# SMS BANKING IN SAUDI ARABIA

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# SMS BANKING IN SAUDI ARABIA

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By

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# ABSTRACT

Banking has always been a highly information intensive activity particularly over the last few decades that information and Communication technology (ICT) has affected the banking industry heavily. The appearance of SMS banking services has changed the nature of financial services delivery costumers. One of the most growing phenomenons in financial services is mobile internet banking. The purpose of this study is explorer the adoption of SMS banking among Saudi customers, an emerging Middle East economy in the area. The present study modifies the technology acceptance model and applies it to banks customers in Saudi Arabia.

By providing SMS banking services, banks can get notable cost saving, reduce their branch networks, and improve efficiency. But since customers do not adopt and use these service, banks cannot profit from them. A numbers of Saudi banks recently have started to offer SMS banking services to their customers, but the fact it got a respectable reaction from people' point of view. A model of TAM with factors from perceived innovation attributes and the personal characteristics of adopters have been developed to identify the most factors that influence SMS banking adoption among Saudi customers. The result of this study were contribute were positively related to SMS banking adoption as hypothesized. The positive association between combination among all independent variables (ease of use, usefulness, credibility, compatibility and observability) was supported.

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We start with the name of Allah, we praise Allah and thank him for the blessings of completing this study, we humbly ask Allah to raise the rank of our prophet salla allahu alayhi wa sallam, and his kind al and companions and followers, we ask Allah to grant us the proper intention, the comprehension, and the reward in the hereafter.

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Alsaab Saif Abdullah.

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## LIST OF ABBREVIATIONS

**(IB):** Internet Banking

**(IT):** Information Technology

**(IS):** Information System

**(ATM):** Automatic Trailer Machine

**(TPB):** Theory of Planned Behavior

**(ICT):** Information and Communication Technology

**(TAM):** Technology Acceptance Model

**(TRA):** Theory of Reasoned Action

**(PBC):** Perceived Behavioral Control

**(BI):** Behavioral Intention

**(EOU):** Ease of Use

**(USE):** Usefulness

**(CRE):** Credibility

**(COM):** Compatibility

**(OB):** Observability

**(SMS)**: Short Message Services

# CHAPTER 1

# INTRODUCTION

## 1.1 INTRODUCTION

In the banking world, developments in information technology have had an enormous effect in development of more flexible payment methods and more user-friendly banking services (Akinci et al., 2004). Within the realm of IT, the internet is fast becoming one of the most efficient means to access, share information, conduct trade and arrange for delivery of goods and services. The convergence of the internet and wireless technology in the late 1990s has produced a revolutionary telecommunication service: mobile internet. Global mobile operators are now accelerating technological transition from 2G to 3G, while by June 2004 active users of wireless data applications exceeded 115 million worldwide and this figure is expected to be about 1.72 billion by 2007, with aggregate subscriber revenue of $584 billion (Okazaki, 2005). Such spectacular growth will change how we live. Online banking and other electronic payment systems are new, and the development and diffusion of these technologies by financial institutions is expected to result in a more efficient banking system. This technology offers institutions alternative or non-traditional delivery channels through which banking products and services can be delivered to consumers more conveniently and economically without diminishing the existing service levels. Short message services (SMS) banking is such a delivery channel

that deserves special attention from financial institutions, policy-makers, researchers, and academicians owing to its enormous potential from the viewpoint of banks, businesses, and retail consumers.

## 1.2 STUDY BACKGROUND

Short message services (SMS) has become a new technological buzzword in transmitting business-to-customer messages to such wireless devices as cellular telephones, pagers, and personal data assistants (PDAs). Many brands and media companies include text message numbers in their advertisements to enable interested consumers to obtain more information. As noted by Frolick and Chen, (2004) cited by Okazaki, this mode of advertising takes advantage of valuable channels of wireless communication to enhance customer relationships, and to carry out direct marketing and promotional activities. The adoption of SMS in marketing campaigns is sufficient to demonstrate that e-mail is the wireless application most used by consumers. The messaging frame is now being extended to include multimedia message services (MMS), which combine pictures, video, and sound. It is therefore instructive to note that many authors have pointed out the strategic importance of Mobile banking (also known as M-Banking, m-banking, SMS Banking etc.). SMS stands for Short Message Service; it is a mobile technology that allows for sending and receiving text or even binary messages to and from a mobile phone. SMS Banking is a Mobile technology that allows customers to request and receive banking information from a bank on his/her mobile phone via short message service (SMS) (Rotimi, 2007).

Individuals or corporate bodies can manage their bank accounts, check their account balances, perform check requests, money transfers, pay some bills, and perform other banking transactions using their mobile phones. There are two methods of SMS widely used in applications are the push and pull.

Overall, most Arab countries still have a long way to cover before being able to fully realize the benefits of the Internet and IT. It is no exaggeration to assert that very little is known about the state of the Internet and information technology in the Arab world and more so in some parts of it. This fact suggests bad news for those banks which are eager to exploit the Internet or IT to enter into the Arabian market, which is equal in size to that of the USA and in purchasing power to that of China and many other middle income countries (Aladwani 2003:9). Primary issues foreseen by Arab business managers include technical obstacles and the attitudes and behaviors of e-commerce consumers. Internet shoppers mentioned security, legal regulations, consumers' privacy, and business's reputation as the most important e-commerce issues in the Arab region. Given the current state of the Internet and IT in general in the region, Arab decision makers must be persuaded of the macro benefits of the Internet for Arab countries. Thus, a major issue that needs to be addressed in this study is to convince Saudi Arabian decision-makers that it is important to take the necessary practical steps for their countries to realize the benefits of the Internet/IT services such as SMS banking. On this specific point, one can confidently say that the Internet/IT can offer several benefits for the Saudi Arabian economy and society.

Until the discovery of its vast oil resources in 1938, the economy of Saudi Arabia was based on subsistence arid-zone agriculture and desert pastoralism (Assad, 2007). Presently, the economy is dominated by the oil industry. Large-scale oil production increased the national income exponentially, enabling expanded access to imported goods with the rise of individual incomes and the ability to consume. Since, 1970, development plans in Saudi Arabia have encouraged this trend, aiming to raise the standard of living of the Saudi individual by raising his/her income. Several studies agree that the spread of a consumer lifestyle and consumerist attitudes in Saudi Arabia is increasingly evident. According to Al-khateeb (1998, p. 172) cited in (Assad, 2007), Saudi society has become one of the most consumer-oriented societies in the world. All family members – men, women, and children – are encouraged to become consumers. Because Saudi Arabia plays an important role in the global community and the majority of its population is involved in consumption and leisure related-activities, studying their consumption patterns and behavior (towards SMS banking) becomes important for policy-makers, multinational corporations, and researchers**.**

## 1.3 PROBLEM STATEMENT

The most successful mobile banking and payment applications have been simple and easy-to-use SMS services. However, recent research shows that, despite the rapid diffusion of new mobile devices, mobile banking services such as SMS banking have not been widely adopted by bank customers. Mobile internet banking services are not widely used due to

high costs and perceived difficulty of use. Consumers have also reported that there is no real need for mobile internet-based banking services. In addition, conceptual discussion of which banking transactions fall under the term ``mobile banking'' is scarce. Laukkanen,(2007). While numerous studies have addressed conceptual issues and conducted general consumer surveys, there is little research available in the literature on customer perceptions of and utilization of mobile banking in Saudi Arabia. The introduction of the internet and new education systems make it easier for organizations to adapt to change in the near future. People's level of experience with technology is higher than a decade ago. The future of SMS banking looks encouraging and bright, if barriers are overcome.

Research into banking operations in the Middle East markets provides new insights for both academics and practitioners, because the Middle East is often referred as a promising but yet unexplored frontier for m-commerce Laukkanen, (2007). However, this argument has seldom been examined in an empirical context. To our knowledge, research on this theme is almost non-existent.Furthermore, literature on Saudi Arabia's level of technology innovation in banking is scarce and generalized, providing broad historical information about attitude of people to pay for the services. Al Sadhan, (2009) states that people are not willing to pay for the services while the account of Al-khateeb (1998, p. 172) cited in (Assad, 2007) states that the consumers lifestyle in Saudi make them to pay for many services. There are various Saudi banks but academic study does not provide enough substantial information. Internet sources are also unhelpful in providing relevant technology innovation information about Saudi Arabia. Nevertheless, these researches thus

need secondary data to make analysis. In this respect SMS banking adoption in Saudi Arabia at this stage is under-researched, although the country is ahead of many developing countries in the region.

The Middle East is often referred as a promising but yet unexplored frontier for m-commerce. However, this argument has seldom been examined in an empirical context. To our knowledge, research on this theme is almost non-existent.

## 1.4 RESEARCH QUESTIONS

This study intends to answer some questions which shall make it to be of importance to the problem domain, the questions are:

1. Is the usage of e-banking influenced by the accessibility of computers?
2. Is its usage affected by e-banking awareness?
3. Does the cost of computers and Internet access affect usage of e-banking?
4. In terms of security is the use of Internet bank transactions a concern for the use of e-banking?
5. Are customers willing to change a factor that affects usage of e-banking?

## 1.5 OBJECTIVES OF STUDY

The purpose of this study is in two-fold. First, it seeks to shed more light on SMS banking statistics in Saudi Arabia. Second, it tries to suggest some guidelines to Saudi Arabia policy makers on how to build an environment conducive for SMS banking operations.

Such that shall engender competitiveness of its banking system in the global economy. The specific objectives of the study are:

1. To understand the nature of mobile phone use among respondents and investigate their perceptions on the mobile phone banking applications.
2. To explore the utilization of mobile phone services in the banking environment in Saudi Arabia.
3. To explore the nature of mobile phone use among Saudi Arabian university students.
4. To investigate the perception of Saudi Arabian university students on mobile phone usage and application in banking services.

## 1.6 SIGNIFICANCE OF STUDY

The study of SMS banking is important for two reasons. First, understanding a new information technology and its acceptance can help to reveal the underlying logic of practitioners' strategic decisions in information management. This study adds to the available literature on customer perceptions and utilization of mobile banking in Saudi Arabia, because there is little empirical evidence of customer adoption of mobile banking in the Middle East markets.

Secondly, this study also fills the research gap on the analysis of the perceptions of banks and customers operating in the Middle East regarding SMS-based mobile banking

adoption. Researchers willing to highlight the factors that motivate users' ICT adoption while describing how the Arab culture affects ICT usage will also find this study resourceful. This study also provides information for managers and software vendors seeking to enhance the adoption of communication-oriented forms of ICT and telecommunications in the Arab world.

