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ONLINE BANKING IN BAHRAIN:

ROLE OF ATTITUDES AND BELIEFS IN SHAPING CONSUMER BEHAVIOUR TOWARD ADOPTION

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Dedication

This thesis is dedicated to two special individuals who left their marks on my life. To the memory of my father who believed in his children and my late dear friend Asma Abul. You both will always be on my mind.

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As with all academic endeavours, this research would not have been possible without the help of many people. To begin with, I would like to acknowledge my entire research supervisory team. Dr Maktoba Omar, Director of Studies, who was of great help through every step of this research and whose encouragement and support was the driving force behind the completion of this thesis; Professor John Adams for his academic guidance and willingness to take the time and effort to read and comment on the several versions of the manuscript and provide me with valuable feedback; and Dr John Ensor for his support.

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I also wish to express my gratitude to the University of Bahrain for its support and sponsorship of my postgraduate studies which greatly contributed to the successful completion of this research.

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ABSTRACT

The advances in communication and computer technology and the availability of the Internet have made it possible that people can do most of their banking transactions from a remote location even without having the need to visit their local branch. With the growing reputation of Bahrain as a financial centre in the Arabian Gulf region, existing banks face intensive competition from new comers which made the banking industry in Bahrain opt for a more aggressive approach in the development of new online banking services.

This thesis reports key findings from an empirical study of the Bahraini banking customer experiences with the adoption of online banking. It provides an understanding of what and how the specific factors influence the decision making process of the bank customers whether or not to bank on the Internet in the Bahraini context. It utilises a theoretical model to examine the intent to adopt online banking service. Using an amalgamated model adapted from two models in the fields of technology research and technology acceptance, this research analysed the relationships between the intention to adopt online banking services and the attitude toward online banking use, subjective norm toward online banking use, selected user perceptions (perceived usefulness, perceived ease of use, perceived risk, perceived behavioural control) and selected user characteristics (age and income).

A questionnaire was employed to collect the data for this research and path analysis was used to analyse the relationships between the proposed model variables. Out of the 13 original model hypotheses, 9 were confirmed. However, the overall model was found to be weak in explaining the relationships regardless of their significance. Furthermore, current non-users were segmented and a binary logistic regression was used to predict the possibility of future adoption among this segment. It was concluded that about 88% of current non-users are predicted to be future online banking users in Bahrain.

In general, the behavioural intention to adopt online banking service in Bahrain was found to be driven primarily by attitudes toward online banking services, and customers' perceived behavioural control. The practical and theoretical implications of these findings are discussed. In summary, this research helps to identify perceptions and factors that explain the intention to adopt online banking service. These factors may be important to the banks and policy makers who wish to encourage the widespread adoption of online banking services in Bahrain.

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CHAPTER 1

INTRODUCTION

This chapter introduces the topic under study in this research, namely, online banking in Bahrain, and the reasons for the choice of this particular topic. It also covers the aim, scope and significance of this research within the Bahrain environment in addition to identifying the research questions investigated. The chapter concludes with an outline of the organisation of this thesis.

1.1 BACKGROUND

With all the technological changes that are taking place around us, our lives are affected in many ways. No matter how people try to ignore these changes, their significance is felt everywhere and is reflected in the way they run their daily lives. In addition, the evolution of technology-based services has altered the way the consumer-service provider relationship to deliver positive service results for both parties. Online banking is one of the areas where the customer is given more control over the service process while banks as service providers aim for reduced workload as one of the benefits as well as customer satisfaction.

However, many bank customers still opt for the comfort of the traditional branch visit or the use of the bank call centres. Although the benefits associated with electronic services have been well documented in earlier research (e.g., Peterson *et al.*, 1997; Daniel, 1999; Furash 1999; Mols, 1999), countries which were leaders in introducing online banking to their customers are still waiting to reap the promised benefits in comparison to their huge investments in technology-based services. For example, many of the U.S. online customers are inactive or use online banking sporadically or use it for

simple transactions such as verification tasks (Sarel and Marmorstein, 2003). In addition, when customers really want to make a transaction which should generate income for the bank they prefer to do it at the traditional bank branch office and complicated transactions are still handled in person (e.g., Flavian *et al.*, 2005).

The financial markets and institutions in the Middle East are no exception to changes demanded by new technological advances and are not immune to the subsequent changing environment. In Bahrain, there is a current trend to move from the traditional brick and mortar branch banking to online banking. As the case with every technological change that takes place, there are benefits, challenges and opportunities for the whole banking industry in addition to the uncertainties and problems which have to be resolved before being fully accepted by consumers.

1.2 MOTIVATION FOR THE RESEARCH

Technology affects the way people live, play and do business. There has been a noticeable shift from the traditional brick and mortar branch banking to more sophisticated banking delivery channels. As these changes also affect the users of the banking system, studying consumers and their behaviours and perceptions towards such technologies subsequently becomes necessary.

The present study attempts to explore the online banking arena as seen by the Bahraini consumers who are still trying to adapt to the many communication developments around them and to understand their attitude formation process and behaviours.

According to Baker (2003), with the development of the new wave technologies such as the Internet, consumers can now express their demands more effectively for particular services as opposed to accepting supplier-designed services. Therefore, it becomes important to the service providers to

understand the roots of these demands to be able to provide these customers with services that match their demands.

1.3 BAHRAIN AS THE FRAMEWORK OF THE STUDY

This study is conducted in Bahrain to evaluate the Bahraini consumer behaviour towards online banking. The cultural environment in Bahrain is characterised by collectiveness where the Islamic religious beliefs take precedence over other traditions and customs. It also dictates particular norms of behaviour and the cohesive family structure still holds enough significance to be reflected in the daily life, decision making, and interpersonal relationships of the Bahraini individual.

As online banking is still in its infancy in Bahrain, the influence of the family on the decision of technology adoption is also under scrutiny here to determine if the cohesiveness of the family in the collective society plays an influential role in such a decision-making process.

1.4 AIM OF THE RESEARCH

The main aim of this research is to investigate the role of attitudes and beliefs in shaping the Bahraini consumer adoption intention towards online banking. The influence of family, peers and colleagues will also be looked into in an attempt to determine their degree of impact on the intention to use the online banking services as well as individual differences reflected by selected demographics.

Using a theoretical model derived from two leading models in the area of technology adoption studies – the Theory of Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB) - this research will analyse the relationships between the intention to adopt online banking and a number of

constructs from both adopted models as well as additional internal and external constructs.

The outcome of this research will help evaluate the relative significance of these constructs in predicting the intention to adopt online banking services in Bahrain. In addition, it will attempt to evaluate the future possibility of adoption among current non-users of online banking in the country using appropriate statistical tools.

1.5 SCOPE OF THE RESEARCH

Banks can use the Internet as a medium for their online banking services in several ways. Some banks opt to be completely virtual and customers use the Internet for all their business transactions with the exception of withdrawal of cash, while others use this technology to complement their brick and mortar banking services. In the latter, customers have the option to either conduct their banking transactions in the traditional way by visiting the bank branch or online. As Bahrain does not have pure virtual banking establishments, online banking as part of the services provided by *traditional* banks will be investigated.

As the target population of the study is the retail banking customers in Bahrain, an exploratory research consisting of extensive reading of the literature on the technology adoption behaviour in general and online banking adoption in particular combined with preliminary informal interviews with employees in the banking sector in Bahrain laid the grounds for this research to take shape. Accordingly, this research follows a quantitative research strategy due to the nature of the topic under study. The research design, sample selection, data collection, analysis and data interpretation reflect this approach together with necessary pilot studies to validate the appropriateness of the data collection tools subsequently adopted.

1.6 SIGNIFICANCE OF THE RESEARCH

Given the scarcity of academic research on this new delivery channel, with respect to the Middle East in general and the Arabian Gulf region in particular, the study is significant for the following reasons:

1. The study will contribute to the literature on online banking in the area of consumer behaviour which will accordingly open avenues for further research to develop a fuller understanding of the subject.

2. With respect to Bahrain, it will be a pioneering study in the field of online banking at the PhD research level.

3. Marketing practitioners in the retail banking sector may find the study results as valuable inputs in the formulation of their marketing communication strategies in Bahrain and the wider Middle East.

To date empirical research on the adoption of online banking services has been very limited within the Middle East region. Most of the studies have taken place in the West where the culture of the consumers differs considerably than those in the Middle East. In addition, no attempt has been made to analyse the adoption of online banking within the context of a theoretical model in Bahrain in particular.

1.7 RESEARCH QUESTIONS OF THE STUDY

The main purpose of this research is to study the adoption of online banking in Bahrain at the individual level and to investigate and model the adoption process. It will be looked at as a process controlled by both individual cognitive and affective elements as well as by the external norms and behavioural constraints on making rational decisions.

This research is designed to answer the following questions:

1. What are the most influential factors that affect the customers' intention to use online banking as a transaction channel?

   The answer to this question will utilise a thorough investigation of attitudes, subjective norms and the perceived behavioural control of the respondents which will help understand the formation of the intention to adopt online banking services.

2. What are the main characteristics of the users of online banking and what are the main obstacles for further adoption of electronic banking?

   To help answer the above question, the influence of demographic factors and attitudes toward online banking in the selection of banking channel will be investigated.

3. Why do some bank customers find online banking unacceptable while others prefer this medium? Which barriers should be eliminated in order to convince the customers of the feasibility of online banking usage?

4. What are the decisive success factors of the Bahraini online banking?

   The above question entails a comprehensive analysis of the framework of consumer behaviour toward technological innovations, and the economic environment, in addition to government policies.

5. Does the collectivist nature of the Bahraini society affect the adoption decision of online banking?

An investigation of the role of the Bahraini culture in influencing the decision making process towards the adoption of online banking in Bahrain will help provide the answer for the above question.

6. Can behavioural intention predict future online banking adoption for the current non-users segment of the sample participants?

The above last research question will attempt to predict the future behavioural intention of the current online banking non-users in Bahrain through the expressed intention of the non-user segment of the respondents.

1.8 STRUCTURE OF THE THESIS

Figure 1.1 summarises the structure of this thesis. It consists of eight chapters. Chapter 1 (the current chapter) introduces the topic of online banking in general in addition to outlining the main purpose of this research, its scope and the significance of carrying out this study. It also highlights the research questions to be broached by this study.

Chapter Two discusses online banking as a technology with emphasis on its benefits for both the service provider and the end user. Literature review is presented with emphasis on studies involving technology adoption in general and online banking in particular. This chapter paves the way for the development of the research model applied and presented in Chapter Four. A discussion of online banking consumer behaviour is presented drawing attention to the differences between it and consumer behaviour in general. The different technology adoption theories are also presented and both the Technology Adoption Model (TAM) and the Theory of Planned Behaviour (TPB) which are the basis for the research model adopted in this study are investigated. Relevant studies applying the different adoption theories from the literature are presented. The chapter concludes with a summary of studies and theories presented.

Chapter Three presents a brief overview of Bahrain as the focus for this study. It highlights the macro-environment for the research topic and discusses the trends in population demographics that are relevant to online banking which may facilitate or hinder the adoption of this banking channel. It also explores the information technology revolution in the Bahraini banking sector and the current online banking situation with particular emphasis on issues that are considered detrimental to the online banking usage in Bahrain.

Chapter Four presents the research model applied in the study together with relevant theories from which it was derived. It restates the research questions and derives the hypotheses to be tested. The research model will be specified and the relationships between the selected variables are hypothesised. The chapter concludes with a summary of how the proposed hypotheses relate to and help answer the research questions.

Chapter Five outlines the research methods used in this study, as well as the tools and instruments employed. It covers both secondary and primary research data collection techniques. The chapter presents the population and sample size of the research along with sources of data used. The chapter also discusses how the questionnaire was developed and the methods of data analysis used. The chapter concludes with a summary of the research process undergone.

Chapter Six tackles the empirical side of the research, analysing the collected data using relevant statistical tools. As this chapter is the first part of the data analysis, the results are explained in terms of analysis of demographic characteristics of respondents which include both users and nonusers of online banking. In addition, ANOVA test results, independent t-test results as well as the findings of the correlation tests are presented and discussed. These tests will help identify the variables that need further investigation in the next chapter.

Chapter Seven continues with the data analysis and presents data modelling where binary logistic regression is carried out to determine the probability of current non-users of online banking services becoming users in the future. It includes the results of the hypotheses testing and the implications of these relationships between selected variables. The chapter concludes with a summary of the feedback received from the respondents of the questionnaire to the open-ended questions asked.

Chapter Eight, presents the concluding remarks about the findings of this study. It also summarises the results in terms of how appropriately they answered the research questions proposed at the beginning of the research and the results of the hypotheses testing. In addition, a comparison of the findings is made with the earlier literature on technology adoption of online services. Contributions of this thesis to knowledge in terms of theory and managerial implications are discussed in addition to some of the limitations of the study. It also presents some potential avenues for future studies in this field.

