	29.5	
	Cumulative Percent	7.2	9.2	12.6	70.5	100.0	

9.5 Appendix – 5: Descriptive statistics for scale items

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Easy to learn	207	3.92	.869	-1.408	.169	2.674	.337
Easy to purchase	206	3.77	1.131	-.970	.169	.277	.337
Clear and understandable	206	3.93	1.029	-1.355	.169	1.681	.337
easy to perform the steps needed	207	3.83	.983	-1.233	.169	1.435	.337
faster	207	3.77	.992	-.964	.169	.633	.337
useful	207	3.83	1.014	-1.310	.169	1.600	.337
phone reliable	205	3.77	1.156	-1.069	.170	.415	.338
network reliable	207	3.49	1.365	-.401	.169	-1.148	.337
low risk of battery and loss of network	207	3.30	1.464	-.363	.169	-1.273	.337
small risk technical problem	205	3.25	1.449	-.237	.170	-1.278	.338
small risk of errors	203	3.26	1.447	-.367	.171	-1.223	.340
small risk of billing	204	3.32	1.391	-.396	.170	-1.078	.339
small risk of not receiving or delay	204	3.49	1.300	-.552	.170	-.727	.339
travelcard not available	203	3.41	1.154	-.283	.171	-.592	.340
nocash	204	3.46	1.180	-.366	.170	-.803	.339
in a hurry	204	3.86	.968	-1.400	.170	2.069	.339
unexpected purchase	204	3.64	1.071	-.873	.170	.364	.339
long queue	202	3.77	1.017	-1.036	.171	.900	.341
trustworthy ticket providers	203	2.93	1.258	.246	.171	-.964	.340
mobile operator is trustworthy	203	3.58	1.226	-.480	.171	-.726	.340
capable and competent ticket providers	203	2.85	1.235	.294	.171	-.834	.340
capable and competent mobile operator	203	3.40	1.306	-.382	.171	-.917	.340
compatible with other uses of phone	202	3.61	1.277	-.763	.171	-.427	.341
suitable for single ticket purchase	203	3.74	1.073	-1.002	.171	.490	.340
compatible with style and habits	202	3.79	1.051	-1.176	.171	1.041	.341

compatible with use of public transport	202	3.74	1.100	-.960	.171	.435	.341
users are front runners	202	3.63	1.077	-.591	.171	-.020	.341
mobile ticket is trendy	203	3.66	1.160	-.834	.171	.007	.340
gets more respect	203	3.25	1.157	-.038	.171	-.925	.340
resolvesqueueing	201	3.77	.931	-1.253	.172	1.676	.341
independent of time	202	3.87	1.054	-1.171	.171	1.076	.341
independent of place	202	3.77	.966	-.967	.171	.871	.341
no need to carry cash or card	202	3.75	1.046	-.978	.171	.676	.341
inexpensive	202	2.94	1.151	.028	.171	-.559	.341
reasonable price	202	3.26	1.130	-.208	.171	-.478	.341
most affordable single ticket	203	3.32	1.267	-.298	.171	-.791	.340
good idea	203	3.90	.914	-1.442	.171	2.540	.340
wise	201	3.66	1.056	-.780	.172	.188	.341
like the idea	204	3.66	.780	-2.340	.170	4.460	.339
Intend	207	3.44	1.099	-.631	.169	.586	.337
Predict	207	3.41	.990	-.597	.169	1.219	.337
Plan	207	3.99	1.079	-1.899	.169	3.780	.337

9.6 Appendix – 6: Regression analysis – BI with nine independent variables – excluded variables

Excluded Variables

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics Tolerance
1	PE OU	.147	2.265	.025	.157	.743
	U	.141	2.278	.024	.158	.812
	PR	.094	1.541	.125	.107	.847
	UC	.192	2.872	.005	.197	.688
	T	.135	2.014	.045	.140	.699
	SI	.227	3.276	.001	.224	.634
	M	.323	4.413	.000	.295	.546
	CO	.213	3.220	.001	.220	.697
2	PE OU	.079	1.225	.222	.086	.692
	U	.116	1.947	.053	.135	.805
	PR	.074	1.250	.213	.087	.841
	UC	.111	1.629	.105	.114	.618
	T	.099	1.529	.128	.107	.687
	SI	.132	1.815	.071	.126	.543
	CO	.166	2.556	.011	.177	.674
3	PE OU	.078	1.225	.222	.086	.692
	U	.104	1.746	.082	.122	.798
	PR	.035	.570	.569	.040	.775
	UC	.100	1.477	.141	.103	.615
	T	.075	1.155	.249	.081	.670
	SI	.093	1.249	.213	.088	.511

9.7   Appendix – 7: Meaning of the correlation coefficient for two variables

If r =
+.70 or higher   Very strong positive relationship
+.40 to +.69   Strong positive relationship
+.30 to +.39   Moderate positive relationship
+.20 to +.29   weak positive relationship
+.01 to +.19   No or negligible relationship
-.01 to -.19   No or negligible relationship
-.20 to -.29   weak negative relationship
-.30 to -.39   Moderate negative relationship
-.40 to -.69   Strong negative relationship
-.70 or higher   Very strong negative relationship

9.8 Appendix – 8: Table of changes as prescribed by the supervisor

Provided by:
Dr Mark Springett (External Examiner)
Dr Martin De Saulles (Internal Examiner)

Chapter	**Changes proposed/made**	**Changes done**	**Page # to track changes (highlighted in yellow)**
Chapter 2, Para 1	Clarified who permission to travel is obtained from	For females travelling alone need permission from a male family member	17
Chapter 3 section 3.3.4	Clarified if the respondents had basic or computer literacy	Clarified the impact of what sort of literacy they have for their interaction with technology	34
Chapter 5 Section 5.9.2.2	Reference that the survey conducted by the organisation.	Added clarity on key findings of survey and answers	99 - 102
Chapter 5	Conclusion was added	Tied up the key findings of each section and made meaningful conclusion	105
Chapter 7 Section 7.2.1	Theory and framework integration	Connected findings of research to an improved and robust framework	130
Chapter 7 Section 7.2.2	Practicality of thesis in corporate sector	Practical examples of what ideas can be	135

		implemented by corporate world.	