## 1.7 SCOPE OF STUDY

This study shall endeavor to determine those factors that influence the formation of attitude towards SMS banking and their relation to the use of SMS banking services. While this research focuses on attitude development in particular, it also investigates individual differences in demographics and perceptions. Hence, the users of public and private banks in Saudi Arabia are the respondents in this study. Their perception about each of the variables of the technology accepted model shall be examined using the exiting model. We made use of SMS usage situation based on primary and secondary data. The main limitation of the study is that it relies heavily on secondary data.

## 1.8 OUTLINE OF THE THESIS

This research report will consist of five chapters. This chapter has given a detail account of the need for this study, the objectives, scope and significance of the study. The second

chapter presents the past works (literature review) in this subject area. Chapter three presents the methodology that was adopted in this study. Chapter four discusses the findings and results from the study while chapter five concludes the documentation of the study, with the contribution of the study and recommendation for future work. Figure 1.1 below gives a diagrammatic expression of the study.

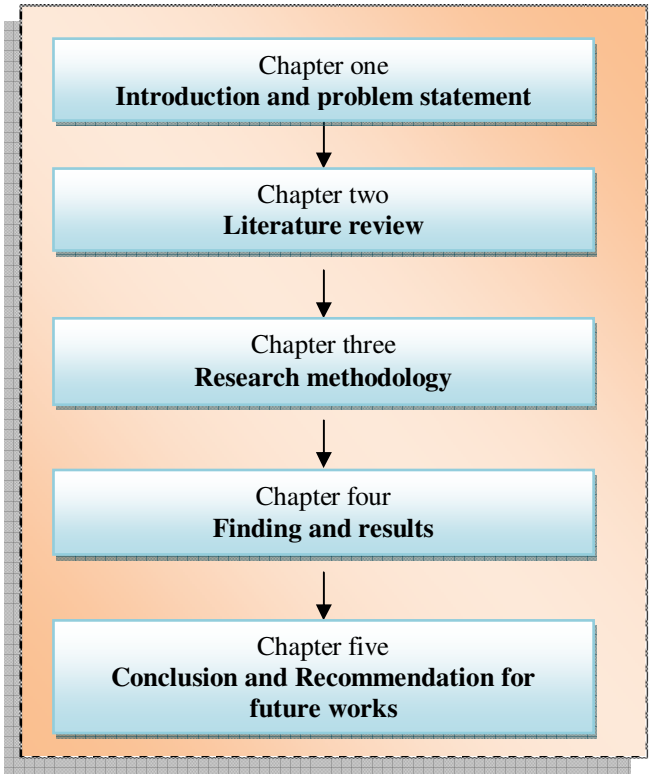


Figure 1.1: Outline of Thesis

# CHAPTER 2

# LITERATURE REVIEW

## 2.1 INTRODUCTION

The numerous approaches to the study and uses of mobile and electronic banking are discussed in this chapter. The approaches the study of the usage of mobile devices for banking purpose were discussed. The underlying technology, security issues with mobile banking and the attitudes of people to the technology were also discussed in details along side with the technology acceptance model.

## 2.2 E-BANKING USAGE AND STANDARDS

The last decade has witnessed a rapid accumulation of studies on electronic banking, technology-oriented bank services, and distribution channels. As the new technology spreads across various sectors, businesses as well as academicians are tempted to assess the opportunities created by the new technology in a comparative manner with the existing operations. The vast opportunities brought by the Internet to the banking industry have therefore attracted much attention from researchers whose efforts apparently group on certain areas of interest (Akinci et al., 2004). Internet together with other information and communication technologies are not only driving financial global economies but also transforming societies into knowledge-based economies around the world. Recognizing

the vast potential of these technologies to better the lives of people, American, European and far east governments are investing substantially on different initiatives to harness the full power of the internet (Ahmed, 2006). Arab states such as Saudi Arabia should not be an exception to this transformational phenomenon.

In the era of improved mobile communication technologies, vast amount of changes are generated in facilitating communication and the transfer of information namely from business to business, business to customers, employers to employees, etc. and in providing more and more added value services (Karim et. Al, 2006). The technologies have made communication and access to information very convenient and timely to the users from the comfort of their own home and office, and from where ever they are while on the move with their mobile phone units or PDAs. The use of mobile technologies is increasingly widespread especially among the Arab countries such as Saudi Arabia. Various applications can be observed among the users, which ranged from telephone conversation and simple text messages (SMS), to multimedia messaging services (MMS) and internet access, depending on the capability of each mobile phone technology and services rendered. These applications have been made possible through various developments in the mobile telephone technology such as GPRS, WAP, and the 3G standard.

## 2.3 SUPPORTING TECHNOLOGIES AND INFRASTRUCTURES

### *2.3.1 Using Telecommunication Infrastructure*

Despite the various information services provided through mobile phone services, assessments need to be made in order to understand the needs and requirements of the mobile phone users (Karim et al. 2006). Many information related services provided through a mobile phone as a delivery mode are left under utilized due to lack of understanding on the users and the nature of the contents and services needed. Although library related services via a mobile phone is not yet implemented in the higher learning institution in Malaysia, such services is inevitable in the future. When the time comes, the academic institutions and the telecommunication companies need to be well prepared with the knowledge and understanding of the concepts within the provision of library and information services and what the users need.

According to Mutula (2002) cited in Karim et al(2006), telecommunication technology is developing in such a rapid speed and wireless communication standards and capabilities are evolving rapidly across the spectrum. The first generation standard (1G) for voice only was developed in 1979. This is followed by the second generation (2G) standard using global system for mobile communications (GSM)/TDMA – time division multiple access, which emerged somewhere in 1992. TDMA is a technology for delivering a digital wireless service using the time-division multiplexing (TDM) technique. The way TDMA works is by dividing a radio frequency into time slots and then allocating slots to multiple

calls. The technology is used by the GSM digital cellular system by allowing multiple simultaneous data channels to be transmitted in a single frequency. By using narrowband TDMA, GSM allows eight simultaneous calls on the same radio frequency (www.webopedia.com). The generation that follows is based on 2.5G standard known as General Packet Radio Service (GPRS), with speeds capability of 115Kbps. Another standard also emerged in 2002 called Enhanced Data GSM Environment (EDGE) as a faster version of GSM with the speed of up to 384Kbps on a broadband channel.

The most recent standard that follows is called 3rd Generation or 3G, which networks are fully operated in many countries in the world. In Europe, a recent survey by Taylor Nielson Sofres indicated that 42 percent of mobile phones users in Europe were interested in 3G services (Karim et al. 2006). The 3G technology is developed based on the convergence of different devices, networks and content. The 3G telephone enables users to access data, voice, and video, as well as internet access through wireless application protocol (WAP). The 3G uses the wideband code division multiple access (WCDMA) technique, which is basically a high speed 3G mobile wireless technology with the capacity to offer higher data speeds. WCDMA can reach speeds of up to 2Mbps for voice, video, data and image transmission. Once the 3G technology is introduced, the users can enjoy internet access with a much faster speed using their 3G mobile phone units. Among the services currently available includes traffic monitoring system, instant video clips, live media, “face-to-face” conversation, etc., where all of which are made possible through higher bandwidths (Karim et al. 2006).

### *2.3.2 The Wireless Technology*

Another development in wireless technology involves mobile phone access to the internet via wireless application protocol (WAP). WAP is a specification for a set of communication protocols to standardize the way that wireless devices, such as cellular telephones and radio transceivers, can be used for internet access, including e-mail, the World Wide Web, newsgroups, and internet relay chat (IRC). While internet access has been possible in the past, different manufacturers have used different technologies. In the future, devices and service systems that use WAP will be able to interoperate. The technology has managed to generate a vast amount of investment in wireless phone services such as news, weather, financial services, banking information, travel agencies, timetables, leisure, and so on. Currently, many of the information services using the mobile phone technologies are made based on GSM and GPRS standards and technologies. The limitation in terms of speed and small screen size may be reflected in the types of services used (Karim et al. 2006). The SMS have been the most common mean of services used to transfer information among the wireless phone users.

## 2.4 INTERNET AND MOBILE TECHLOOGIES IN SAUDI ARABIA

The widespread use of mobile phone technologies as compared to the use of personal computers can be clearly seen across all walks of life in the Saudi society. While internet uses tend to be dominated by middle to high class society, the penetration of the mobile phone uses seems to move across the lower and the minority class boundaries. These include the lower class groups, young adults, and senior users. The use can also be seen widespread among students at the institution of higher learning. Such widespread use may provide broad opportunities for institutions and businesses alike in applying the technology for commercial as well as for educational purposes. The advent of new channels has contributed not only to the adoption of multi-channel strategies by the existing banking institutions but also the emergence of new forms of financial businesses such as "virtual banks" (Akinci et al., 2004). This trend is evident in the related literature that several studies have comparatively investigated the current usage levels and advantages of financial distribution channels. Based on a survey among UK consumers for example, Howcroft et al. (2002) cited in (Akinci et al., 2004) have found that consumers had a preference for a mix of delivery channels rather than exclusive reliance upon any one single channel. In another exploratory study in the UK, Black et al. (2002) also cited in Akinci et al., argued that consumers' channel choice in financial services was determined by consumer, product, channel, and organizational characteristics in which product-channel interactions and consumer-channel interactions were of particular importance. Thornton and White (2001) have compared seven distribution channels (ATM, EFTPOS,

credit card, cheque, human teller, telephone, and Internet) with a view to a set of variables affecting their usage. They concluded that customer orientations such as convenience, service, technology, change, knowledge, computer, and Internet affected the usage of different channels. The usage of ATM, EFTPOS, and telephone increased as customers were more oriented towards change, knowledge, computer, and confidence.

## 2.5 M-BANKING SECURITY ISSUES

The convenience of executing simple transactions and sending out information or alerting a customer on the mobile phone is often the overriding factor that dominates over the skeptics who tend to be overly bitten by security concerns. As a personalized end-user communication instrument, today mobile phones are perhaps the easiest channel on which customers can be reached on the spot, as they carry the mobile phone all the time no matter where they are. Besides, the operation of SMS banking functionality over phone key instructions makes its use very simple. This is quite different from internet banking which can offer broader functionality, but has the limitation of use only when the customer has access to a computer and the Internet. Also, urgent warning messages, such as SMS alerts, are received by the customer instantaneously; unlike other channels such as the post, email, Internet, telephone banking, etc. on which a bank's notifications to the customer involves the risk of delayed delivery and response. The SMS banking channel also acts as the bank’s means of alerting its customers, especially in an emergency situation; e.g. when there is an ATM fraud happening in the region, the bank can push a mass alert (although not subscribed by all customers) or automatically alert on an individual basis when a

predefined ‘abnormal’ transaction happens on a customer’s account using the ATM or credit card. This capability mitigates the risk of fraud going unnoticed for a long time and increases customer confidence in the bank’s information systems.