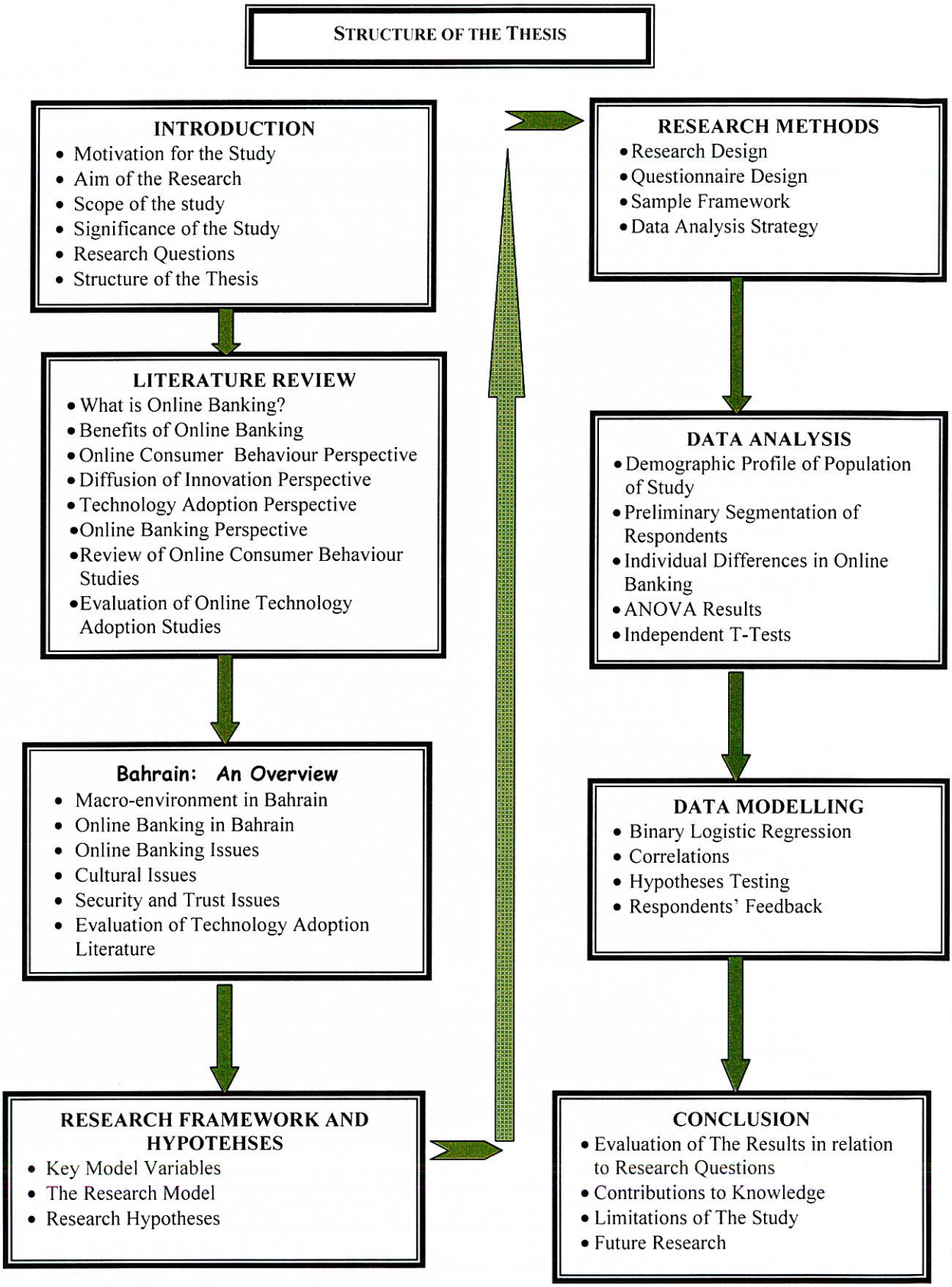


Figure 1.1: **Structure of Thesis**

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter an outline of the online banking technology and its impact on the financial sector will be discussed in detail.

The chapter will start with an explanation of online banking followed by a discussion of the requirements of a sound online banking system. Then the impact of online banking on the financial sector follows in terms of benefits to both the banking sector and the end users. As the research model which will be described in detail in Chapter 4 is theoretically based on the literature of technology adoption, a thorough look at the technology adoption literature follows which is used to explain the online consumer behaviour through the study of attitudes and beliefs. Past research carried out in the field of online banking will also be explored and drawn upon to guide the development of the proposed theoretical research framework and explain the relevant constructs used in the model. The literature analysis will be covered from four different perspectives; online consumer behaviour, diffusion of innovation, technology adoption and online banking adoption. In addition, any discussion of the implementation of a new technology necessitates the analysis of the issues of culture, trust, risk and uncertainty. Finally, an overall evaluation of the technology adoption research in general will be presented.

2.2 WHAT IS ONLINE BANKING?

Online banking is the most general type of electronic banking in our times. It is also called Internet banking.

One of the most significant advances in technology at present is to recruit a combination of the Internet and the World Wide Web to obtain information and do business with a simple click of a mouse. In the financial industry, the Internet has become an effective tool in the rapid changes that are taking place in conducting financial transactions. Daniel (1999) and Jayawardhena and Foley (2000) all agree that online banking is the newest delivery channel in many developed countries and there is a wide agreement that the new channel will have a significant impact on the banking industry.

The initial picture that may come to the mind of many people when mentioning this new banking service is that online banking means 24-hour access to cash through an automated teller machine (ATM) or the ability to deposit cheques directly into checking or saving accounts without the need for the physical presence of the person inside the premises of the bank branch. But, online banking is much bigger than this simple picture and involves more than ATMs as delivery mediums.

The introduction of the Internet and the popularity of personal computers (PCs) present both an opportunity and a challenge for the financial industry. Today most large banking institutions offer some form of online banking usually known as PC banking, home banking, electronic banking or Internet banking.

Daniel (1999) summarised the delivery platforms available for online banking in the following table excluding ATMs as they do not involve usage of the Internet and World Wide Web communication in conducting the transaction.

Table 2.1: **Delivery Platforms for Electronic Banking.**
Source: Daniel 1999, p. 76.

Type of Service	Description
PC banking (private dial up)	Proprietary software, distributed by the bank, is installed by the customer on their PC. Access to bank via a modem linked directly to the bank
Internet Banking	Access their bank via the Internet
Managed Network	The bank makes use of an online services provided by another party
TV Based	The use of satellite or cable to deliver account information to the TV screens of customers (also Internet-based)
Telephone Banking	Customers access their banks via telephone (own personal ID and password required)
Mobile Phone Banking (SMS, WAP, 3rd Generation)	Access with text messages (SMS), Internet connection (WAP), or high speed 3rd generation mobile connection (also Internet based)

Simply put, online banking can mean the provision of information or services by a bank to its customers, via a computer, television, telephone, or mobile phone (Daniel, 1999). It allows customers to access their banks and accounts to carry out various types of banking transactions.

There has been some discussion in the online banking literature about the disappearance of the brick and mortar banks particularly as the future of online banking is becoming more promising and Internet banking is more popular. However, according to Wah (1999), traditional banks will not disappear in the future. Instead the new technology will help the traditional brick and mortar branches to excel in providing their customers with a new generation of banking services. Wah (1999) argues that even traditional banks will benefit from this new technology and they will be able to care for their customers in more efficient and productive ways. This would mean that banks would be forced to be innovative and always on the run to offer a

differentiated, unique service to their customers to guarantee business survival and prosperity.

The main area where the information technology revolution in banking is concentrated is the changes in the distribution channels of the banks. By introducing these changes, the goal is to provide an inexpensive and direct way of distribution channels to gradually ease the routine tasks carried out by bank branches, such as cash withdrawals and deposits.

2.3 THE BENEFITS OF ONLINE BANKING

Online banking offers both the provider (the bank) and the customer with a variety of benefits and advantages.

2.3.1. *Benefits for the Bank*

With Internet banking, it is expected that the number of service branches would be reduced in the future (Vijayan and Shanmugam, 2003). Thus, banks would be able to minimise their overhead expenses. Literature studied online banking from the perspective of the providing bank and it concluded that banks are expected to make substantial savings from introducing these services to their customers as well as enabling them to be in a competitive position (e.g., Peterson *et al.*, 1997; Daniel, 1999; Furash 1999; Mols, 1999). It is claimed that the Internet's single most significant effect/benefit is to cut the cost of interaction: "the searching, coordinating, and monitoring that people and companies must do when they exchange goods, services, or ideas" (Nevens, 1999, p. 145).

Some of the main benefits that the provider can enjoy are:

a) Cost Saving: According to Robinson (2000) the cost of an electronic transaction is dramatically less when it is performed online compared to a

transaction at a branch. Kurtas (2000) stated that the average cost of a direct banking transaction via the web is $0.01. In comparison, an ATM transaction costs $0.27, phone transaction $0.45, a physical branch transaction $1.07, and a cheque transaction $0.95. However, it could be argued that the major savings will be for the banking services provider more than for the customer. Online banking can deliver a lot of benefits to the financial institutions that support it (KPMG, 1998; Mols, 1999; Howcroft and Durkin, 2000). Also, it could be possible that in the long run these savings the bank hopes for do not match up to the initial investment poured into the expensive task of installing the system.

b) Also, Robinson (2000) and Yiu, *et al.* (2007) stated that online banking strengthens the relationship between the bank and the customer because it brings banking services directly to a customer's home or office which in turns creates customer loyalty through relationship management. Customer loyalty is an important and vital goal to be achieved considering the nature of the competition in the market to attract customers (Mols, 2000). Banks must be in a position to offer customers personalised and customised interactions that would totally engage them, capture their attention, and build an online relationship.

Due to the fierce competition in the banking industry, the online banking services are becoming a necessity for banks to enable them to compete with the growing number of services offered by other retail banks (Jourdan and Katz, 1999; Furst *et al.*, 2000). Those retail banks can be either local or foreign drawn in by the possibility of a thriving market as the latter type of retail banks would have the experience of online banking in their home countries (Karjaluoto, 2002). This is particularly true in Bahrain as the case with Bank of Bahrain and Kuwait (BBK), which is gaining a competitive edge over other retail banks on the island, as expressed by BBK officials during the exploratory research interviews. The advantageous position gained by the Bank of Bahrain and Kuwait, according to bank officials and

documented by the increasing number of new customers mostly those transferring their funds to the bank from other local banks, has occurred within a short span of time due to the enhancement of the bank's reputation and better customer service and satisfaction. Subsequently this has placed Bank of Bahrain and Kuwait on a higher level of banking excellence when compared to other retail banks in Bahrain, both local and foreign.

c) Sheshunoff (2000) identified the creation of barriers to customers' move from the bank as an important driving force behind the implementation of full service Internet banking by banks. It is argued that once a customer moves to full-service online banking, the probability of that customer moving to another financial institution is significantly decreased (Pyun *et al.*, 2002). This could be true in Bahrain specifically as switching from one bank to another will require much time and effort on the part of the individual customer. On the other hand, this may not be accurate in some Western countries as banking regulations differ. For example, in England banks participate in facilitating the switching of their customers to other financial institutions because legally they have to. In addition, a great percentage of the Bahrainis are employed by the public sector, namely the government ministries and organisations (Bahrain Central Population Census, 2001). Salaries are paid through the banks and this in itself makes it a complicated process for the employee to change banks. Another point is that Bahrain as other Arabian Gulf countries adopts the systems of "salary-based lending" which dictates that an employee's salary should be deposited at the bank that has granted that employee a loan.

2.3.2 *Benefits for the Customer*

Online banking is expected to increase consumer convenience, since consumers do not have to travel far to perform basic banking transactions like applying for loans, transferring funds, paying bills and customers do not have

to worry about getting caught in queues (Norris *et al.*, 2000). Claessens *et al.* (2000) argued that electronic banking offers great benefits to consumers worldwide. Literature on the adoption of online banking has emphasised the importance of the usefulness of such banking services to the customers and how they view this as a decisive factor in adopting online banking services (e.g., Davis, 1989; Davis *et al.*, 1989; Teo *et al.*, 1999).