The lack of encryption on SMS messages is an area of concern that is often discussed. This concern sometimes arises within the group of the bank’s technology personnel, due their familiarity and past experience with encryption on the ATM and other payment channels. The lack of encryption is inherent to the SMS banking channel and several banks that use it have overcome their fears by introducing compensating controls and limiting the scope of the SMS banking application to where it offers an advantage over other channels. Suppliers of SMS banking software solutions have found reliable means by which the security concerns can be addressed. Typically the methods employed are by pre-registration and using security tokens where the transaction risk is perceived to be high. Sometimes ATM type PINs are also employed, but the usage of PINs in SMS banking makes the customer's task more cumbersome. Key challenges in developing a sophisticated mobile banking application are : handset operability, security, scalability and reliability

### *2.5.1 Inadequate Trust In The Technology*

The lack of trust in online transactions is one of the main reasons for the relatively low electronic commerce adoption, especially in developing and emerging economies such as those of the countries of the Gulf Cooperation Council (GCC) (Shalhoub, 2006). The GCC was established in accordance with an agreement concluded in 1981 in Riyadh, Saudi

Arabia between: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE. It is always difficult to analyze trust as a phenomenon and may be almost impossible to analyze trust in the context of electronic commerce because of the complexity of electronic commerce. However, one can conclude that from a functional perspective trust can be seen as a different but potentially coexisting mechanism for reducing the uncertainty, anxiety and complexity of transactions and relationships in electronic markets. Trust will be the decisive factor for success or failure of e-businesses. It is, therefore, vitally important for companies doing business online to act in a way that engenders consumers' trust. Efforts to increase the security of e-commerce systems and trustworthy behaviour of e-tailers will prove to be of advantage for both consumers and companies engaging in e-commerce.

### *2.5.2 The Caution within The Banks In Saudi Arabia*

Banks in Saudi Arabia are moving slowly and with caution into the e-banking because their concerns for security and reliability. There are a multiple calls for academicians, computer specialists, and people at large to pay serious attention to banking system and increase awareness of its implication on the country future. Once customers are convinced about the multifarious advantages of e-banking they will move ahead to the virtual bank system. According to Ahmed et al.(2006), the key challenges identified for Saudi's organisations are the continuing reliance on face-to-face contact principles, problems with information overload, charges still expensive, the need for technical support and expertise, lack of a management commitment and understanding the potential role of information technology (IT) on the country's future and that middle aged and older people were more

reluctant to use IT. The current study seeks to identify factors that influence SMS adoption in an Arab country, since there is a shortage of IT adoption studies set in the Arab world. It is worth mentioning that less than 1 per cent of the 236 articles published in the ten-year period between 1990 and 1999 in a prestigious international journal focused on users in Arab countries in the Middle East (Rouibah, 2008). Saudi Arabia is the focus of this study because it is one of few Arab countries that has achieved relatively high levels of IT usage. For example, its PC penetration in 2007 was ranked second after the United Emirates Arab.

The emergence of the internet has had a significant impact on the diffusion of e-banking. With the help of the internet, banking is no longer bound to time and geography. Consumers all over the world have relatively easy access to their accounts 24 hours per day, seven days a week (Karjaluoto et al. (2002). Therefore, internet banking provides many benefits to both banks and their customers. However, the acceptance of this technology has not been equal in all parts of the world (Karjaluoto et al. (2002).The study will explore the effect of different factors affecting attitude formation towards SMS banking in Saudi Arabia. Researchers and practioners have mainly focused on the growth of the internet and the opportunities it provides. However, much more attention should be given to research that helps to understand the factors that motivate consumers to go online and use the internet for commercial and service purposes such as SMS banking. In essence, the purpose of this study is to determine those factors that influence the formation of attitude towards mobile banking on the one hand, and their relation to the use of SMS

banking services, on the other. The results of this study are expected to provide both theoretical and practical contributions in the area of mobile banking and understanding of consumer behaviour.

## 2.6 ATTITUDE TO THE USAGE OF INTERNET AND MOBILE BANKING

According to Karjauloto et al. (2002), attitudes are said to develop over time through a learning process affected by reference group influences, past experience and personality. Individual differences in consumer behaviour have been theorized and found to be associated with the acceptance of new IT such as mobile banking. Assael (1981) cited in Karjauloto et al. (2002), for example, argues that consumer behaviour should be studied through demographics, beliefs and attitudes. In this study, one central point under investigation will be demographic features because they are said to be easier to study due to their objective and standardized nature. The technology acceptance literature suggests a strong relationship between age and the acceptance of new technologies. Older consumers are found to have problems with new technologies and hence, are expected to have negative attitudes towards innovations. Trocchia and Janda (2000) quoted by Karjauloto et al. (2002), find that many older consumers have a more negative attitude to change. However they argue that a person's overall attitude or perception of technology has a greater effect than age. Similar studies have also concluded that age has had a relatively weak impact on attitude and intention towards the acceptance of new technology. The effect of gender has been identified as important in internet business as it is seen as male

dominated in Saudi Arabia. Literature also suggests that prior experience of computers impacts on consumer beliefs and attitudes toward related systems and technology. These studies suggest also that prior experience of technology has greater effect on attitudes than demographic characteristics. In this regard, the more experience a consumer has about technology, the better understanding the consumer will have about new technologies. Consumer behaviour literature suggests that reference group often impacts on consumer behaviour. However, banking is claimed to be extremely personal in the sense that it is seen as independent from other people's example or influence.

Attitudes and motives are among the fundamental factors influencing consumers' buying behaviour and have, therefore, attracted considerable attention from researchers probing the behaviour of bank customers and their relationship with these institutions. In the context of technologically based distribution channels, attitudes and motives have generally been used as segmentation variables to define distinct customer groups whose attitudinal profiles showed similarities within the group. Using 11 attitudinal dimensions concerning technology and information, Machauer and Morgner (2001) quoted by Akinci et al. (2004), defined four clusters of German bank consumers. These were "transaction oriented", "generally interested", "service oriented", and "technology opposed" groups. In the USA, Barczaket al. (1997) studied the consumer motives for use of technologically based banking services and distribution channels and found that customers could be clustered on their money management philosophies. Their results describing four motivational clusters including "security conscious", "maximizers", "instant gratification",

and “hassle avoiders” revealed that the four motivational segments had different attitudes and behaviours towards different banking technologies. In Finland, Karjaluoto et al. (2002) found that attitude towards online banking and actual behaviour was both influenced by prior experience of computers and technology as well as attitudes towards computers.

## 2.7 THE TECHNOLOGY ACCEPTANCE MODEL (TAM)

The adoption of ICT (including mobile banking) remains complex and elusive, yet an extremely important phenomenon and many studies have empirically examined its determinants. Adoption of IT/ICT has been extensively studied across academic disciplines from psychology to communications to IS. The Technology Acceptance Model (TAM), frequently employed by IS scholars, is a model specific to IT adoption that focuses on two discrete beliefs: perceived usefulness (PU) and perceived ease of use (PEOU) (Rouibah, 2008). Recently, Venkatesh and Davis (2000) quoted by Rouibah (2008) integrated the construct of subjective norms into the TAM model to yield an updated “TAM 2” model. This expanded version of the Technology Acceptance Model (TAM) is used to test the impact of four factors (subjective norms, perceived ease of use, perceived usefulness, and perceived enjoyment) on the level of IT usage by customers. A critical review of TAM recently argued that there is a need to include other constructs in order to gain a broader view and a better explanation of ICT adoption. It is argued that factors related to human and social change processes should be incorporated into TAM. In recent years, IS researchers have urged that traditional models of IT adoption be expanded

to include factors such as intrinsic motivation or "enjoyment" to help explain IT adoption and usage (see Heijden, 2004). Others suggest that researchers should also account for the influence of perceived user resources – which has recently been used to analyze IT adoption in developing countries. In his study which explores and compares customer value perceptions in internet and mobile banking, Laukkanen, (2007), observes that efficiency, convenience and safety are salient in determining the differences in customer value perceptions between internet and mobile banking.

### *2.7.1 Theory of Technology Acceptance Model*

1. The target of this model is to predict the acceptance of customers, the model (TAM) more specifically with the prediction of the acceptable Davis (1986) as well as identify the modifications that must be imported to the system in order to make it acceptable to users. The model relies on the two critical factors can determine the acceptability of an information system, those factors are: perceived usefulness and perceived ease of use.
2. The usefulness can defined as a degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless. Several analyses demonstrated that perceived usefulness and perceived ease of use can be considered as two different dimensions (Hauser et Shugan, 1980 ; Larcker et Lessig, 1980 ; Swanson, 1987).

The theory of Technology Acceptance Model inferred that the behavioural purposes identify the use of an information system. However, the behavioural purpose is identified by the person's approach towards the use of the system and his perception of its utility. According to Davis, the attitude of an individual is based on the impact which it may have on his performance, not the only factor that determines his use of a system. Therefore, even if the staffs do not like an information system, the possibility that they are going to use it is high if they convince that the system is going to improve their performance at work. Beside that, the Technology Acceptance Model hypothesizes a direct link between perceived usefulness and perceived ease of use. With two different systems recommend same advantages, the client is going to find more useful than that one who find is easier.

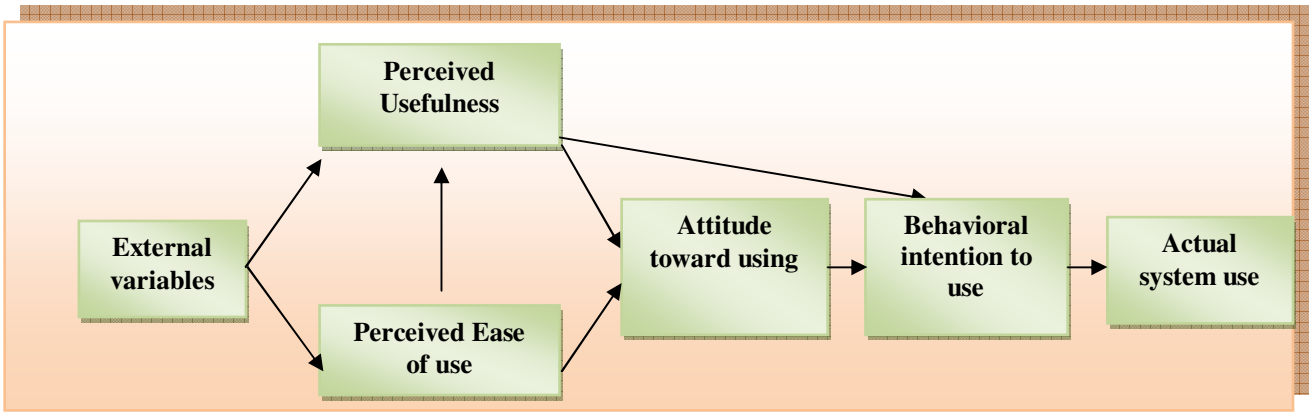


**Figure 2.1: Theory of Technology Acceptance Model**

Perceived ease of use according to Davis (1986) also influences in a significant way the attitude of an individual through two main mechanisms: self-efficacy and instrumentality. Self-efficacy is a new concept improved by Bandura (1982) which explains that the most system is easy to use. Furthermore, an instrument that is very easy to use will make the person feels that he has a control on what he has done. (Lapper 1985). Efficacy is one of

the basic factors underlying intrinsic stimulus (Bandura 1982; Lapper 1985) and what we have shown here is the direct link between perceived ease of use contribution in instrumental way in developing a person's performance.