Literature emphasises that the benefits online banking creates are not limited only to the service provider but customers can also enjoy a number of benefits by using these services to conduct their banking transactions (Joseph, 1999; Mattila, 2001; Karjaluoto, 2002; Hiltunen *et al.*, 2004). These can be summarised as follows:

a) ***Convenience***: Unlike the brick and mortar banks, online banking web sites are always open as long as there is a connection. They are available 24 hours a day, and they are only a mouse click away.

b) ***Ubiquity***: Whenever and wherever money problems or questions arise, the customer can log on instantly and access his/her online bank and deal with the problem on hand. Therefore, online banking services save time and money while providing convenience and accessibility.

c) ***Transaction Speed and Privacy***: Online bank sites generally execute and confirm transactions at or quicker than human-teller processing speed and customers can enjoy more privacy while interacting with their bank.

d) ***Up-to-date Information***: Customers can be kept updated on all new services offered by the bank in addition to special events, promotions, reports and any relevant information that may be of interest to them or their accounts and investments.

From the consumers' perspective, Internet banking provides a very convenient and effective approach to manage one's finances as it is easily accessible 24 hours a day, and seven days a week. Besides, the information is current and continuously updated. For corporate customers, sophisticated cash management packages offered through Internet banking provide them with up to the minute information, allowing for timely funds management decisions (Kalakota and Whinston, 1996).

However, what banks really aim for is the adoption by the general population and not by a particular segment of it. There is a need to successfully diffuse this innovation across the society. Therefore, some hurdles have to be eliminated first.

A major obstacle that has to be overcome by banks to successfully implement an electronic banking distribution channel is to make consumers aware of this new service.

2.4 ONLINE CONSUMER BEHAVIOUR PERSPECTIVE

The integration of the Internet technology together with the customer-supplier interaction necessitates a detailed investigation of the existing theories that deal with consumer behaviour. Particular attention should be paid on understanding the factors that can help explain the consumers' interaction with the technology, their purchase behaviour in electronic channels and their preference to interact with an electronic supplier on a repeated basis (Saeed *et al.*, 2003).

In addition, according to Boyes and Stone (2003), the attraction of online banking is mainly focused on convenience. However, despite this advantage, consumers seem to perceive risk in adopting online banking. Online banking could be defined as a dynamically continuous innovation whereby there is some disruption from usual methods of behaviour but established behaviour

patterns do not actually change (Schiffman, *et al.*, 2003). On the other hand, Bradley and Stewart (2003) argue that online banking is a discontinuous innovation as it requires dramatically different banking practices. Either way, online banking is definitely an innovation and therefore there will always be some levels of risk in the customers' minds.

2.4.1 *Online Banking Consumer Behaviour*

The adoption process of new technologies has been well studied from a marketing point of view (e.g., Raju, 1980; Shimp and Beardon, 1982; Price and Ridgway, 1983; Childers, 1986; Busch, 1995; Rogers, 1995; Dabholkar, 1996). It was concluded from those studies that demographics represented by education, income, age and gender as well as a number of attitudinal variables are associated with the adoption of new technologies. Nevertheless, the adoption process still remains an open question.

In Bahrain, the traditional branch-based retail banking remains the most widespread method for conducting banking transactions. Several commercial banks in Bahrain have tried to introduce Internet-based electronic banking systems to improve their operations and to reduce costs. Despite all the banks' efforts which concentrate on developing better and easier Internet banking services, these systems remain largely unnoticed by customers and underused in spite of their availability as the case in many other countries (Wang *et al.,* 2003). There is a need to understand users' acceptance of online banking and a need to identify the factors that can affect their intentions to use it. This issue is important because such knowledge will help the banking sector to build sound online banking systems that consumers want to use as well as formulate marketing strategies to promote new forms of online banking systems in the future.

The adoption and use of any technology-enabled services start by the willingness of the consumer to engage in this encounter (Walker and Johnson,

2006). This may be influenced by past experience (Fishbein and Ajzen, 1975; Dickerson and Gentry, 1983; Au and Enderwick, 1999), by the perceived benefits customers expect to gain from these services and the method of service delivery (Au and Enderwick, 1999; Karahanna *et al.*, 1999; Polatoglu and Ekin, 2001) and by the attitudes customers have toward technology in general (Ajzen and Fishbein, 1980; Dobholkar, 1996; Curran *et al.*, 2003; Meuter *et al.*, 2003; Walker and Johnson, 2006).

A number of empirical studies have investigated Internet adoption in the retail financial sector and the driving forces behind the adoption (Hewer and Howcroft, 1999; Ba 2001; Ramaswami *et al.*, 2001; Bradley and Stewart, 2002; Lassar *et al.*, 2005; McKechnie *et al.*, 2006). Empirical research also examined factors impacting on the online information search in the financial sector (Waite and Harrrison, 2002), media perceptions for a specific online banking web site across various task environments (Lassar and Dandapani, 2003), compared attitude and behaviour of various user and non-user segments of online banking (Sarel and Marmorstein, 2003) and other studies identified specific factors influencing the choice of a particular banking channel (Black *et al.*, 2002). Those studies were important in terms of setting up the framework for the research of online banking in Bahrain.

In contrast to traditional banking consumer behaviour, online banking transactions have some unique dimensions such as (a) the extensive use of technology for transactions, (b) the distant and impersonal nature of the online environment and (c) the implicit uncertainty of using an open technological infrastructure for transactions (Pavlou, 2003; Vijayan *et al.*, 2005). More specifically, consumers must first actively engage in extensive technology use through interacting with the bank's website. Second, the spatial and temporal separation among consumers and banks increases fears of performing banking transaction with product and identity uncertainty (Pavlou 2003). Third, there is a concern about the reliability of the underlying Internet delivery channel and related infrastructure that banks

employ to interface with consumers. In general, these distinct differences threaten the consumers' perceptions of control over their online transactions and increase their apprehension about adopting online banking. These perceptions result in greater disparity between intentions and usage (Lee, 1998; Ba and Pavlou, 2002; Pavlou, 2003; Vijayan *et al.,* 2005). In addition, personal consumer information can be easily collected, manipulated and used by multiple parties not linked to a dyadic transaction (Gefen, 2002; Pavlou and Chai, 2002). Moreover, there is always an element of ambiguity about the soundness of the Internet connection system utilised and the degree of security inherited in the system which is used by the service provider (Salisbury *et al.*, 2001; Pavlou and Chai, 2002).

2.4.1.1 Attitude

Fishbein and Ajzen (1975) argue that the attitude people develop toward a certain behaviour is made up of beliefs about engaging in the behaviour and the associated evaluation of the belief. They defined attitude as an individual's positive and negative feelings about performing the target behaviour. In other words, attitude toward behaviour refers to the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question (Ajzen, 1991). Therefore, it could be concluded that attitudes will steer consumers away from products and services that are unlikely to fulfill their needs. In value-expressive situation, the consumer's attitudes allow strongly held personal values to be reflected in his/her behaviour (Karjaluoto, 2002). Accordingly, attitudes can express a self concept and a value system.

In addition, Ajzen (1987) identifies two different kinds of attitudes: attitude towards objects (e.g. 'the online banking system is great') and attitudes towards behaviours (e.g. 'my using the online banking system is great'). Therefore, an individual's attitude toward a system would be considered an

attitude toward an object, while an attitude concerning system usage would be considered an attitude toward a behaviour (Hartwick and Barki 1994).

Consumer's attitude towards online transacting is an influential factor affecting actual transacting behaviour (Shergill and Chen, 2005). Earlier in 1997, Jarvenpaa and Todd proposed a model that explained attitudes and online shopping behavioural intention. Their model was categorised into four major categories: the value of the product, the shopping experience, the quality of the services provided by the website and finally the risk perceptions of Internet retail shopping. In another research conducted by Vellido *et al.*, (2000), they produced several basic factors that affected users' perceptions of online shopping of which risk beliefs of use were the major discriminating factor between users and non-users of online shopping. Other factors included control over the transaction, convenience of process, affordability, customer service and ease of use of the shopping site.

2.4.1.2 Demographics

Agarwal and Prasad (1999, p. 362) defined the term individual differences as user factors that include traits such as personality and demographic variables as well as situational variables that account for differences attributable to circumstances such as experience and training.

Information technology can be found as the base for many technological innovations and individuals with different backgrounds, personalities and past experiences are being introduced to these technologies. To ensure a successful adoption of these technologies, an understanding of those individual differences would help marketers target their strategies at the right segment of the population when promoting their products and services. Rogers (1995) argued that an alternative would be to influence the beliefs directly through strategic actions such as broad-based information dissemination which would make new technologies more readily accepted by

all individuals regardless of their differences assuming that the belief development process has been managed properly. Agarwal and Prasad, (1999, p. 363) argued that user capabilities are usually a result of demographics of the users such as age, educational background, income, or as a personality trait such as risk aversion, self efficacy or situational such as experience with computers and training.

Other previous research on the introduction of technological innovation has also found that individual differences are important external variables and they play a crucial role in the implementation of any technological innovation in a wide variety of disciplines such as information systems, production, and marketing (Majchrzak and Cotton, 1988; Harrison and Rainer, 1992). Therefore, empirical research traced significant relationships between individual differences and information technology acceptance using technology adoption models such as Technology Acceptance Model (TAM) (Igbaria *et al.*, 1995; Jackson *et al.*, 1997; Agarwal and Prasad, 1999; Venkatesh, 2000; Venkatesh and Morris, 2000; Hong *et al.*, 2001). However, the mixed empirical research studies obtained in earlier work suggested that the process through which individual differences influence information technology acceptance is not well understood (Gefen and Straub, 1997; Palvia and Palvia, 1999; Kwon and Chidambaram, 2000).

2.4.1.3 Perceived Risk

Security of online banking transaction refers to the reliability of online banking and an overall belief on the part of the user that banking transactions can be completed confidentially and safely (Mäenpää, 2006). According to Polatoglu and Ekin (2001), security consists of three dimensions – reliability, safety, and privacy. Consumers' concerns about security, which arise from the use of an open public network, have been emphasised as being the most important factor inhibiting the adoption and use of online banking (Daniel, 1999; Sathye, 1999; Cox and Dale, 2001; Howcroft *et al.*, 2002). In addition,

security issues have been identified as significant determinants of online banking quality in several empirical studies (e.g. Jun and Cai, 2001; Liao and Cheung, 2002).

The consumers' perceived risks associated with the security of transactions conducted online have a major effect on their decision making to engage in such a process (Shergill and Chen, 2005). Mayer, *et al.* (1995, p. 726) identified risk perception as the "trustor's belief about likelihoods of gain and losses outside of consideration that involve the relationships with the particular trustee". However, there are still contradictory findings about the role of risk perception in affecting the adoption of online shopping. While Jarvenpaa and Todd (1997) found that it played a minor role in the adoption of online shopping, Culnan (1999) identified the same construct of risk perception as a major obstacle to the future growth of electronic commerce.

The construct of risk aversion is of particular importance to the online banking environment and customers, as banking in general is a very information sensitive industry. It has been formally defined as a combination of uncertainty plus seriousness of outcome involved (Bauer, 1967, p. 196). When considering online banking the utility gains of potential increased efficiency, cost savings and fiscal control become overshadowed with perceived risk and uncertainty of the Internet as an unsecured communications medium (Featherman and Pavlou, 2002, p. 1035).

In addition, the element of risk is closely interwoven with trust (McAllister, 1995; Shergill and Chen, 2005). It is assumed that trust has the ability to minimise the perception of risk associated with opportunistic behaviour by the service provider (Ganesan, 1994). As a new medium channel for banking, online services involve more uncertainty and risk than traditional banking as consumers cannot physically check that the requested banking services have actually taken place or can monitor the safety and security of sending

sensitive personal and financial information through the Internet (Mukherjee and Nath, 2003).

There are valuable empirical researches which have attempted to identify various types of perceived risk in the context of consumers' purchase behaviour. There is a considerable concern about security as a common factor related to unwillingness to use Internet channels for commerce (e.g. Greaves *et al.*, 1999; Jones *et al.*, 2000; Black *et al.*, 2001; Madu and Madu, 2002). However, as our topic of research is online banking, our discussion here will be limited to perceived risk in the context of online transactions. Findings from numerous research papers on the context of online transactions suggest that consumer's confidence or trust will be improved by increasing the transparency of the transaction process, keeping to a minimum the personal data required from the consumer and making clear the legal status of any information provided (Hoffman *et al.* 1999, Jarvenpaa *et al.* 1999, Swaminathan *et al.* 1999). According to Swaminathan *et al.* (1999), they assert that consumers evaluate online vendors before they do online transactions and therefore vendors' characteristics play an important role in facilitating the transaction. This would be applicable in the case of online banking as the reputation of the bank with which the consumer deals plays a significant role in determining online banking adoption by the consumer (Mols, 1999; Aladwani, 2001).

In a study conducted by IDC in 2005, it was found that 80% of the incidents of global usage of fraudulent e-mails and copies of legitimate websites to extract financial data from computer users for criminal purposes in the first quarter of 2005 were targeted toward the financial services sector. Another survey by Chung and Paynter (2002a) identified consumer fears regarding transaction security as an inhibitor to the adoption of online banking. Security has also been named as a major consumer concern in other online banking studies (e.g. Black *et al.*, 2002; Siu and Mou, 2005).

Therefore, for the purpose of this study the perceived risk in the context of online banking transactions will be defined as a possible transaction risk that consumers may encounter when using the Internet as a medium for banking transactions.

2.4.1.4 Culture

In international marketing, culture is considered one of the most influential factors that affect consumers' motives, attitudes toward choices, intentions and purchases on a global basis (Jarvenpaa and Tractinsky, 1999). Samiee (2001, p. 297) supported this argument and asserted that "the single most important factor that influences international marketing on the Internet is culture".

Studies have shown that different cultures react differently to new products and technological innovations (Gatignon *et al.*, 1989; Takada and Jain, 1991; Mahajan and Muller, 1994; Tellefsen and Takada, 1999; Maitland and Bauer, 2001; Kumar and Krishanan, 2002; La Ferle *et al.*, 2002; Tellis *et al.*, 2003; Van Everdingen and Waarts, 2003, Yeniyurt and Townsend, 2003; Dwyer *et al.*, 2005). Therefore, it is expected that a new product or technological innovation will be readily accepted in some countries while in others it may take substantially longer time.

Culture is defined as: "the collective programming of the mind which distinguishes the members of one human group from another (Hofstede, 1991, p.5)." In his book titled *Culture's Consequences,* Hofstede (1980) suggested four dimensions of culture. These four dimensions are based upon a study of 72,215 employees working in 66 national subsidiaries of IBM Corporation between 1967 and 1973. The dimensions are power distance, individualism-collectivism, uncertainty avoidance, and masculinity-femininity. Baligh (1994) looked at culture in terms of its parts and components. Functional segments, such as the economic system, the family, education, religion,

government and social control, language and communication and transformation of technology are commonly listed parts within a culture (Hall and Hall, 1987; Ferraro, 1990; Hall and Hall, 1990; Chanlat and Bedrad, 1991; Culpan, 1991). The individual consumer would look at these social economic and institutional structures that are related to the macro-environmental influences to determine the overall context in which he/she makes a purchasing decision with beliefs, values, logic and decision rules as basic components of a culture (Gong *et al.*, 2007). In other words, a consumer will observe what is expected from her/her within the environment in which he/she lives and will act accordingly. A social group acquires its values, meanings, ideas and beliefs through various cultural aspects such as products, information and communication technologies (Hasan and Ditsa, 1999).

Researchers in business, psychology and sociology have extensively used Hofstede's framework. Several studies have confirmed Hofstede's framework (e.g. Shackleton and Abbas, 1990; Hoppe, 1992; Barkema and Vermeulen, 1997). However, there are others who contend that Hofstede's conclusions may not be valid in the long term (Triandis, 1982; Levitt, 1983; Nordstrom, 1991; Igbaria, *et al.*, 1995; Kamel and Davison, 1998; Myers and Tan, 2002). Major concerns stem from the view that cultural and societal values are converging over time and thus, Hofstede's cultural dimensions are no longer valid in adequately explaining cultural differences. Some argue that the Internet and accompanying advances in communication technologies have accelerated the homogenising effect and hastened the cultural convergence (CPSR, 1997; Lee, 1998; Deen, 1999).

In spite of these criticisms, Hofstede's framework remains useful in theory development and validation in cross-cultural studies. Also, its impact in the fields of international business, marketing and management is well documented (Chandy and Williams, 1994; Sondergaard, 1994; Sivakumar and Nakata, 2001). In light of this evidence in support of Hofstede's framework,

it is useful to employ the proposed cultural dimensions in studying the relationship between a national culture of a country and the Internet diffusion rate (Nath and Murthy, 2004).

(i) Individualism versus Collectivism: This dimension relates to the way people live together. Hofstede (1991, p.51) described individualism as it "pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family". On the other hand, he also identified collectivism as that which "pertains to societies in which people from birth onwards are integrated into strong, cohesive groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty". Obligations and group harmony come before individual aspirations or goals in collectivist cultures (De Mooij, 1998). Cultures with high individualism value personal time and achievement (Marcus and Gould, 2000). Subsequently, such societies are expected to be more innovative and open to new ideas (La Ferle *et al.*, 2002; Yeniyurt and Townsend, 2003).

Walker and Johnson (2006) anticipated that use of technology-enabled services would be influenced by the extent to which personal contact is perceived needed or preferred. There is a group of people who find technology-enabled services preferable because it eliminates the need for personal contact and interaction with services personnel and other customers (Davis *et al.*, 1992; Sathye, 1999; Poltoglu and Ekin, 2001; Dabholkar and Bagozzi, 2002; Curran *et al.*, 2003). On the other hand, there is another group of people who prefer to deal or interact with people rather than machines, which are often thought to be impersonal and unable to provide personalised services (Cowles and Crosby, 1990; Prendergast and Marr, 1994; Dabholkar, 1996; Dabholkar and Bagozzi, 2002; Walker *et al.*, 2002). For the latter group of people, it can be concluded that service encounters provide them with an opportunity for social interaction. This seems to be in agreement with

the characteristics of people descending from collective societies where interaction with others is important.

(ii) Power distance: Hofstede also emphasised the concept of power distance which is the degree of inequality in power between a less powerful individual and a more powerful other, in which both belong to the same loosely or tightly knit social system (Hofstede, 2001, p. 83). In high power distance cultures such as Asia, and the Middle East, they are characterised by wide inequalities in power systems, centralised and hierarchical structures and dependence on higher ranked people for guidance (Burgmann, *et al.*, 2006). In an online banking context, this can be seen as due to feelings of inequality in power, people may use technology to establish a feeling of supremacy among others.

(iii) Status: This reflects the perceived social significance of practising online banking as a means to express and enhance one's self-concept. This argument can be traced back as far as Grubb and Grathwohl's (1967) review on self-theory and symbolism. As a dimension of social desirability, status measures the impact of online banking use on self-image (Gerrard and Cunningham, 2003). This dimension applies to impression management, i.e. by consuming certain products or services consumers strive to influence their image in the eyes of other consumers (Holbrook, 1999). The intention here is to probe whether consumers perceive the use of online banking affecting positively on their social status and self-concept. Consumers often use products and services for impression management (products as responses), and products may also be used for self-definition (products as stimuli) (Solomon, 1983).

In achievement cultures status is derived from one's own achievement (Burgmann *et al.*, 2006). However, in ascription orientated cultures, status is derived from one's job title, age, sex, and kinship, which is similar to

Hofstede's power distance dimension (Hampden-Turner and Trompenaars, 1993; Trompenaars and Hampden-Turner, 1997).

2.4.1.5 Self Efficacy

Self efficacy theory has been applied to a very diverse range of human behaviours (e.g., Lee, 1982; Levinson, 1982; Rollnick and Heather, 1982; Barling and Beattie, 1983), demonstrating that a sense of self-efficacy can make a difference to how people think, feel and act (Schwarzer and Fuchs, 1995).

Self efficacy refers to the extent to which prospective users of technology believe they are capable or equipped to engage with and use technology-enabled services successfully (Davis *et al.*, 1989; Adam *et al.*, 1992; Dabholkar, 1996; Mick and Fournier, 1998; Kolesar and Galbraith, 2000; Dobholkar and Bagozzi, 2002; Karjaluoto *et al.*, 2002b; Walker *et al.*, 2002). Willingness to use and preparedness to engage with technology-enabled services imply not only the ability (Hill *et al.*, 1987; Zineldin, 2000; Karjaluoto *et al.*, 2002b) but also a sense of self confidence to do so (Hill *et al.* 1987; Hoffman and Novak, 1996; Karjaluoto *et al.*, 2002b). In relation to online banking usage, self efficacy can act as a strong motivator to use such services.

A number of studies have examined the relationship between the construct of self efficacy with regard to computer use (Hill *et al.*, 1986; Hill *et al.*, 1987; Gist *et al.*, 1989; Burkhardt and Brass, 1990; Webster and Martocchio, 1992; 1993; Chan and Lu, 2004). It was concluded that a relationship does exist between self efficacy and the adoption of high technology products (Hill *et al.*, 1986), registration in computer courses at universities (Hill *et al.*, 1987), technology innovation adoption (Burkhardt and Brass, 1990), performance in software training (Gist *et al.*, 1989; Webster and Martocchio, 1992; 1993) and Internet banking services adoption indirectly through perceived usefulness

(Chan and Lu, 2004). Lohse *et al.*, (2000) attempted to explore the predictors of online transacting behaviour. They concluded that the typical online consumers are characterised by their wired lifestyle and that they are time starved. The empirical studies conducted focused on several aspects of factors that were considered to affect online consumer behaviour and the consumer's self confidence to conduct such a transaction.

2.5 DIFFUSION OF INNOVATION PERSPECTIVE

The diffusion of innovation literature contributed greatly to introduce a better understanding of the diffusion of new products and services. Rogers (1995, p. 5) defines diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system". It is also considered to pass sequentially through knowledge, persuasion, decision, implementation and confirmation of the innovation (Chaudhuri, 1994). Rogers reviewed the existing studies on diffusion of innovations from educational, medical and marketing domains and found considerable similarities among these different disciplines. Accordingly, Rogers suggested in his book *Diffusion of Innovations* in 1962 that there are specific elements that act as determinants of the diffusion of an innovation. These characteristics are: relative advantage, compatability, simplicity or complexity, traiability or divisibility and observability or communicability (Rogers, 1995, p. 207). The field of marketing emphasises the importance of these elements which serve to act as predictors of future rates of adoption of an innovation. The success of innovations depends on the extent to which these traits are present as well as other conditions such as the compatibility of the innovation to the existing values and beliefs held in the social system, the nature of the social system, the effectiveness of communication channels and the efforts of the change agents (Chaudhuri, 1994).

Researchers found later that there was a need to add the element of perceived risk to those perceptual beliefs which were first suggested by Bauer, (1960)

(e.g. Ostlund, 1974; Holak, 1988; Holak and Lehmann, 1990). The diffusion of innovation literature helps draw attention to two important elements of how people adopt new innovations; (1) the perception of the innovation and its influence on the innovation adoption decision process; and (2) the particular characteristics of the consumers who are potential adopters of these innovations (Conner, 2002). The following diagram summarises the Diffusion of Innovation Model as presented by Rogers (1995).

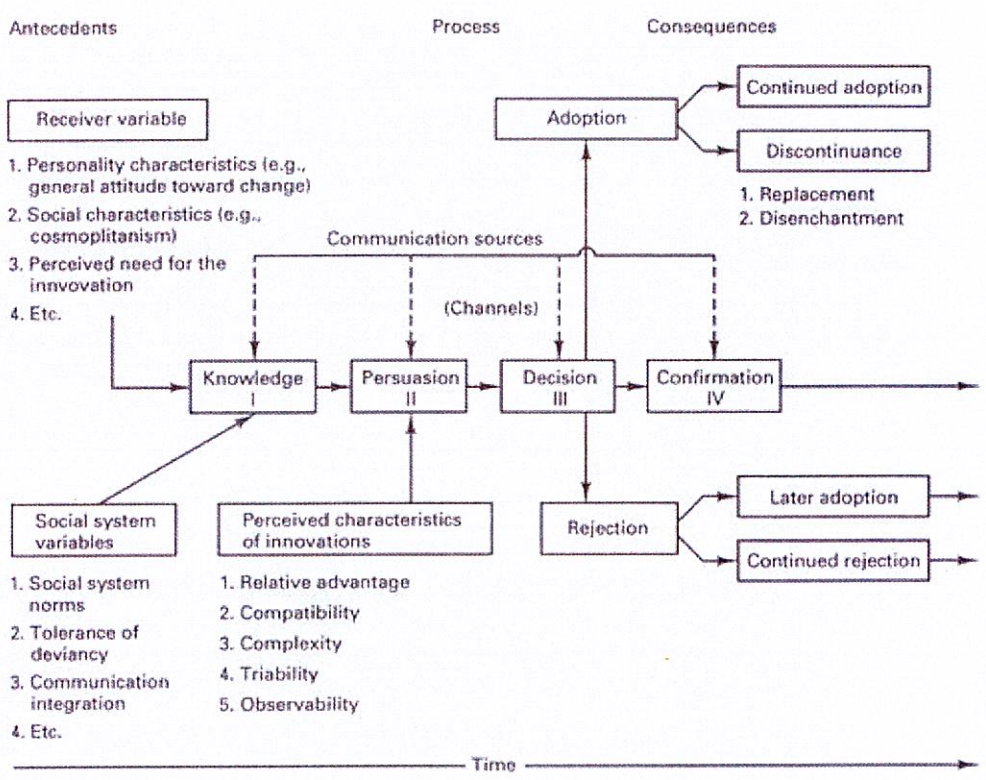


Figure 2.1: **Diffusion of Innovation Model**
Source: Rogers (1995)

In addition, Rogers (2003, p. 22) identified consumer adopter categories as "the classifications of members of a social system on the basis of innovativeness". This classification includes innovators, early adopters, early majority, late majority, and laggards. In each adopter category, individuals are similar in terms of their innovativeness which is "the degree to which an individual or other unit of adoption is relatively earlier in adopting new ideas than other members of a system" (Rogers, 2003, p. 22). Braak (2001, p. 144) described innovativeness as "a relatively-stable, socially-constructed,

innovation-dependent characteristic that indicates an individual's willingness to change his or her familiar practices". Figure 2.2 shows the distribution of adopters according to Rogers.