According to this model, we can predict the factor which affects the user is the efficacy of an instrument. However, it is interesting to note that the research presented by Davis (1989) to legalize his model, demonstrates that the strong link between the intention to use the information system and perceived efficacy are stronger than perceived ease of use.

However, in this model, the design of system characteristics does not account for social effects in the utilization and adoption of new information system. A new research on IS usage and acceptance suggest that TAM has as one of the most effects models in this stream of research. The TAM represents a significant theoretical contribution to understand IS acceptance and IS usage behaviours.

### *2.7.2 Theory Diffusion of Innovation*

The theoretical grounding for this research derives from the technology acceptance model (TAM). TAM, proposed by Davis (1989) to explain and predict end-user acceptance of information systems (IS) has been validated across a broad range of research settings on different information technology (IT) applications over time. TAM is an extension of the Theory of Reasoned Action (TRA), developed by Fishbein and Ajzen (1977) to describe the psychological determinants of behaviour. According to TRA, an individual's performance of a specific behaviour is determined by his/her behavioural intentions (BI),

which are a function of individual attitudes (ATT) (the person's feelings that performing the behaviour is good or bad) and subjective norms (the person's beliefs that certain individuals or groups approve or disapprove of performing the behaviour) (Fishbein and Ajzen, 1975, p. 301)

## 2.8 IMPORTANT FACTS ABOUT SAUDI ARABIA

Some of the GCC countries have emerged as forerunners in the Arab region and are among the 50 top information technology (IT) users in the world, based on the classification issued by the US' IDC Group. In its global Information Society Index (ISI) for 2004, the World Times/IDC ISI ranks the UAE 32nd, and Saudi Arabia 47th overall out of 53 countries, by evaluating 23 indicators measuring the capacity of a nation's citizenry to exchange information internally and externally (Shalhoub, 2006). These 23 indicators are classified into four different categories: (1) computer infrastructure; (2) internet infrastructure; (3) information infrastructure; and (4) social infrastructure (Shalhoub, 2006). All indicators, then, point to the fact that the GCC countries are ready to engage in e-commerce transactions.

There is a paucity of knowledge about what factors influence ICT acceptance and use in the Arab world. Although studies of ICT adoption and use in Arab countries are beginning to emerge, just a few have used established theories, such as TAM. Those that have used TAM have applied it to study IT usage in workplace settings; however, its application to

social settings in the Arab world has not been established. It is certainly possible that TAM may not apply to Arab users or may produce different results in the context of a type of ICT usage. In addition, many studies have shown that cultural beliefs and norms play a significant role in ICT adoption in the Arab region. Hill et al.(1998) cited in Rouibah (2008) found that culture beliefs and technological culturation (i.e. cultural exposure and the experiences that individuals have with technology originally developed in other countries) affect IT transference to Arab countries. These factors have an influence on the ease with which new forms of ICT can be transferred from "western" cultures to the Arab world.

### *2.8.1 The Arab Culture And Islam*

Arab culture is influenced by Islam which governs the customs and daily life of Arab people. Arab culture also emphasizes politeness and modesty – prohibiting social contact between men and women before marriage; therefore, overt discussion of love and sexual matters, as well as social contact (including conversation) between unrelated men and women are publicly discouraged. The availability of new ICTs may challenge these traditional barriers. This may explain why Hill et al. (1998) cited in Rouibah (2008). found that religious values tend to reinforce resistance to IT transfer among Arab people, particularly among individuals who associate ICT with foreign influences on the Arab social structure, such us encouraging communication between unrelated men and women. Moreover, the emphasis on politeness in Arab societies means that direct criticism is not favorably viewed. In summary, adoption of various forms of ICT is influenced by a

multitude of factors including perceived ease of use (PEOU), perceived usefulness (PU), subjective norms (SN), and perceived enjoyment (PE) (Rouibah ,2008).

Financial services delivery and consumption has experienced major changes during the last years. Technological development has reshaped the business environment. The banking industry is among the leading sectors in adopting and utilising the internet and mobile technology on consumer markets and consequently its service delivery has undergone changes unprecedented in its history. The development of electronic banking services via multiple electronic channels has made it possible to provide new kinds of added value for customers. Applying the internet with solely focusing on cost reduction may lead to high supply chain effectiveness while potential customer value opportunities may be ignored (Laukkanen, 2007)). Therefore, understanding service user behaviour and value perceptions is one of the fundamental requisites of service development. Customers have become less willing to visit traditional branches, less loyal, more receptive to new electronic channels and more sophisticated in demanding better service quality including 24 hour service availability. The simultaneous and increasing diffusion of mobile phones and especially WAP-enabled devices has made the transformation of banking applications to mobile devices a logical development in electronic banking (Laukkanen, 2007). Indeed, mobile banking has emerged as a wireless service delivery channel providing increased value for customers' banking transactions. However, despite its many advantages, the use of mobile phones in banking services is still in its infancy. Thus the use of SMSe banking is still in its initial stage and more research in the field is needed. The objective of

qualitative studies is not to find results that can be generalized but instead to gain a deeper understanding of the phenomenon explored.

## 2.9 SUMMARY

The different literatures that were available on the use of mobile devices for banking purpose were discussed in this chapter. The technologies and the behaviour of people toward the technologies were also discussed. This is very important in order to measure the usage of the mobile devices in a region. The measuring variables are important in order to get the desired result in a study like this.

# CHAPTER 3

# RESEARCH METHODOLOGY

## 3.1 INTRODUCTION

This chapter presents the methodology that was adopted in this study. In the following sections of the chapter, we detailed out the rational for the methodology, the research framework, the hypothesis for the study, the domain of survey and the measuring instrument used in the study is discussed.

## 3.2 RESEARCH PURPOSE

Research can be categorized into different types depending on the nature of the purpose or research problem. The purpose of the academic research can be exploratory (ambiguous problem), descriptive (aware of problem), or explanatory (clearly defined problem) (Yin, 1994; Zikmund, 2000). Saunders et al. (2000) argue that more than one purpose can be employed in a study Yin (1994) highlights that the boundaries between the categories are not always clear.

The starting point of our research purpose is the research problem, what are the factors influencing adoptions of SMS banking, depending on research problem literature review

has been conducted in order to specify research questions and construct framework. The research purpose and research question reveal that this study is primarily descriptive.

## 3.3 RESEARCH APPROACH

Qualitative and quantitative methods are two broad approaches to research, and are two research approaches often used in social science research studies . While quantitative research involves numerical representation and manipulation observation for the purpose of describing and explaining the phenomena that those observation reflect ,qualitative research on the other hand involves non-numerical examination and interpretation of observation for the purpose of discovering the underlying meaning and pattern of relationships. Qualitative research emphasis the process and meaning that are not rigorously examined or measured, in term of quantity, amount of intensity or frequency. In contrast, quantitative study emphasis measurement and analysis of causal relationships between variables, not processes (Casebeer and Verhoef, 1997; Zikmund, 2000; McDaniel and Gates, 1996; Miles, 1994; Easteby-Smith, 1991).

In quantitative research variables and relationships are the central idea (Neuman, 2003)

Quantitative research is useful in providing detailed planning pnor to data collection and analysis, because it provided tools for measuring concepts, planning design stages and for dealing with population and sampling issues. In addition, a quantitative research approach utilizes a deductive model in testing the relationship between variables and to provide evidence for or against pre-specific hypothesis (Neuman, 2003).

**Table 3-1**: Quantitative vs. Qualitative research. Source: Chisna1, 1997

| | **Qualitative Research** | **Quantitative Research** |
|---|---|---|
| Objective | To gain qualitative understanding of underlying reasons and motivations | To quantify the data and generalized results from sample to the population of interest |
| Sample | Small number of non-representative cases | Large number of representative cases |
| Data Collection | Unstructured | Structured |
| Data Analysis | Non-statistical | Statistical |
| Outcome | Develop an initial understanding | Recommend a final course of action |

The main object of this study is to find factor influencing the adoption of SMS banking. For achieving this, we have chosen a structured framework and developed our research hypothesis. We are going to analyze the data collected from sample customers and generalize the data to population. So this theory will be tested by using quantitative research method.

When deciding what research approach to adopt, Saunders el al. (2000) suggest number criteria. The first and perhaps the most important criterion is the nature of the research topic. If there is a lot of literature about the topic from which a theoretical framework can be defined.

It is often suitable to use the deductive approach .In opposition, when researching a topic that is new and little existing literature can be found, it may be more appropriate to use an inductive approach. The time available for the study is another factor that needs to be considered. Inductive research is often more time consuming because it is based on a longer period of data collection and analysis, and the ideas emerge gradually. The risk involved can also be an issue. The inductive research approach involves the risk that no useful data pattern and theories will emerge. The deductive research approach is usually a lower risk strategy. Even though there are some risks, such as non-return of questionnaires.

This study is deductive, because theories exist within the area and conclusion were drawn from theories. The deductive research approach is also appropriate because of the limited time available for this study and the lower risk involved

## 3.4 THEORETICAL FRAMEWORK

The most important area of research in this field has also been done to discover the main variables that affect how strong and reliable the factors and the SMS banking adoption relationship truly are. This underpinning theory related to the adoption of SMS Banking will explore the following questions:

- Are those factors a true predictor of adoption?
- Is either of the proposed models valid and is any one better than another?
- What factors affect the SMS banking adoption among Saudi Arabia costumers?

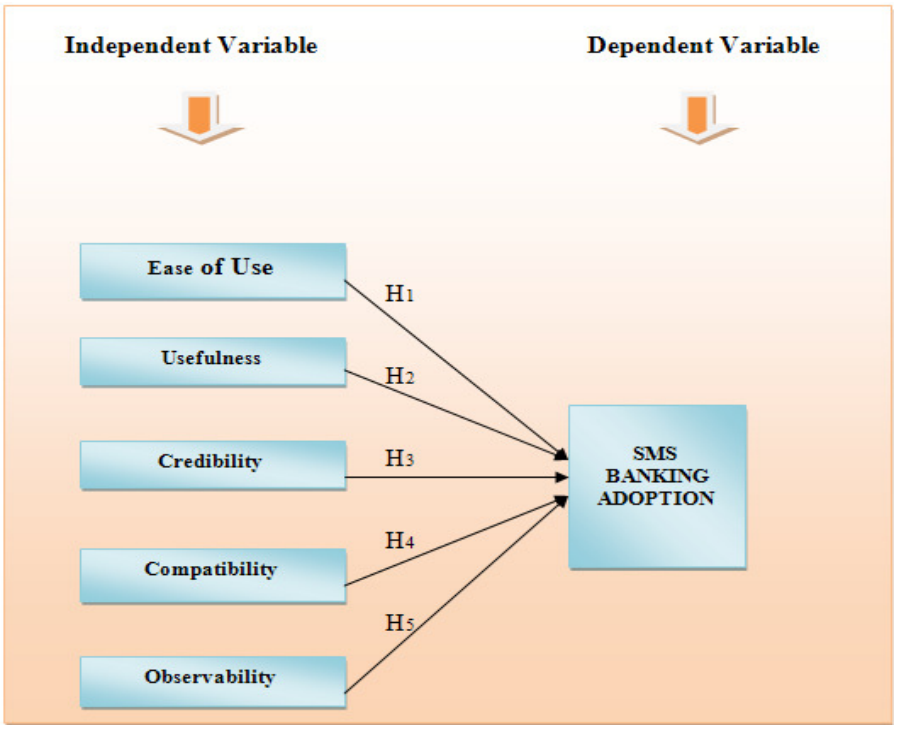


**Figure 3.1 Research Framework**
**Study of SMS Banking Adoption in Saudi Arabia**

## 3.5 RESEARCH HYPOTHESES

Based on the relationship of the variables described in the theoretical framework the following hypotheses were developed. Hypotheses developed in this study **are:**

**H1**: There is a relationship between ease of use and SMS banking adoption

**H2**: There is a relationship between usefulness and SMS banking adoption

**H3**: There is a relationship between credibility and SMS banking adoption

**H4**: There is a relationship between compatibility and SMS banking adoption

**H5**: There is a relationship between observability and SMS banking adoption.

## 3.6 RESEARCH STRATEGY

The research strategy depends on characteristics of the stated research question.

The main goal of this study is to find the factors influencing adoption SMS banking from customer point of view, the study focuses on contemporary event, does not require control over behavioral events and the research question of this study is in form of what, so the most appropriate strategy is survey.

## 3.7 SAMPLING AND POPULATION

The population of interest was defined as a group of Bank's customers who use SMS banking. Since, we were interested in the concept of intention of the respondents as users of SMS banking.

We limited our sampling frame so data collection was conducted in some bank in Saudi Arabia, from 15/09/2009 to 24/09/2009.

**Table 3-2** Summary

| | |
|---|---|
| Elements | users of SMS banking |
| Sampling Unit | Some Banks in Saudi Arabia |
| Duration | 10 days from 15/09/2009 to 24/09/2009 |

### 3.7.1 Selecting the Sampling Technique

Traditional sampling method can be divided into two categories: (Saunders et al., 2000)

- Probability
- Non-probability

Probability sampling is the most commonly associated with survey -based research where researcher needs to make inferences from the sample about a population to answer the research questions or to meet research objectives (Saunders et al., 2000).In probability sampling, sampling units are selected randomly.If done properly, probability sampling ensures that the sample is representative (Hair et al., 2003).

Non-probability sampling provides a range of alternative technique based on researcher subjective judgment (Saunders et al., 2000). In non-probability sampling the selection of elements for the sample is not necessarily made with the aim of being statistically representative of the population. Rather the researcher uses the subjective methods such as personal experience, convenience, expert judgment and so on to select the elements in the sample. As a result the probability of any elements of the population being chosen is not known (Samuel et al., 2003).

According to Samuel et al., 2003 most non-probability sampling methods are:

Convenience Sampling: Convenience sampling involves select sample members who can provide required information and who are more available to participate in the study. Convenience sample enables the researcher to complete a large number of interviews cost effectively and quickly but they suffer from selection bias because of difference of target

population (Hair et al., 2003).

Quota Sampling: Objective of quota sampling is to have proportional representation of the strata of the target population for the total sample and the certain characteristics describe the dimension of the population (Cooper and Schindler, 2003). In quota sampling the researcher defines the strata of the target population determines the total size and set a quota for the sample elements from each stratum. The finding from the sampling cannot be generalized because of the choice of elements is not done using a probability sampling methods (Samuel et al., 2003).

The Objective of this research is to find factors influencing the adoption of SMS Banking. Since in this study, we want to generalize result to Users of SMS banking in the population, so the Non **probability** sampling method of judgment sampling is ended.

### 3.8 MEASUREMENT OF CONSTRUCTS

The main goal of this study is to find out the factors influencing the adoption of SMS banking from customer point of view. As we mentioned before survey is the strategy of this research. Based on extended literature review we have developed an appropriate research construct which had been validated in prior studies. Following table presents constructs and their corresponding measurements sources used for questionnaire.

**Table 3-3**Definition of constructs

| Construct | Definition | Source |
|---|---|---|
| Attitude | The person positive or negative feeling about internet banking adoption | Davis et al., Taylor and 1995 |
| Subj ective | Represent the degree to which a person perceives that it is important for others to believe He/ she should use internet banking | Taylor and Todd, 1995 |
| Facilitating Condition | The degree to which a person believes that the required resources exists to support the use of internet banking | Thompson et al., 1991; Triandis, 1979 |
| Self Efficacy | The degree to which a person's self-confidence in her/his ability to use internet banking. | Bendura, 1977 |
| Perceived Usefulness | The degree to which a person believes that the using internet banking would enhance her/his job performance | Davis et al., 1989 |
| Perceived Ease of Use | The degree to which a person believes that Using the internet banking would be free of effort | Davis et al., 1989 |
| Trust | Trust refers to the belief that the promise of another can be relied upon and that, in unforeseen circumstances, the other will act in a spirit of goodwill and in a benign fashion toward the trustor. Trust has three characteristics: ability, benevolence, and integrity. | Mayer et al ., 1995 |
| Intention | A person is readiness to adopt internet banking | Davis et al., 1989 |

It should be mentioned that both Subjective norms and behavioral control were measured with formative items resulting from review of the relevant literature.

According to Ajzen the construct of perceived behavioral control reflects beliefs regarding the availability of resources and opportunities for performing the behavior as well as the existence of internal/external factors that may impede the behavior. Hence, we agree with Taylor and Todd's decomposition of perceived behavioral control into "facilitating conditions" and the internal notion of individual "self-efficacy".

Bhattacherjee's definition is that: "External influence refers to mass media report, expert opinion, and other non-personal information considered by adopter in making a "rational" acceptance decision, while inter personal influence refers to word-of-moth influence by friend colleague, superior and other prior adopters known to potential adopter" (Bhattacherjee, 2000).

Bhattacherjee (2000) stated that both inter-personal and external influence have influence on subjective norms.

Measurement of inter-personal and external influence adopted from Todd and Taylor (1995), Bhattacherjee (2000) and Khalifa and Limayem (2003).

### 3.9 QUESTIONNAIRE

The questionnaire was take in from Lockett A. and Littler D. (1997) "The Adoption of Direct Banking Services", *Journal of Marketing Management*, 13, 791-811.

In this study, The final questionnaire consists of two sections. The first section gathers general information about respondent like age, occupation, gender, age ... The second section is about perception of respondent about internet banking. The five point likert scale is used for statements of the second section ranging from "1" for strongly disagree, "2" disagree, "3" for no opinion, "4" agree, "5" for strongly agree.

### 3.10 DATA COLLECTION TECHNIQUE

On this study data was collected that survey method. As we mentioned before the main goal of this study is to found factors influencing the adoption of SMS banking from customer point of view. Sample was taken randomly from customer whom using of SMS banking. Data collection was conducted in some Saudi Arabia bank, from the 15/09/2009 to the 24/09/2009.Toatal number of distributed questionnaire was equal to 125, from which 25 were incomplete so the sample size of this study was 100.

### 3.11 QUALITY STANDARD: VALIDITY AND RELIABILITY

In order to reduce the possibility to getting wrong answer, attention need to be paid to: Reliability and validity (Saunders and Thornhill, 200

### 3.11.1 Reliability

Reliability can be defined as the degree to which measurements are free from error and, therefore, yield consistent results. Operationally, reliability is defined as the internal consistency of a scale, which assesses the degree to which the items are homogeneous. Reliability can be assessed y the following questions (Easteby-Smith et al., 1991).

1. Will the measures yield the same results on other occasions?
2. Will similar observation be reached by other observers?
3. Is there transparency in how sense was made from row data?

For reflective measures, all items are viewed as parallel measures capturing the same construct of interests. Thus, the standard approach for evaluation, where all path loadings from construct to measures are expected to be strong (i.e., 0.70 or higher), is used. In the case of formative measures, all item measures can be independent of one another since they are viewed as items that create the "emergent factor." Thus, high loadings are not necessarily true and reliability assessments such as Cronbach's alpha are not applicable. Under this situation, Chin (1998) suggests that the weights of each item be used to assess how much it contributes to the overall factor. For the reflective measures, rather than using Cronbach's alpha, which represents a lower bound estimate of internal consistency due to its assumption of equal weightings of items, a better estimate can be gained using the composite reliability formula (Chin, 1998).

So Measure reliability was assessed using internal consistency scores, calculated

by the composite reliability scores (Werts et al., 1974).

Internal consistencies of all variables are considered acceptable since they exceed .70, signifying tolerable reliability.

### 3.11.2 Validity

Validity is concerned with whether the findings are really about what they appear to be about. Validity is defined as the extent to which data collection methods or methods accurately measure what they were intended to measure (Saunders and Thornhill, 2003).

The two elements convergent validity and discriminant validity are components of a larger scientific measurement concept known as construct validity (Straub et al., 2004). These two validities capture some of the aspects of the goodness of fit model, i.e., how well the measurement items relate to constructs. When factorial validity is acceptable, it means each measurement item correlates strongly with the one construct it is related to, while correlating weakly or not significantly with all other constructs.

Convergent validity is shown when each measurement item correlates strongly with its assumed theoretical construct.

The ideal level of standardized loadings for reflective indicators 0.7 but 0.6 considered to be an acceptable level (Barclay et al., 1995).

### 3.12 Data Analysis Technique

The purposes of data analyses and hypotheses testing, several statistical methods were employed from SPSS software version 16. These include descriptive statistics to describe the characteristics of the respondent, test of differences to compare the extent of attitude towards the respondents between different demographic profiles, correlational analyses to describe the relationship between variables and regression analyses to test the impact of independent variables on dependent variables.

The statistical software SPSS 16.00 version will be employed to examine the data in a comprehensive manner. Both simple and advanced statistical tools and methods were used where appropriate for analyzing the relationship among the variables and the model. Therefore usage of statistical techniques will of according to commonly accepted research assumptions and practices.