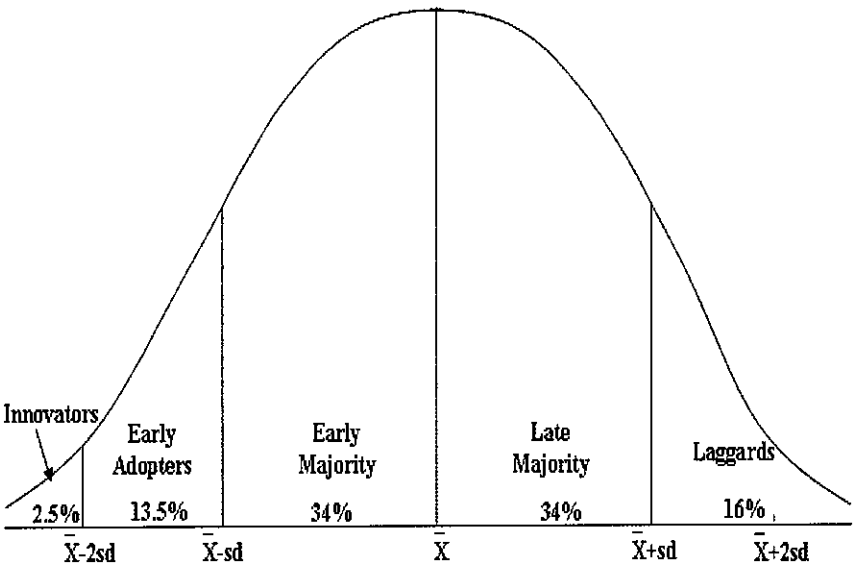


Figure 2.2: **Adopter Categorisation on the Basis of Innovativeness**
(Source: Rogers, 1995)

Everett Rogers, the father of Innovation Diffusion Model, periodically summarises the literature (1962; 1971; 1983; 1995). In the 1983 edition, he acknowledged criticisms of the theory, noting that the absence of critical viewpoints in the early development of the theory may have been a weakness in the long run (Stephenson, 2003). One of the main criticisms of the Diffusion of Innovation Model is that it is not predictive because it does not provide insight in how well a new idea or product will perform before it has gone through its adoption curve. Another criticism put forward by critics of this model is that it is an overly simplified representation of a complex reality. Adopters often fall within different categories for different innovations: a current laggard can be an early adopter the next time around (Rogers, 2003).

With respect to the current situation of online banking in Bahrain, this innovation is still in its early adoption stage. Bahraini bank customers would be mostly classified to fall in the early adopter stage, according to Rogers' classification. People have yet to acknowledge the innovation traits before a

move to the second stage of early majority category can take place. It is the role of the banks together with the government to enhance the perception of this technology to the public by providing quality banking services with sound security measures.

2.6 TECHNOLOGY ADOPTION PERSPECTIVE

Previous studies from related management disciplines such as organisational behaviour, marketing and information systems have investigated the different relationships among factors such as usage and behavioural intention (e.g. Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980; Ginzberg, 1981; Bagozzi, 1982; Swanson, 1982; Chaiken and Stangor, 1987; Jackson *et al.*, 1997; Pedersen, 2005). All models studied here and from which the research framework is developed are all based on the behavioural intention, which has emerged as a common anchor for examining individual technology acceptance and adoption (Sheppard *et al.*, 1988; Venkatesh and Morris, 2000; Chau and Hu., 2001).

According to Pedersen (2005), the individual level of adoption of technology has been studied applying various cognitive and social theories of decision making, but three models stand out as the most widely applied: The Technology Acceptance Model (TAM) which was originally proposed by Davis (1989), the Theory of Reasoned Action (TRA) which was originally proposed by Fishbein and Ajzen (1975) and the extension of TRA into the Theory of Planned Behaviour (TPB) proposed by Ajzen (1985). The TPB has been successfully applied to the understanding of individual acceptance and usage of many different technologies (Mathieson, 1991; Taylor and Todd, 1995b; Harrison *et al.*, 1997). A decomposed model of the Theory of Planned Behaviour was later introduced to predict intentions. The decomposed model of the Theory of Planned Behaviour decomposes attitude, subjective norms, and perceived behavioural control into their underlying belief structure within technology adoption contexts (Venkatesh *et al.*, 2003). The following section

will briefly describe the Theory of Reasoned Action from which the Theory of Planned Behaviour is derived and which is one of the two models used for the amalgamated model used in this research.

2.6.1 *Theory of Reasoned Action*

The development of the Theory of Reasoned Action (TRA) originated in the field of social psychology. Theories that attempt to explain attitudes and their influence on behaviour started to take shape since late 1800s. Early theories suggested that "attitudes could explain human actions" (Ajzen and Fishbein, 1980, p. 13). The Theory of Reasoned Action was, "born largely out of frustration with traditional attitude-behaviour research, much of which found weak correlations between attitude measures and performance of volitional behaviours" (Hale, *et al.*, 2003, p. 259).

The Theory of Reasoned Action (Figure 2.3) is a well-developed and tested behavioural prediction model that has been used successfully since the mid 1970s to predict consumer behaviour across a wide variety of domains (Davis *et al.*, 1989). The TRA, developed in 1967, was revised and expanded during the early 1970s by Ajzen and Fishbein (1980) who proposed that a person's behaviour is determined by his/her intention to perform the behaviour and that this intention is, in turn, a function of his/her attitude toward the behaviour and his/her subjective norms (Ajzen and Fishbein, 1980, p. 62).

According to TRA, behavioural intention is a function of both attitudes toward a certain behaviour and the subjective norms toward that behaviour, which has been found to predict the actual behaviour (Miller, 2005). Behavioural intention is conceptually defined as a person's intention to perform a behaviour, with the latter being described as the transmission of intention into action (King and Gribbins, 2002) (Appendix 1). An individual's intention to adopt an innovation is influenced by a personal factor and a social influence factor. The personal factor, attitude toward performing

the behaviour, is an individual's positive or negative belief about performing a specific behaviour (Fishbein *et al.*, 1980, p. 246). The social influence factor, subjective norm (SN), is evaluated as a combination of perceived expectations from relevant individuals or groups along with intentions to comply with these expectations, i.e., the person's perception that most people who are important to him or her think he/she should or should not perform the behaviour in question (Azjen and Fishbein, 1975).

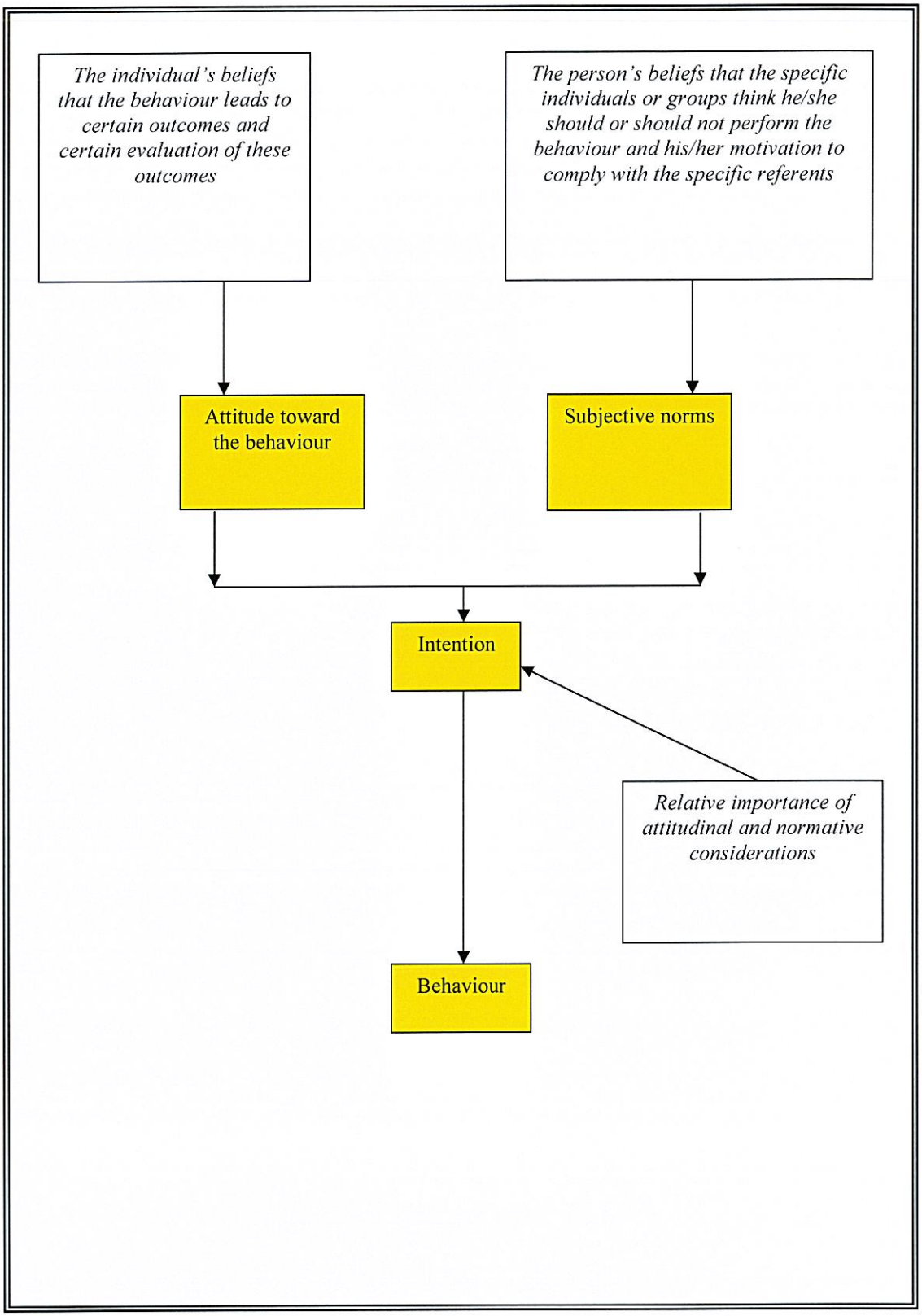


Figure 2.3: **The Theory of Reasoned Action (TRA)**

Source: Ajzen and Fishbein (1980) Understanding Attitudes and Predicting Social Behaviour, p. 185

The greatest limitation of the theory stems from the assumption that behaviour is under volitional control. Hall, *et al.* (2003) argue that the theory mainly applies to behaviour that is consciously thought out before hand and excludes any impulsive decisions, irrational actions or any spontaneous behaviour that are not consciously considered. For example, Ajzen, *et al.* (1982) found that people who are capable of varying their behaviour depending on what situation they are in (high self monitors who do not always act on their intention) are not explained by the TRA.

By the time the Theory of Reasoned Action began to take hold in social science, Ajzen and other researchers realised that this theory was not sufficient and had several limitations (Godin and Kok, 1996).

To overcome these problems, Ajzen proposed the Theory of Planned Behaviour (TPB) (Ajzen, 1985). The new theory addresses the issue of behaviours that occur without a person's volitional control. This of course raises a fundamental theoretical problem in the 'new' TPB and that is quite simply how can behaviour be 'planned' by an individual who has no control over his/her 'behaviour'? This is an issue which will be addressed in the data analysis chapter (Chapter 7).

The Theory of Planned Behaviour is similar to the Theory of Reasoned Action except for the addition of the Perceived Behavioural Control (PBC) component. This addition was made to explain the times when people have the intention of carrying out a behaviour, but the actual behaviour is thwarted because they lack confidence or control over their behaviour" (Miller, 2005, p. 127). The Perceived Behavioural Control component consists of control beliefs and perceived power. These factors state that motivation, or intention, is influenced by the perceived degree of difficulty of the task on hand and whether the person expects to successfully complete the behaviour. This is akin to the economists' view that people are always rational.

2.6.2 *Theory of Planned Behaviour*

This theory was proposed as an extension to the Theory of Reasoned Action to account for conditions where individuals do not have complete control over their behaviour (Ajzen 1985, 1991; Mathieson, 1991). The Theory of Planned Behaviour (TPB) (Figure 2.4) asserts that behaviour is a direct function of behavioural intention. It also assumes that behavioural intention is a function of attitude and subjective norms, and perceived behavioural control which is added to the original model to account for situations where individuals lack complete control over their behaviour (Ajzen, 1985, 1991; Ajzen and Madden, 1986).

The TPB operates on the premise that the best way to predict behaviour is to measure behavioural intention, which in turn is seen to be a function of three independent variables, i.e. attitude, subjective norms and perceived behavioural control (Ajzen, 1985, 1988). Briefly, attitude, i.e. an individual's positive or negative evaluation of behaviour, is seen to reflect beliefs about the likely consequences of performing a behaviour, whilst subjective norm is an individual's perception of social pressure and thus reflects the beliefs about the normative expectations of others (Ajzen and Fishbein, 1980; Ajzen, 2002). Perceived behavioural control, a more recent addition to the model (Ajzen, 1985), is intended to accommodate for situations in which people may lack complete volitional control and as such is seen as a reflection of the perceived ease or difficulty involved in performing a behaviour. Whilst the theory has generated much support in a wide variety of settings (e.g. Armitage and Conner, 2001b), some concerns have been expressed regarding the conceptualisation of the control variable. Specifically, it has been suggested that a distinction should be made between the concepts of self-efficacy and perceived control since it cannot be assumed that an individual's perception of the extent to which a behaviour may be impaired by external factors will necessarily correspond with their judgements as to how easy that behaviour would be to perform (Terry and O'Leary, 1995). A person may perceive

there to be few environmental constraints operating, i.e. they may consider the behaviour to be under their control, but at the same time they may perceive that behaviour as difficult to carry out (Pomazal and Jaccard, 1976; Giles and Cairns, 1995; Manstead and Van Eekelen, 1998; Armitage and Conner, 1999a, Armitage and Conner, 1999b, 2001b; Armitage *et al.*, 1999). Whilst there is no clear evidence as to which is the preferred measure of control within the TPB (Armitage and Conner, 2001b; Ajzen, 2002), evidence is accumulating to suggest that with the behavioural control variable playing the role of self efficacy is not only an important addition to the theory, but it frequently emerges as the most significant predictor of both intention and behaviour (Armitage and Conner, 2001a).

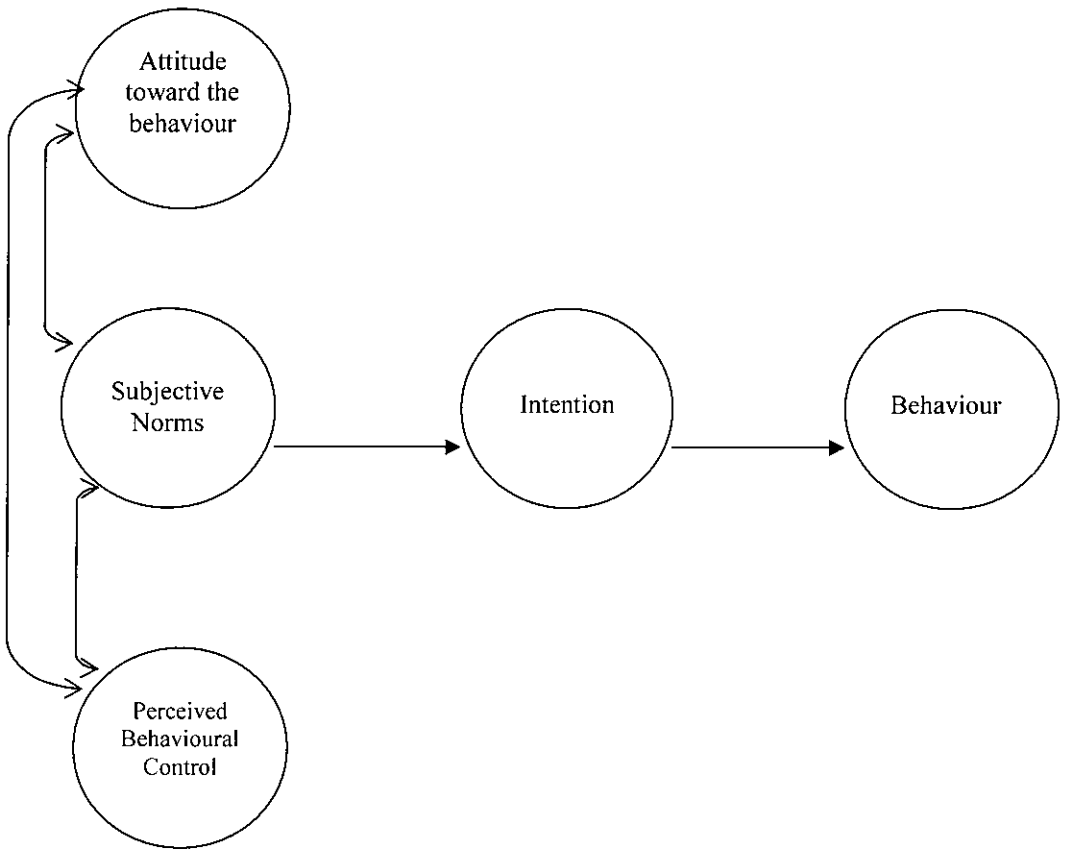


Figure 2.4: **The Theory of Planned Behaviour**
Source: Ajzen (1991), p. 182

According to Madden *et al.* (1992), for both dependent variables, behavioural intentions and target behaviour, the Theory of Planned Behaviour explained significantly more variation than the Theory of Reasoned Action. These results indicate that increased accuracy in the prediction of intentions and target behaviour could be achieved by assessing perceived behavioural control over the behaviour.

The Theory of Planned Behaviour was later decomposed by Taylor and Todd (1995b) into multi-dimensional constructs which provides several advantages over uni-dimensional belief structures. In earlier research, Bagozzi (1983) examined the appropriateness of multi-dimensional belief structures related to attitude formation and found that when constructs were combined into a uni-dimensional construct, invalid results were obtained.

2.6.3 *Technology Acceptance Model*

One of the most utilised models in studying information systems acceptance is the Technology Acceptance Model (TAM) (Davis *et al.*, 1989; Mathieson, 1991; Davis and Venkatesh, 1996; Gefen and Straub, 2000; Al-Gahtani, 2001) in which system use (actual behaviour) is determined by perceived usefulness (PU) and perceived ease of use (PEU) relating to the attitude toward use that relates to intention and finally to behaviour (Pikkarainen *et al.*, 2004).

The Technology Acceptance Model (Davis, 1989; Davis *et al.*, 1989) focuses on the attitudinal explanations of intention to use a specific technology or service (Figure 2.5). It includes five concepts: perceived user friendliness or ease of use (PEU), perceived usefulness (PU), where both are affected by external variables, attitudes towards use, behavioural intention to use and the actual system use.

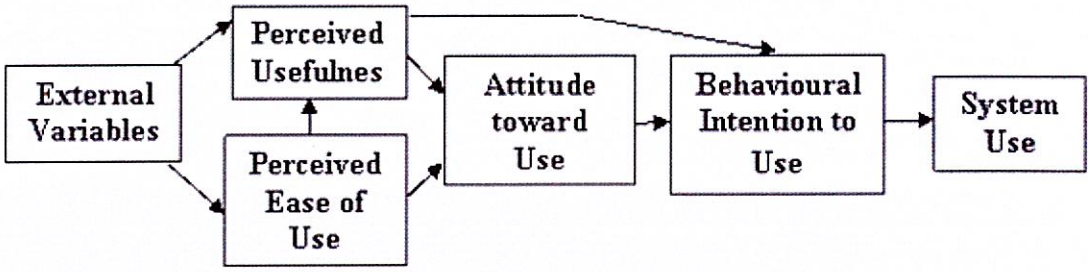


Figure 2.5: **Technology Acceptance Model**
Source: Davis, Bagozzi and Warshaw, 1989, p. 985

As depicted in the above diagram, the degree to which online banking technology is easy to use, as perceived by a bank customer, affects his/her perception of how useful the technology would be as well as his/her attitude towards using the technology. Attitude is also directly influenced by the bank customer's perceived usefulness of the technology.

Davis *et al.* (1989) described the variables of the model as universal to different types of computer systems and user populations. In addition, Lederer *et al.* (2000) and Lin and Lu (2000) argue that this model can be applied to explain individuals' attitudes to web-sites. Although the original model was designed to predict user acceptance of computer technology within the workplace, studies found it to be suitable as a theoretical basis for understanding the use, behaviour and acceptance of many new Internet-based technologies (Gefen *et al.*, 2003; Monsuwe *et al.*, 2004; McKechnie *et al.*, 2006).

Perceived usefulness of online banking can be identified with the perceived degree of convenience of this service as it allows ubiquitous access and time savings for the consumer. A number of studies have found that convenience is an important adoption factor (Ramsay and Smith, 1999; Thornton and White, 2001; ACNielsen, 2005; Pew, 2005). In the U.S., a study by Pew (2005) concluded that the main motivator for online banking is convenience in terms of 24/7 access and time saving. Chung and Paynter (2002a) found

that many people who did not utilise online banking believed they did not need high levels of convenience.

2.7 ONLINE BANKING PERSPECTIVE

Online banking as a financial delivery medium is becoming increasingly important in the banking field and has gained substantial attention in academic literature in recent years (Daniels, 1999; Mols *et al.*, 1999; Sathye, 1999; Jayawardhena and Foley, 2000; Sheshunoff, 2000; Howcroft *et al.*, 2002; Karjaluoto *et al.*, 2002(a); 2002(b); Gerrard and Cunnigham, 2003; Akinci *et al.*, 2004; Pikkarainen *et al.*, 2006). Table 2.2 summarises some of online banking studies from all over the world with the findings of each study.

Table 2.2: **Summary of Online Banking Studies**

No	Author(s)	Year	Article Type/Sample Details	Summary and Findings
1	Akinci, S. Aksoy, S. Atilgan, E. (Turkey)	2004	Empirical (Email Survey) 1228 Academicians	Analysed attitudes, behaviour and preferences of highly educated consumers. Significant differences between users and non-users with respect to demographic profile, attitudinal properties and preferences for service delivery channels were found. Users: mid-age, male, more technology oriented, convenience minded consumers; non-users: young below 30 years of age, more traditional channel oriented, hesitant consumers, lacking confidence in Internet banking services compared to the services delivered at bank branch. Importance of highly educated consumers groups to banks; some Internet banking services underused (e.g. bonds, mutual funds); segmentation of Internet banking consumers.
2	Aladwani, A.M. (Kuwait)	2001	Empirical (Administer-ed Survey) 80 I.T. Managers and Students	Faster, easier and more reliable services to customers, improvement of the competitive position were the most important drivers of online banking among the bank and IT managers. Security, regulations, consumer privacy and bank's reputation were the main future challenges in the adoption of Internet banking in Kuwait.
3	Awamleh, R. and Fernandes, C. (UAE)	2005	Empirical	Adopted Diniz model to evaluate website of foreign and local banks in United Arab Emirates (UAE) and evaluated factors that are significant in determining the satisfaction of customers using the Internet banking services. Found out that although banking sector in UAE is a regional leader, Internet banking in UAE is yet to be properly utilised as a real added value tool to improve customer relationship and to attain cost advantages. Convenience and security of Internet banking had a significant impact on satisfaction. Security of Internet banking was significant for users of more than 2 years while not for others.

4	Bradely, L. and Stewart, K. (Ireland/USA)	2002	Empirical (Interviews/ Delphi Question-naire) 71 Senior Personnel And Academics	Investigated the factors driving and inhibiting Internet banking with the main component of the research as a Delphi study of expert opinion. It concluded that external factors seemed to be the key factors while factors internal to the retail bank inhibited further diffusion of Internet banking. Key inhibitors were mainly internal issues such as lack of enhanced ability to deal with customers, resistance to change, attitudes within the bank to this innovation, resources available and the existing legacy system. Risk, consumer demand, competitive forces, and the technological issues were crucial drivers. Retail banks perceived competitive advantage achievable through improved customer dealing, an advantage that Internet banking must clearly demonstrate.
5	Barczak, G., Ellen, S.P. and Pilling, B.K. (USA)	1997	Empirical (Mail Survey) 331 Bank Customers	Researchers studied consumer motives for use of technologically based banking services and distribution channels and found that customers could be clustered on their money management philosophies. They described four motivational clusters including: security conscious, maximizers, instant gratification and hassle avoiders. Each segment had different attitudes and behaviours toward different banking technologies.
6	Bauer, H., Hammer-schmidt, M and Falk, T.	2005	Empirical	Validated a measurement model for the construct of web portal quality based on the following dimensions: security and trust, basic services quality, cross-buying services quality, added value, transaction support and responsiveness. The identified dimensions could reasonably be classified into three service categories: core services, additional services, and problem-solving services. They concluded that knowledge of these dimensions as major determinants of consumer's quality perception of the Internet provided banks a promising starting point for establishing an effective quality management for their e-businesses.
7	Black, Lockett, Ennew, Winklhofer, and McKechnie (UK)	2002	Empirical	Consumers' channel choice in financial services was determined by consumer, product, channel, and organisational characteristics in which product-channel interactions and consumer channel interactions were of particular importance.