Following statistical analysis, we will perform the data analysis for this study. Among the analysis method that will be use in SPSS are reliability test, correlation, linear and multiple regression analysis. Multivariate technique of statistical data analysis will determine the adoption level of SMS Banking in Saudi Arabia.

## 3.13 SUMMARY

This chapter explained the methodology applied in this study. The study was carried out in phases which are the rational for the methodology, the research framework analysis, design of the research instrument, and the techniques used to analyze the data in evaluate the use of the SMS/mobile banking in Saudi Arabia. The findings and results from the application of the measuring instrument developed here are discussed in the next chapter.

# CHAPTER 4

# DATA ANALYSIS AND RESEARCH FINDINGS

## 4.1 INTRODUCTION

In this chapter the results of the statistical analysis will be presented. The statistical analysis has been done by SPSS software, the discussions of the research findings will be based on the research objectives and hypotheses that have been identified in the study, it will be discussing relationship between ease of use, usefulness, credibility, compatibility and observability in internet banking adoption, then some suggestion will be given according to the results.

## 4.2 GENERAL INFORMATION

A total of 100 questionnaires were gathered from the survey for the purpose of this study. In these questionnaires, we asked for some general information from the customers. (**Table 4.1**). The result shows that the most active customers are the ones between 20 and 35 and are university graduated. Also the results show that most of them a man and have official occupations. This could because of their education

**TABLE 4.1: PROFILE OF RESPONDENTS**

| | Percent | Frequency N=100 |
|---|---|---|
| **Gender** | | |
| Female | **30%** | **30** |
| Male | **70%** | **70** |
| **Age** | | |
| Under 20 | **07%** | **07** |
| 20-35 years | **65%** | **65** |
| 36-50 years | **15%** | **15** |
| 50-65 years | **08%** | **08** |
| above 65 years | **05%** | **05** |
| **Bank Account Holders** | | |
| First year | **07%** | **07** |
| Second years | **05%** | **05** |
| Third years | **15%** | **15** |
| More than 4 years | **73%** | **73** |
| **Using SMS Banking** | | |
| 2-4 years | **90%** | **90** |
| 5-7 years | **10%** | **10** |
| Less than 1 month | **00%** | **00** |
| More than 8 years | **00%** | **00** |
| **Occupation** | | |
| Occupying | **80%** | **80** |
| Not occupied | **05%** | **05** |
| Free market | **15%** | **15** |
| **Income** | | |
| <1000 SAR | **05%** | **05** |
| 2000-4000 SAR | **06%** | **06** |
| 5000-8000 SAR | **09%** | **09** |
| >8000 SAR | **80%** | **80** |
| **Education** | | |
| Diploma | **04%** | **04** |
| First Degree | **03%** | **03** |
| Master | **88%** | **88** |
| PhD | **05%** | **05** |

From the table above, it could be noted that **70%** of the respondents are males, and **30%** females. The largest group in terms of age is those aged between 20 and 35 (**65%**). In terms of Using Bank Account, the majority of the respondents (**73%**) were account bank holders before 4 years, **15%** before 3 years, **05%** before 2 years, and **07%** before 1 year. Regarding the education, the largest group (**88%**) was a master holder, (**04%**) Diploma holders, (**03%**) first degree holders, (**05%**) PhD degree holders, as for their level of income, (**06%**) of the respondents received monthly salary ranging from SAR2000 to SAR4000, (**09%**) were SAR5000 to SAR8000, > SAR1000, and (**80%**) more than SAR8000 and above monthly. Finally in terms of the nature of occupation, it was found that (**80%**) of the respondents were occupying, (**05%**) were not occupied, and **15%** has free market.

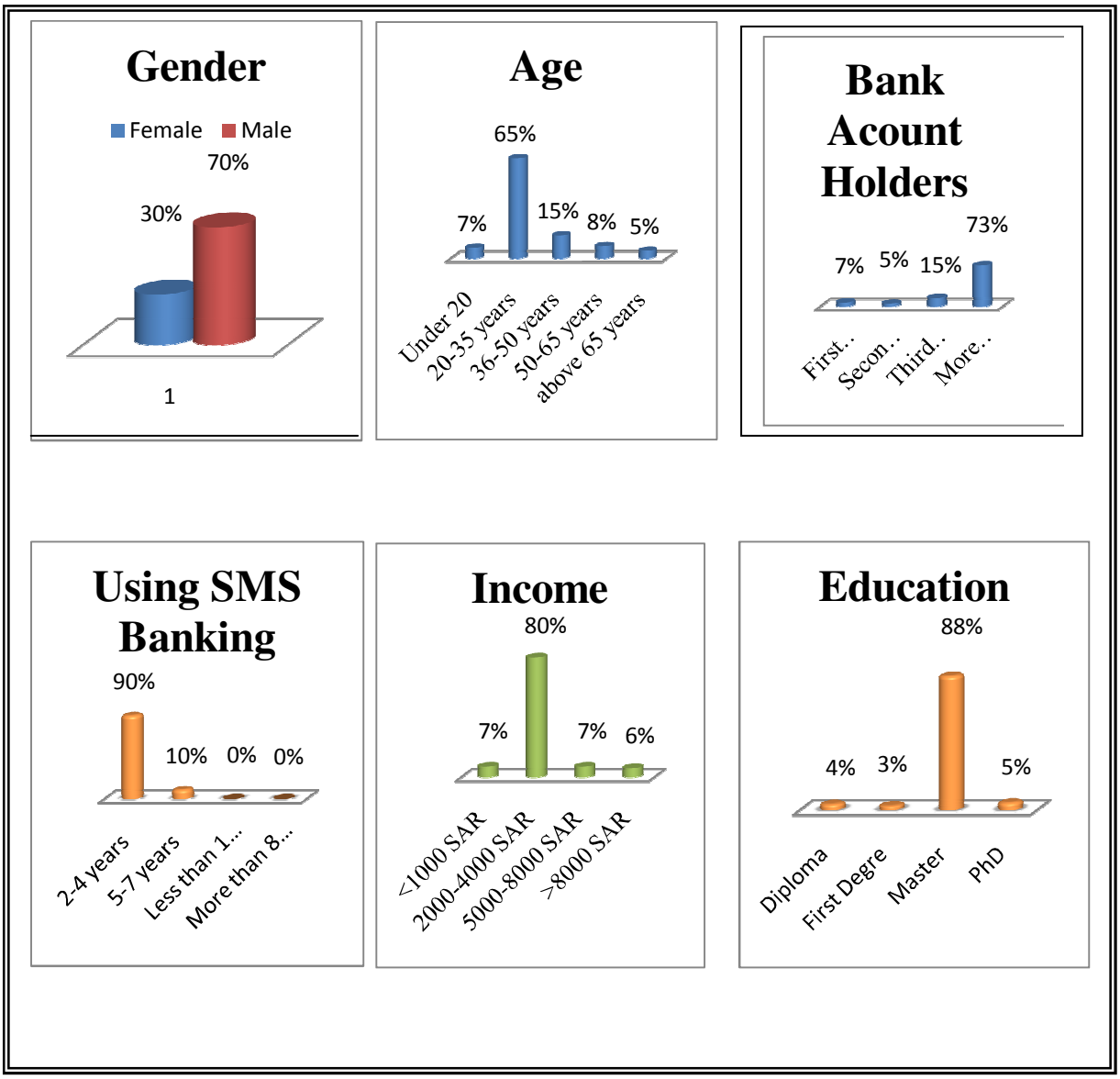


**Figure 4.1: Demographic Data**

## 4.3 RELIABILITY ANALYSIS TEST

Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials (Writing guides, 2009). Also reliability, simply, could be defined as the degree to which measures are free from error and therefore, yield consistent results (Zikmund, 2003).

There are a number of different reliability coefficients such as Split half reliability, Guttman, Parallel, Strictly parallel and Cronbach's alpha. One of the most commonly used is Cronbach's alpha because it can be interpreted as a correlation coefficient and ranges in value from 0 to 1 (Coakes and Steed, 2003). Therefore, in this study, Cronbach's alpha was used as a measurement of reliability for each variable.

**Table 4.2: RESULTS OF RELIABILITY TEST**

| Variables | No. of Items | Cronbach's Alpha |
|---|---|---|
| **EASE OF USE** | 7 | **.693** |
| **USEFULNESS** | 7 | **.708** |
| **CREDIBILITY** | 7 | **.689** |
| **COMPATIBILITY** | 7 | **.613** |
| **OBSERVABILITY** | 7 | **.882** |

From the analysis done on the instruments listed under each variable in the questionnaire, **Table 4.2** shows that Cronsbach's Alpha for the variables ease of use, usefulness, credibility, compatibility, and observability are **0.693, 0.708, 0.689, 0.613** and .**882** respectively. The internal consistency reliability of the measures can be considered as good and ideal as it achieved more than **0.6** alpha values.

## 4.4 DESCRIPTIVE STATISTICKS

The first step in the analysis of multivariate data is a table of means and standard deviations (Genser et al., 2007). In a multiple regression analysis, these scores may have a large "influence" on the results of the analysis and are a cause for concern. Table 4.3 shows means and standard deviations which were computed using SPSS.

**Table 4.3Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| EOU | 100 | **3.57** | **4.71** | **4.1095** | **.25415** |
| USE | 100 | **2.86** | **4.86** | **4.0405** | **.48291** |
| CRE | 100 | **3.43** | **4.71** | **4.0024** | **.27396** |
| COM | 100 | **3.43** | **4.57** | **4.0238** | **.28349** |
| OB | 100 | **3.57** | **4.57** | **4.1190** | **.25659** |
| ADOP | 100 | **59.70** | **93.00** | **82.3233** | **6.47314** |
| Valid N (listwise) | 100 | | | | |

Based on the above table, the mean values of the variables could be described as the following

Independent Variables:

- The mean value of EASE OF USE was (**4.1095**). This indicates that the EASE OF USE was high as the minimum value was (3.57) and the maximum was (4.71).
- The mean value of USEFULNESS was (**4.0405**), this indicates that the USEFULNESS was high as the minimum value was (**2.86**) and the maximum was (**4.86**).
- The mean value of CREDIBILITY was (**4.0024**), this indicates that the CREDIBILITY was high as the minimum value was (**3.43**) and the maximum was (**4.71**).

- The mean value of COMPATIBILITY was (**4.0238**), this indicates that the COMPATIBILITY was moderate as the minimum value was (**3.43**) and the maximum was (**4.57**).
- The mean value of OBSERVABILITY was (**4.1190**), this indicates that the OBSERVABILITY was moderate as the minimum value was (**3.57**) and the maximum was (**4.57**).