8	Black, N.J., Lockett, A.D., Winklhofer, H. and Ennew, C.T. (UK)	2001	Empirical	This study reinforced the importance of the perceived innovation attributes in the adoption process and drew attention to additional dimensions such as societal issues.
9	Bloemer, J., De Ruyter, K. and Peeters, P. (Holland)	1998	Empirical	Quality in bank services had an indirect effect on loyalty through customer satisfaction which in turn had a direct positive effect on loyalty. Satisfaction with bank services was influenced by several factors such as consumer typology and the type of the delivery channel.
10	Lang, B. and Colgate, M. (New Zealand)	2003	Empirical	Investigated compatibility between consumers' and providers' technology levels by way of their medium of interaction, and how this might influence their relationship. Tracking customer preferences with regard to how they liked to interact with a firm and applying appropriate interaction strategies was one way of dealing with such issues. They recommended that customers should be allowed to interact with their service providers in a way that they would like to interact with them and making this as easy as possible which would strengthen the providers' ability to build strong relationships with their customers.
11	Branca, A.S. (Turkey)	2008	Empirical 24,000 bank customers	Empirical evidence suggested that demographic variables' influence over consumers' usage frequency decision had both a direct and indirect effects. These influences were identified by the delivery channel. Bank managers would benefit from knowing, by channel, which demographic characteristics had the desired direct and indirect impact on usage frequency. This knowledge would improve bank managers' efforts to encourage customers to favour a specific delivery channel.
12	Brick, G, Brown, A.B. and Abratt, R (South Africa)	2004	Empirical	Examined the perception and expectations of banking customers regarding the value being delivered by their banks. Participants preferred electronic banking as opposed to banking in the branch. However, customers were not satisfied with the service, products and level of customer intimacy delivered to them by their banks and they were not getting the value they expected. Customers rated problem-free, convenient and efficient banking as the most important aspect of value.

13	Brown, I.T.J., Hoppe, R.S., Mugera, P.K.L., Newman, P. and Stander, A. (South Africa vs Singapore)	2004	Empirical	The study replicated a recent Internet banking in Singapore. It compared results between Singapore and South Africa and explained differences in the adoption process in terms of national environment. Results confirmed that attitudinal and perceived behavioural control factors influence adoption in South Africa as in Singapore but not the social factors. However, there were differences in the number of determinants and the degree of influence of certain determinants. These differences were explained in terms of three environmental dimensions: socio-economic conditions, the state of the Internet diffusion and government information communication technology policies.
14	Byers, R. and Lederer, P.J. (USA)	2001	Theoretical	The study concluded that changing consumer attitudes rather than banks' cost structure determined the changes in distribution strategy. Virtual banks will be profitable when the virtual preferring is approximately twice the size of the branch preferring segment.
15	Chang, T.Y. (Korea)	2004	Empirical	Examined behaviour of banks and customers when introducing online banking. Found that adoption behaviour was affected by individual characteristics in both static and dynamic frameworks such as demographics, exposure to hazard, information seeking behaviour and general banking behaviour. Koreans acted collectively rather than individually which explained why there was rapid diffusion of Internet banking across banks and individuals. The security issue was one of the main concerns for both adopters and non-adopters.
16	Chou, D. and Chou, A.Y.	2000	Theoretical	The research listed five basic services of online banking: viewing account balances and transaction histories, paying bills, transferring funds between accounts, requesting credit card advances and ordering cheques.
17	Curran, J.M. and Meuter, M.L. (USA)	2005	Empirical	Compared adoption process for three banking technologies, ATMs, phone banking and online banking. Different factors influenced attitudes toward each of these technologies and there was a need to consider multiple factors when introducing technologies into the service encounter and that the salient factors may vary among technologies and their stages in the adoption process. They recommended that marketing strategies which address salient beliefs must change during the diffusion process to address the beliefs that were most important at each stage.

18	Daniel, E. (UK, Ireland)	1999	Empirical (Mail Survey) Managers	They identified three important factors considered by bank managers in determining provision of electronic banking services: vision of the future, prediction of customer acceptance and organisational culture of innovation. Integration with existing channels, pricing of electronic services and competition were the main obstacles and challenges of Internet banking adoption.
19	Gan, C., Clemes, M., Limsombunchai, V., and Weng, A. (New Zealand)	2006	Empirical/ Mail Survey 1960 Households	Examined consumers' choices between electronic banking and non-electronic banking in New Zealand. Service quality, perceived risk factors, user input factors, employment, and education were the dominant variables that influenced consumers' choice of electronic banking and non-electronic banking channels. The study also provided an improved understanding of consumers' choice between electronic and non-electronic banking. It provided insights into the links between electronic banking and consumer decision making.
20	Gerrard, P. and Cunningham, J.B. (Singapore)	2003	Empirical (Focus Group/In-Depth Interviews 36 General Public	Measured characteristics related to adoption of Internet banking and innovations by Singapore consumers. The study identified eight influential factors of adoption: social desirability, compatibility, convenience, complexity, confidentiality, accessibility, economic benefits, personal computer proficiency.
21	Guru, B., Vaithilingam, S. , Ismail, N. and Prasad, R. (Malysia)	2000	Empirical	Internet banking was not available in Malaysia at the time of the study. Although government had undertaken great initiatives in supporting developments on the Internet, it still disallowed its banks from providing Internet banking services. The government's main concern was the security of these electronic transactions. Most Malaysian banking customers patronised the bank branches and found interaction with human tellers as important. However, over 60% of the respondents had Internet access at home and these represented a positive indication for PC-based banking and Internet banking in the future.

22	Howcroft, B., Hamilton, R. and Hewer, P. (UK)	2002	Empirical (Mail Survey/ Interviews/ Focus Group/Email 286 Consumers	The study concluded that consumers in the United Kingdom had a preference for a mix of banking delivery channels rather than exclusive reliance upon any one single channel.
23	Jayawardhena, C. and Foley, P. (UK)	2000	Empirical	The researchers concluded that satisfying the consumer needs, increasing competition, demand placed upon the supply chain and invention of new products and services were the main challenges to Internet banking.
24	Joseph, M. and Stone, G (USA)	2003	Empirical (Focus Group /Survey) 21250 Bank Customers	The researchers argued that the ability to deliver services via technology appeared to be correlated with high satisfaction with services which was deemed to be of high importance to customers.
25	Jun, M. and Cai, S. (USA)	2001	Critical Incident Technique 285 Customer Anecdotes	They Identified 17 key quality attributes of three categories of Internet banking products and services: customer service quality, online systems quality and banking service product quality with six attributes as key dimensions: responsiveness, reliability and access/ease of use, accuracy/product variety/ diverse features, respectively.
26	Karjaluoto, H., Mattila, M. and Pento, T. (Finland)	2002	Empirical (Mail Survey) 1,167 Bank Customers	The study concluded that attitude towards online banking and actual behaviour were both influenced by prior experience of computers and technology as well as attitudes towards computers.
27	Erikkson, K, Kerem, K. and Nilsson, D. (Estonia)	2005		Internet banking use increased as long as customers perceived it useful. The perceived usefulness was central because it determined whether the perceived ease of Internet banking use would lead to increased use of the this type of delivery medium. A well-designed and easy to use Internet banking services system might not be used if it is not perceived as useful. It was concluded that the perceived usefulness of Internet banking

				is, for banks, a key construct for promoting customer use. It was suggested that models of technology acceptance should be re-formulated to focus more on the key role of the perceived usefulness of the service embedded in the technology.
28	Khan, B.S. (USA)	2004	Empirical	The researcher used data from the U.S. for 1998 and 2001. Tested whether online banking use was affected by the distance to the closest bank branch which proved not to be the case. Household income and education positively and significantly affected adoption. Technical competence and financial sophistication positively impacted adoption. Impact of various individual and bank specific characteristics on online banking use had changed from 1998 to 2001.
29	Kolidinsky, J., Hogarth, J.M. and Hilgert, M. (USA)	2004	Empirical (Longitudinal /Monthly Phone Survey) 500 Households	Applied TAM and Diffusion of Innovation Theory to the adoption of three e-banking technologies: automatic bill payment, phone banking and pc banking. Relative advantage and compatibility were significant and positive for all e-banking products. Triability, simplicity, observability, risk and safety were not significant across all three technologies. There were significant age differences for phone banking and pc banking. Education and income had positive impacts on the likelihood of adoption of the products which confirmed that income and education levels played a strong role in the adoption of a variety of technologies.
30	Laforet, S. and Li, X. (China)	2005	Empirical (Survey, Sample) 300 General Public	The study attempted to ascertain the extent of online and mobile banking in China by establishing its market status, identifying the target customers, the demographic characteristics of users and non-users and comparing their attitudes toward electronic banking adoption. It concluded that online and mobile banking were still at early stages in China with low level of awareness and consumer attitude as major obstacles to adoption of online and mobile banking. Security was found to be the most important attribute that could motivate consumers' attitudes toward adoption in addition to perceived risk, computer and new technological skills and Chinese habit of cash-carry banking. Mobile banking suffered lack of understanding of the concept and benefits on the part of the Chinese consumers. Online and mobile bank users tended to be predominantly male, not typically young neither highly educated.

31	Lai, V. and Li, H.	2005	Empirical	The researchers applied TAM to understand technology adoption. The study concluded that the TAM construct was invariant for sample used across different gender, age, and IT competence subgroups. Those findings suggested that male and female, old and young, IT expert and novice conceptualised the TAM construct in very similar ways, and subsequently allowed to understand TAM's validity in technology acceptance research.
32	Lassar, W. M. and Dandapani, K	2003	Empirical (Survey) 471 University Students	This study investigated how users perceived the Internet's abilities to conduct banking activities. Results showed variation in media perceptions for the same online banking site across various task environments. The results indicated that user perceptions of the Internet medium depended on task complexity and that technology can serve as a mitigating factor to improve media and quality perception.
33	Lassar, W., Manolis, C., and Lassar, S.	2005	Empirical (Web Survey) 349 Business School Students	Integrated the Technology Acceptance Model (TAM) and adoption of innovation framework to develop predictions of online banking acceptance. While results confirmed the positive relationship between Internet-related innovativeness and online banking they also showed that general innovativeness was negatively related to online banking. They concluded that results might be generalised to telephone banking and electronic fund transfer (EFT) as these products, like online banking, require an active consumer role in using the product. Findings suggested that the type of consumer innovation mattered in understanding the adoption of e-banking processes. Their findings supported the notion that online shoppers were distinct from traditional non-online shoppers and highlighted the unique nature of purchasing financial versus non-financial products.
34	Li, S. and Worthington, A.C. (27 developed and developing countries)	2004	Empirical 27 developed and developing economies.	The study quantified the international relationship between the adoption rate of Internet banking and electronic connectivity. It concluded that aggregate electronic connectivity explained 29 percent of the variation in Internet banking adoption rates. The proportion of Internet banking customers would increase at various speeds relative to the increase in Internet connectivity, pc connectivity and mobile phone connectivity.

35	Li, F. (UK)	2001	Empirical	The study described four emerging Internet banking in UK: accepting the Internet as a new distribution channel which was added onto the existing model, e-banking was based on multi-channel banking in which the Internet was the integrative component, creating baby e-banks with their own e-brand name and product range, and an entirely new business model without a physical network.
36	Liao, Z. and Cheung, M.T. (Singapore)	2002	Empirical	Study concluded that individual expectations regarding accuracy, security, transaction speed, user friendliness, user involvement and convenience were the most important quality attributes in the perceived usefulness of Internet based e-retail banking. First five determined the willingness to use by consumers.
37	Liao, S., Shao, Y.P., Wang, H. and Chen, A. (Hong Kong)	1999	Empirical	Investigated adoption of virtual banking within the framework of TPB and found to be partially applicable to the context since the empirical research provided limited and weak support to the constructs of the theory.
38	Lockett, A. and Litter, D. (UK)	1997	Empirical (Mail Survey) 593 Bank Customers	The study used a model of the perceived innovation attributes and the personal characteristics of adopters and non adopters. It concluded that the most important perceived positive attribute of direct banking was its 24-hour-a-day availability whereas complexity and risk of service were the two negative attributes.
39	Machauer, A. and Morgner, S. (Germany)	2001	Empirical 285 Private Households and Students	The study identified four clusters of German bank customers: transaction-oriented, generally interested, service-oriented, and technology-opposed.
40	Mattila, M., Karjaluoto, H. And Pento, S. (Finland)	2003	Empirical	Study concluded that in addition to ease of banking and convenience, household income and education had significant effects on the adoption of Internet banking among mature consumer. Perceived difficulty in using computers combined with the lack of personal service in e-banking were found to be the main barriers.
41	Maude, D., Raghunath, R., Sahay, A. and Sands, P.	2000	Report	The report found that mobile data communication was already extending the Internet to people on the move; interactive TV could bring it to those who cannot afford to have a PC at home. Financial-service providers who were keen to compete on the Web need to understand how these two new routes into it might evolve.