Dependent Variables

- The mean value of CONSUMER ADOPTION OF SMS BANKING was (**82.32%**), this indicates that the CONSUMER ADOPTION OF SMS BANKING is high as the minimum value was (**59.70%**) and the maximum was (**93.00%**).

## 4.5 PEARSON CORRELATION ANALYSIS

Pearson correlation matrix will indicate the direction, strength and significance of the bivariate relationships among the variables in the study. The following Tables show the correlations between adoption and five influent factors.

### 4.5.1 Correlation between Adoption SMS banking and Ease of use

**Table4.4:** Correlation between Adoption SMS banking and Ease of use

| | | ADOP | EOU |
|---|---|---|---|
| ADOP | Pearson Correlation | 1 | .322(**) |
| | Sig. (1-tailed) | . | **.006** |
| | N | 100 | 100 |
| EOU | Pearson Correlation | .322(**) | 1 |
| | Sig. (1-tailed) | .006 | . |
| | N | 100 | 100 |

** Correlation is significant at the 0.05 level (1-tailed).

From table 4.4 it could be noted that, Ease of use has a positive significance correlation (**.322**) with Adoption SMS banking.

### 4.5.2 Correlation between Adoption SMS banking and Usefulness

**Table4.5:** Correlation between Adoption SMS banking and Usefulness

| | | ADOP | USE |
|---|---|---|---|
| ADOP | Pearson Correlation | 1 | .275 |
| | Sig. (1-tailed) | . | .042 |
| | N | 100 | 100 |
| USE | Pearson Correlation | .275 | 1 |
| | Sig. (1-tailed) | .042 | . |
| | N | 100 | 100 |

From table 4.5 it could be noted that, Usefulness has a positive significance correlation (**.275**) with Adoption SMS banking.

### 4.5.3 Correlation between Adoption SMS banking and Credibility

**Table4.6:** Correlations between Adoption SMS banking and Credibility

| | | ADOP | CRE |
|---|---|---|---|
| ADOP | Pearson Correlation | 1 | -.108 |
| | Sig. (1-tailed) | . | **.205** |
| | N | 100 | 100 |
| CRE | Pearson Correlation | -.108 | 1 |
| | Sig. (1-tailed) | **.205** | . |
| | N | 100 | 100 |

From table 4.6 it could be noted that, surprisingly, Credebility has a negative significance correlation (-**.108**) with Adoption SMS banking.

### 4.5.4 Correlation between Adoption SMS banking and Compatibility

**Table4.7:** Correlation between Adoption SMS banking and Compatibility

| | | ADOP | COM |
|---|---|---|---|
| ADOP | Pearson Correlation | 1 | -.19 |
| | Sig. (1-tailed) | . | .028 |
| | N | 100 | 100 |
| COM | Pearson Correlation | -.19 | 1 |
| | Sig. (1-tailed) | . 028 | . |
| | N | 100 | 100 |

From table 4.6 it could be noted that, Compatibility has a negative significance correlation (-**.19**) with Adoption SMS banking.

### 4.5.5 Correlation between Adoption SMS banking and Observability

**Table4.8:** Correlation between Adoption SMS banking and Observability

| | | ADOP | OB |
|---|---|---|---|
| ADOP | Pearson Correlation | 1 | .272(*) |
| | Sig. (1-tailed) | . | .018 |
| | N | 100 | 100 |
| OB | Pearson Correlation | .272(*) | 1 |
| | Sig. (1-tailed) | .018 | . |
| | N | 100 | 100 |

From table 4.8 it could be noted that, Observability has a positive significance correlation (**.272**) with Adoption SMS banking.

## 4.6 HYPOTHESES TESTING

**Table 4.9** Results for test Hypotheses between Customer Adoption SMS banking and ease of use, Usefulness, Compatibility, Observability, credibility.

| Number | Hypothesis | Conclusion | Sig |
|---|---|---|---|
| **H1** | There is a relationship between ease of use and SMS banking adoption. | **Accept** | **0.006** |
| **H2** | There is a relationship between usefulness and SMS banking adoption | **Accept** | **0.042** |
| **H3** | There is a relationship between credibility and SMS banking adoption | **Reject** | **0.205** |
| **H4** | There is a relationship between compatibility and SMS banking adoption | **Accept** | **0.028** |
| **H5** | There is a relationship between observability and SMS banking adoption | **Accept** | **0.018** |

## 4.7 RESULTS OF REGRESSION TEST

### 4.7.1 Multiple Regression Analysis

This section presents an analysis and discussion of the relationship between ADOP as dependent variable and the five independent variables using a multiple regression technique. Regression, in the form of multiple regressions, is one of the most widely used techniques when the research question is to predict a single continuous dependent variable by set of continuous and or categorical independent variables (Genser et al., 2007).

### 4.7.2 Regression between Adoption SMS banking and Ease of use

Linear regression was conducted to investigate how access could influence the Adoption SMS banking. The result is statistically significant p-Value = 0.000, the identified equation in table 4.10 to access the relationship was:

Adoption = 1.325 Ease of use – 0.154

**Table 4.10:** Regression between Adoption SMS banking and Ease of use

| Variable | B | Se. B | ß |
|---|---|---|---|
| Ease of use | 1.325 | .056 | .850 |

Note:$R^2$ = 0.732, Sig.F= .000**p<.05
B= Unstandardized coefficient beta;
Se.B= Standard error of regression coefficient;
ß= Beta coefficient.

The adjusted R squared value was 0.732. This indicates that 73.20 % of the variance in Adoption SMS banking has been significantly explained by the ease of use (**Hypothesis 1 Accepted**).

### 4.7.3 Regression between Adoption SMS banking and Usefulness

Linear regression was conducted to investigate how access could influence the Adoption SMS banking. The result is statistically significant p-Value = 0.012, the identified equation in table 4.11 to access the relationship was:

Adoption = 2.13 Usefulness – 0.03

**Table 4.11:** Regression between Adoption SMS banking and Usefulness

| Variable | B | Se. B | ß |
|---|---|---|---|
| Ease of use | 2.13 | .056 | .214 |

Note:$R^2$ = 0.685 ; Sig.F= .012**p<.05
B= Unstandardized coefficient beta;
Se.B= Standard error of regression coefficient;
ß= Beta coefficient.

The adjusted R squared value was 0.685. This indicates that 68.50 % of the variance in Adoption SMS banking has been significantly explained by the Usefulness (**Hypothesis 2 Accepted**).

### 4.7.4 Regression between Adoption SMS banking and Credibility

Linear regression was conducted to investigate how access could influence the Adoption SMS banking. The result does not statistically significant p-Value = 0.67, $R^2$ = 0.002 that means it does not have a linear relationship between Adoption and Credibility (**Hypothesis 3 Rejected**).

### 4.7.5 Regression between Adoption SMS banking and Compatibility

Linear regression was conducted to investigate how access could influence the Adoption SMS banking. The result is statistically significant p-Value = 0.032, the identified equation in table 4.12 to access the relationship was:

Adoption = 0.85 Compatibility – 1.25

**Table 4.12**: Regression between Adoption SMS banking and Compatibility

| Variable | B | Se. B | ß |
|---|---|---|---|
| Ease of use | 0.85 | .015 | .412 |

Note:$R^2$ = 0.531 ; Sig.F= .032**p<.05
B= Unstandardized coefficient beta;
Se.B= Standard error of regression coefficient;
ß= Beta coefficient.

The adjusted R squared value was 0.531. This indicates that 53.10 % of the variance in Adoption SMS banking has been significantly explained by the compatibility (**Hypothesis4 Accepted**).

### 4.7.6 Regression between Adoption SMS banking and Obeservability

Furthermore, multiple regressions was conducted to determine the best linier relationship of Observability for predicting Adoption SMS banking , The result is statistically significant p-Value = 0.000, the identified equation in table 4.13 to access the relationship was:

Adoption = 3.20 Observability + 0.325.

**Table 4.13**: Regression between Adoption SMS banking and Obeservability

| Variable | B | Se. B | ß |
|---|---|---|---|
| Ease of use | 3.20 | .015 | .0152 |

Note:$R^2$ = 0.896 ; Sig.F= .000**p<.05
B= Unstandardized coefficient beta;
Se.B= Standard error of regression coefficient;
ß= Beta coefficient.

The adjusted R squared value was 0.896. This indicates that 89.60 % of the variance in Adoption SMS banking has been high significantly explained by the Observability (**Hypothesis5 Accepted**).

### 4.8 Summary

Based on the data of 100 respondents, the multi-items measures were subjected to a series of validity and reliability checks. For the multi-item scale, the set of items that correspond

to each theoretical construct was initially subjected to an examination of Cronbach's alpha, item-to-total correlations and regression test.

Thus, all measures appeared to be unidimensional, internally consistent, reliable and valid for analysis of the model. Furthermore, this chapter has examined the relationships between the dependent variable (Customer Adoption Banking) and the independent variables (Ease of use, Usefulness, Credibility, compatibility and observability), the relationship between the dependent variable and the independents variables were conducted by using the correlation analysis and regression analysis, which supported the hypotheses that all the variables have a significance impact on Customer adoption SMS banking. Except the Credibility variable which does not have a correlation/relationship with Customer adoption of SMS banking in Saudi Arabia.

# CHAPTER 5

# DISCUSSION AND CONCLUSION

## 5.1 I NTRODUCTION

The results from our findings through statistical analysis were discussed in this chapter. This research was conducted in an explanatory manner and the factors that reflect the credibility of SMS adoption such as ease of use, usefulness and the credibility were discussed.

## 5.2 SUMMARY

The research problem for this study has been defined as:

"What are the main factors, which influence the adoption of retail SMS banking services?"

In the quest to answer the research question, we extracted the important factors from theories that relates to the adoption of the new technology. The theories of relevance are the acceptance theory (Davis, 1989) and diffusion of innovation theory (Rogers, 1995) including the personal and the behavior of the customers as a characteristic. The research model of this study was designed based on the derived factors. The study focused on the adoption of SMS banking as a mobile banking service, the Lockett and Littler's questionnaire on the adoption of direct banking services (1997) was adapted with some

changes. We drew sample from Saudi bank's customers, adopters and non-adopters of SMS banking inclusive.

The results from the study which were obtained by using bivariate and motivational statistical methods, thus the effective factors in the adoption of the SMS banking were easily extracted using these methods. These factors are inclusive of non- economic relative significance, compatibility and trailability of the service, cost, perceived risk, gender, social character and attitude toward change. From the results, practical implications for the banks could be determined.

## 5.3 CONTRIBUTIONS OF THE RESEARCH

The outcome of the analysis from this research has great implications on the banks in Saudi Arabia, for all local and international banks that have the intention of providing SMS banking services for their customers will benefit from this study. Also, those that are already in the planning phase prior to the implementation of the SMS banking services will benefit the evidence of proportioning of using Lockett and Littler's (1997) model to measure both "personal characteristics of adopters" and "perceived characteristics of SMS banking services". However, it's important to note that the characteristics of Saudi Arabian sample SMS banking services differ. This could bring about differences in the findings

from this study. There are quite a number of studies that have analyzed the characteristics of the adopters of SMS banking and focused on the demographic characteristics.

## 5.4 DISCUSSION AND RECOMMENDATIONS

The needs of the Information System practitioners is one of the first steps in performing applied research, the identification of the issue in this study made us to mark some of the important factors like easy of the use and the usefulness in taking the decision to adopt SMS banking in Saudi Arabia.

The following section discusses the level of SMS banking usage and the factors that influence its adoption amongst the Saudi Arabian customers in details. About 90% of the respondents in this study used SMS banking in Saudi Arabia. This shows that the level of the SMS banking adoption is very high, taken into consideration the duration of the use of the service in the country. The collated result of the correlation, the regression and multiple regressions in assessing the variables or the empirical relationship between ease of use, usefulness, compatibility and observability contribute were positively related to SMS banking adoption as hypothesized.

The positive association between combinations among all independent variables (ease of use, usefulness,) was supported. Also from the result the factors that influenced the adoption of SMS banking was supported. The result from the study also shows that the

perceived ease of use and usefulness perceived, compatibility, and observability are important determinant of the customers SMS banking adoption.

Thus the studies of Agrawal &and Pasad (1999) and Wang et al (2003) were supported. Therefore for acceptability and satisfaction of customers using the new mobile channel, the phone interface should be well designed in term of ease of use and increasing the effectiveness in term of higher its usefulness. Customers should be able to communicate and visualize properly with the new mobile channel, with appropriate source and message. It is also important to note that the telecommunication facilities are consistent with needs of customers, the belief, experience, and habits to arise compatibility and observability of the customers have a great positive relationship with the adoption of SMS banking. While presenting the new mobile channel to customers the above stated elements should be taken into consideration.

## 5.5 IMPLICATONS

This study revealed that the mobile Internet relationship between ease of use, usefulness, compatibility, and observability, and SMS banking adoption of customers of Saudi Arabian banks are the major factors that affects the adoption of mobile banks services in Saudi Arabia. Therefore the factors that were identified in this study are all in line with previous studies that were earlier mentioned in this paper.

There are also indicators that there are magnificent efforts on the part of the banks to create greater usage of the SMS banking, its benefits are also quite crucial for the success of the SMS banking services. The level of the activities presently does not surpass that SMS banking is only at a young stage. The demographic differences between SMS bank adopters and the non-adopters were not that evident in this study, particular with the reference to the age and their respective educational background

This could be as a result that the samples of the respondents are already SMS banking adopters and they do have similar features. Therefore in the view of the perceived risk involved and the cost involved in the electronic banking transactions, it was discovered that the more affluent members of the sample seems to have a greater inclination towards m-banking . Also the fact that 90% of the sample of the respondents that had already adopted the m-services is quite encouraging and it is an indication that there a bright future for the m-banking in Saudi Arabia. Nevertheless, there are quite some limitations in this study.

## 5.6 LIMITATION OF THE STUDY

This explanatory research had shed light on some areas, thus revealing some interesting results. We want to would like to state some of the limitations. The limitations imposed on this study are:

1. The sample was limited to Saudi citizens alone, thus the influence on the generalization of the finding on all Saudi Arabian population.
2. The sample size is another limitation. Hence, findings of this study are tentative and needs further verification.
3. Data collection were done during 10 days in September (2009).
4. The investigation is to SMS banking (as electronic banking); which seems to be the last technology in the sector. Therefore, other electronic banking services were not included in this study and results appear to be affected by this issue.
5. Most of recent studies on the adoption of SMS banking services focused on other variables quite less than this study. There could other factors that influence the adoption of SMS banking services but not mentioned on the research.

## 5.7 RECOMMENDATIONS FOR THE RESEARCH

We could conclude by suggestion that the limitation of this study has provided implication for further study. Conducting studies are suggested with random sampling to give a clear image for the factors that influences those Saudi Arabian costumers and to collect more information of the profiled population. Therefore, since the study has studied the SMS banking as a mobile banking, the suggested area for future research is other electronic services provided by Saudi Arabian banks or an improvement on the existing services.

Since this study hinges on the adoption of the SMS banking which had been implemented in the capital city (Alriyadh), it is therefore suggested that future research should be done in other cities in the country. Study with a larger representative from all the regions is suggested for further in-depth analysis while a comparison with the result of this study could be done. An extension could also be made to the retail and corporate customers of SMS banking

Comparison can also be made between the individual, retails, and corporate customers in the terms of the factors that does influence then to adopt any mobile banking services which is already provided by the Saudi Arabian banks. As electronic banking services are just maturing new in Saudi Arabia, another studies that have same purpose in the future could give interesting results. Further study about the implementation of SMS banking in Islamic banks is also recommended.

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# QUESTIONNAIRE

**UNIVERSITI UTARA MALAYSIA**

Dear Participant,

*The general purpose of this research will to find out whether a* ***relationship between usefulness, ease of use, credibility, compatibility, obsevability and the adoption of SMS banking among Saudian customers . The main interest of the survey is to study what factors that influence customers to use e-banking.***

*Your response will be kept as STRICLY CONFIDENTIAL, and for the purpose of academic research only. Thank you very much for your cooperation and prompt feedback.*

Regards,

**ALSAAB SAIF ABDULLAH**
(Faculty of Business Management)
University Utara Malaysia

# SMS BANKING IN SAUDI ARABIA

**(SECTION A):**
**(This section intends to get information the respondents' demographic background).**

(Tick the box which answer is best describing you).

1. Gender
   - ☐ 1. (Male)
   - ☐ 2. (Female)

2. Please state your age?
   - ☐ 1. Under 20
   - ☐ 2. 20-35 years
   - ☐ 3. 36-50 years
   - ☐ 4. 50-65 years
   - ☐ 5. above 65 years

3. Years of Using Bank Account:
   - ☐ 1. First year
   - ☐ 2. Second years
   - ☐ 3. Third years
   - ☐ 4. More than 4 years

4. How long have you been using SMS banking?
   - ☐ 1. Less than 1 month
   - ☐ 2. 2-4 years
   - ☐ 3. 5-7 years
   - ☐ 4. More than 8 years

5. Occupation:
   - ☐ 1. Occupying
   - ☐ 2. Not occupied
   - ☐ 3. Free market

6. Monthly Income

- ☐ 1. <1000 SAR
- ☐ 2. 2000-4000 SAR
- ☐ 3. 5000-8000 SAR
- ☐ 4. >8000 SAR

7. Education Background

- ☐ 1. Diploma
- ☐ 2. First Degre
- ☐ 3. Master
- ☐ 4. PhD

**Definition of scale:**
1 – Strongly Disagree. 2 – Disagree. 3 – Neutral. 4 – Agree. 5 – Strongly Agree.

**Section-A. EASE OF USE**

| | | | | | | |
|---|---|---|---|---|---|---|
| EOU1 | *Assuming I had access to the SMS banking, I intend to use it.* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| EOU2 | *Given that I had access to SMS banking, I predict that I would use it* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| EOU3 | *I will use the SMS banking in the future.* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| EOU4 | *Using the SMS banking improves my task* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| EOU5 | *Using the SMS banking increases my productivity* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| EOU6 | *Learning to utilize SMS would be easy for me* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| EOU7 | *Using the SMS banking enhances my effectiveness in my task* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

**Section-B. USEFULNESS**

| | | | | | | |
|---|---|---|---|---|---|---|
| USE1 | *Using the SMS banking enhances my effectiveness in my task* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| USE 2 | *SMS banking makes the services effective way making.* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| USE 3 | *SMS banking makes the banking transactions faster* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| USE4 | *Getting information from the SMS banking is usefulness for my business* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| USE5 | *I would be willing to run my transaction through SMS banking* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| USE6 | *I find the SMS banking to be useful* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| USE7 | *Using the SMS banking would enable me to accomplish tasks more quickly.* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

**Section-C. CREDIBILITY**

| | | | | | | |
|---|---|---|---|---|---|---|
| CRE1 | *SMS banking has privacy* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| CRE2 | *I feel confident in my activities with SMS banking* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| CRE3 | *When using SMS banking, I am sure that certain managerial and technical procedures exist to secure all the data on this system* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| CRE4 | *SMS Banking has a good security system* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| CRE5 | *I feel safe in my transactions with SMS banking* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| CRE6 | *When using SMS banking, I am sure of the consistency of information processing on this system.* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| CRE7 | *SMS banking has security level using password* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

**Section-D. COMPATIBILITY**

| | | | | | | |
|---|---|---|---|---|---|---|
| COM1 | *I can quickly observe problems with SMS* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| COM2 | *I can quickly decide on alternative strategy through SMS* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| COM3 | *I can decide when to perform my study using SMS* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| COM4 | *Doing things over the SMS is an idea I like* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| COM5 | *SMS has a potential to be an effective education tool* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| COM6 | *I feel the SMS give me inspiration and help me to live up to my best during my study period* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| COM7 | *There should not be any nervous while making education activity using SMS* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

**Section-E. OBSERVABILITY**

| | | | | | | |
|---|---|---|---|---|---|---|
| OB1 | *I think it would be very good to use the SMS for my study activities in addition to traditional methods* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| OB2 | *In my opinion it would be very desirable to use the SMS for my study activities in addition to traditional methods* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| OB3 | *It would be much better for me to use the SMS for my study activities in addition to traditional methods* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| OB4 | *Using the SMS for my study activities is a good idea* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| OB5 | *Overall, I like using the SMS for my study activities* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| OB6 | *I feel confident about learning a new e-mail program if I am neither aided by a competent person* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |
| OB7 | *I feel confident about learning a new text-processing program if I am not aided* | ☐ 1 | ☐ 2 | ☐ 3 | ☐ 4 | ☐ 5 |

## Section-F. CONSUMER ADOPTION IN SMS BANKING

| | | |
|---|---|---|
| IB1 | *Buying things over the SMS is a good idea.* | |
| IB2 | *To do over the SMS banking is a wise idea* | |
| IB3 | *Buying things over the SMS is an idea I like* | |
| IB 4 | *Using the SMS to buy things would be pleasant* | |
| IB 5 | *People who influence my behavior would think that I should buy things over the SMS* | |
| IB 6 | *People who are important to me would think that I should buy things over the SMS* | |
| IB 7 | *I am capable of buying things over the SMS banking* | |
| IB 8 | *Using things over the SMS is entirely within my control.* | |
| IB 9 | *I have the ability to use things over the SMS banking* | |
| IB 10 | *I have the knowledge to buy things over the SMS banking* | |

*Thank You*