42	McKechnie, S., Winklhofer, H., and Ennew, C. (UK)	2006	Empirical Telephone Survey 300 General Public	Researchers applied TAM model which was helpful but additional links need to be included. The key drivers of extent of use were past experience with the Internet as a purchasing channel and attitudinal aspects, such as positive emotions towards the Internet as a distribution channel for financial services (FS). Insecurity about this channel did not appear to be an obstacle and perceived usefulness was not directly linked to extent of use but fully mediated via attitude towards the channel. Consumers with computer access from home, those with an active interest in FS, as well as consumers who had general online purchasing experience tended to find this channel easy to use, which, jointly with perceived usefulness, led to a positive attitude toward this distribution channel.
43	McPhail, J. and Fogarty, G.(Australia)	2004	Empirical	Studied diffusion of self-service banking technologies (SSBT) into mature consumer market (50+). Found that electronic banking was a central part of the lifestyle of many older consumers. Identified 3 segments: nonusers, lower users and medium to high users. The first two categories preferred the customary way of conducting transactions and enjoyed the personal interaction with bank personnel but they both had a moderate level of credit card use. The third category of users embraced a range of SSBTs and used credit cards to facilitate their financial activities.
44	Mols, N.P. (Denmark)	2001	Empirical	Study found that management support and future orientation were the most important factors driving the introduction and exploitation of the new delivery channels.
45	Mols, N.P. (Denmark)	2000	Empirical	Investigated Internet banking from the service provider perspective. Grouped Danish bank managers according to their attitudes towards Internet banking: nervous, positive, sceptics, and reluctant.
46	Mols, N.P., Bukh, P.N.D. and Nielsen, J.F. (Denmark)	1999	Empirical	This study reconfirmed that the consumer acceptance of new services would be the key factor in the development of distribution channel structure in the future.
47	Moutinho, L. and Phillips, P.A. (Scotland)	2002	Empirical	Studied Internet banking from the banks' perspective. The study concluded that Scottish bank managers considered efficiency and enhancement of customer service as the two perceived advantages of Internet banking.

48	Moutinho, L. and Smith, A. (UK)	2000	Empirical	Studied the behaviour of established bank consumers in the U.K. and concluded that ease of banking and convenience were the two most important expectations. Emphasised that human and technology based delivery channels were greatly linked with the customer's perception of how these bank services were delivered to them and pointed out that these perceptual outcomes would affect the level of bank customer satisfaction, retention, and switching.
49	Mukherjee, A. and Nath, P. (India)	2003	Empirical (Survey/Email Survey) 250 Internet Users	Concentrated on the concept of trust in online relationship marketing and tested a model of trust in which: shared value, communication, opportunistic behaviour were taken as antecedents of trust. Concluded that both shared value and communication played a significant positive role on trust and that trust had a significant influence on commitment.
50	Nath, R, Schrick, P. and Parzinger, M. (USA)	2001	Empirical	Study found that average transaction cost of $1.07 at a full service bank was reduced to $0.27 at an ATM, and fell to about a penny if the transaction was made on the Web. That cost savings, access to additional services and convenience were among the main benefits of Internet banking. However, Internet banking was still in its nascent stage and its full benefits were still to be realised by banks. Bank managers' attitudes towards and perception of electronic channels were of critical importance.
51	Ozdemir, S., Trott, P. and Hoecht, A. (Turkey)	2008	Empirical Questionnaire 155 Convenience Sample	Concluded that there were significant differences between adopters and non-adopters of the service in terms of their perceptual, experience and consumer related characteristics. Internet banking adopters perceived Internet banking use as less risky, more user-friendly and more useful compared to Internet banking non-adopters. Internet banking non-adopters who intend to use the service in the future (later adopters) perceived Internet banking use as less risky and more useful compared to non-adopters who do not intend to use the service (laggards). Internet banking adopters were also found to have more experience with mobile Internet, and have higher income and longer working hours.

52	Patricio, L. , Fisk, R. and Cunha, J. (Portugal)	2003	Empirical/ Qualitative 510 Internet Banking Users	The study emphasised the critical importance of understanding and improving the contribution of each channel within the overall services offering rather than concentrating efforts on improvements to each service delivery channel in isolation.
53	Pikkarainen, T., Pikkarainen, K., Karjaluoto, H. and Pahnila, S. (Finland)	2004	Empirical (Survey) 427 General Public	As a result of a focus group interview with banking professional, TAM literature and electronic banking studies, a model was developed indicating online banking acceptance among private banking customers. It was found that perceived usefulness and information on online banking on the web site were the main factors influencing online banking acceptance.
54	Polatoglu, V.N. and Ekin, S. (Turkey)	2001	Empirical/ Email Survey 114 Bank Customers	Early adopters and heavy users of Internet banking services were more satisfied with the services compared to other customer groups. Listed 9 factors that influenced the diffusion of electronic banking: relative advantage, observability, trialability, complexity, perceived risk, type of group, type of decision, and market effort. Concluded that those customers who used Internet banking for longest time or who used more of its services find Internet banking to be very reliable.
55	Rotchanakitumnuai, S. and Speece, M. (Thailand)	2003	Empirical (Interviews) Corporate Customers	Investigated online banking from the perspective of corporate customers in Thailand. The main barrier for corporate customers was seen as security concerns as they view the legal system as weak for handling Internet transactions.
56	Sathye, M. (Australia)	1999	Empirical (Mail Survey) 589 General Public	Identified security concerns and lack of awareness about Internet banking as the main obstacles to non adoption. Also young, educated and wealthy groups of customers were the most relevant customer segments for the rapid development of Internet markets.
57	Shih, Y. and Fang, K. (Taiwan)	2004	Empirical	Used decomposed TPB based on diffusion theory to study Internet banking decomposing the belief structure into multi-dimensional structures to improve the understanding of these relationships. Concluded that although people understand the advantages of Internet banking, many have yet to try it. They are unable to perceive

				whether Internet banking is compatible with their individual lifestyle or values. Subjective norm was found to be of no great importance in influencing intention to adopt online banking. Only self efficacy was found as a significant determinant of PBC while facilitating conditions did not influence perceived behavioural control.
58	Singh, A.M. (South Africa)	2004	Empirical (Web-Based Survey) 369 University Staff	The aim of this study was to determine respondents' reasons for not banking online and develop strategies for banks to get people banking online. It was revealed that more males used Internet banking than females. ATM usage was far greater than Internet banking. Security was the prime issue for those not banking online. Potential customers wanted guaranteed safety and loyalty rewards to get them to bank online. Internet banking showed the potential to grow amongst institution employees.
59	Thornton, J. and White, L. (Australia)	2001	Empirical	The study compared seven distribution channels (ATM, EFT, POS, credit card, cheque, human teller, telephone and Internet) with a set of variables affecting their usage. It Concluded that customer orientations such as convenience, service, technology, change, knowledge, computer, and Internet affected the usage of different channels.
60	Wan, W, Luk, C. and Chow, C (Hong Kong)	2005	Empirical/ questionnaire mall-intercept and telephone interviews 314 bank customers	The study sought to investigate factors that influenced Hong Kong bank customers' adoption of four major banking channels: branch banking, ATM, telephone banking, and Internet banking. Overall, ATM was the most frequently adopted channel, followed by Internet banking and branch banking, and telephone banking was the least frequently adopted channel. Psychological beliefs about the extent to which a channel possessed certain positive attributes were more predictive of adoptions of ATM and Internet banking than adoptions of branch banking and telephone banking.
61	Wang, Y.S., Wang, Y.M., Lin, H.H. and Tang, T.I. (Taiwan)	2003	Empirical (Phone Survey) 123 General Public	Tested applicability of an extended version of TAM on Internet banking and found evidence that perceived ease of use, perceived usefulness, and perceived credibility all had a significant positive effect on people's intention to adopt Internet banking. It also demonstrated the significant effect of computer efficacy on behavioural intention through perceived ease of use, perceived usefulness and perceived credibility.
62	White, H. and Nteli, F. (UK)	2004	Empirical	Despite recent advances to improve Internet banking security, it still remains the key concern for customers. There are different segments of customers with different priorities and perspectives. Study identified a group of customers interested in

				convenience-related attributes. Identified five key attributes of Internet banking service quality: responsiveness of service delivery, creditability of provider, security, ease of use and product variety/diverse features.
63	Yakhlef, A. (Sweden)	2001	Empirical	Studied Internet banking from the banks' perspective. Banks were responding to the Internet differently and those which see the Internet as a complement and substitute to traditional channels, achieved better communication and interactivity with customers.
64	Yousafzai, S, Pallister, J. and Foxall, G.	2005	Empirical/ Experiment	The study examined the effectiveness of potential trust-building strategies for e-banking and their impact on online customers' perceptions of trustworthiness of the bank, by specifically focusing on the information clues presented on the bank's Web site. Structural assurance and situational normality mechanisms both had an impact on customers' trustworthiness perceptions, suggesting that banks needed to use a portfolio of strategies to build the customer's trust. The results further suggested that communication of meaningful and timely information had the potential to influence customers' trusting intentions.
65	Yavas, Y. and Shemwell, D.J. (USA)	1996	Empirical	Study concluded that bank's image was important relative to competitors which makes banks search for differential advantage and competitive edge. Banks needed to determine these images as they relate both to their own, and to those of their competitors as well as identify how consumers position various banks relative to each other in their minds. This knowledge would help banks design the necessary strategies to exploit their current positions in consumers' minds or, if necessary, reposition themselves. Also concluded that being first in introducing new distribution channels was a strategic tool for banks to separate themselves from competitors.

In summary, the previous studies showed that online banking is distinctively different in many ways from traditional brick and mortar banking. In the past, bank customers had the opportunity to develop a relationship with a bank's front desk employee who acted as a link between the customer and the bank's information system. However, with online banking, the technology enables bank customers to have direct access to the bank's information system which can be approached either from home, work, or any other location where a network connection is available (Pikkarainen *et al.*, 2006). The technology is being utilised to facilitate a number of service-providing situations and to manage the relationship between the service provider and the customer (Grant and Schlesinger, 1995; McKenna, 1995; Mulligan and Gordon 2002; Curran *et al.*, 2003; Walker and Johnson, 2006).

2.8 REVIEW OF ONLINE CONSUMER BEHAVIOUR STUDIES

A large number of theoretical and empirical studies have been conducted to explain online consumer behaviour, in particular the use of classical attitude-behaviour theories such as the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM) to understand both the adoption of online purchase of goods and use of online services. Some researchers like Al-Gahtani and King, 1999; Lederer *et al.*, 2000; Venkatesh, 2000; and Pavlou, 2003 extended the TAM model while concentrating on antecedents of ease of use, while others added additional components to the model in relation to the specific nature of their adoption research (Al-Gahtani and King, 1999; Venkatesh and Morris, 2000; Kleijnen *et al.*, 2004).

In 1989, Davis *et al.* Compared TAM and TRA to measure the effectiveness of each of these two models in explaining behavioural intention and how this latter is affected by attitudes and subjective norms to predict the user intention to adopt a word processing application (Appendix 5). The study was conducted using two sets of questionnaires distributed to participants

immediately after the word processing application was introduced and the other set 14 weeks after the introduction. It was found that TAM explained 47 percent of the variance in behavioural intention to adopt at the first time period and 51 percent at the second. On the other hand TRA explained 32 percent of the variance in behavioural intention to adopt at the first time period and only 26 percent at the second time. It was concluded that behavioural intention could be considered a predictor of system use explaining a significant system use at the second time (R^2= 0.12, β=0.35). However, it must be noted that the R^2 value is extremely weak which would make it quite difficult to categorise the behavioural intention in this case as a 'good' predictor. Attitude was a significant player in shaping behavioural intention in both sets of questionnaires (β=0.55 and β=0.48, respectively), while subjective norms proved to have an insignificant effect on behavioural intention in both times (β=0.07 and β=0.10, respectively). By examining the construct specific to TAM, usefulness, it was found that it had a strong effect on behavioural intention in this particular study which exceeded the effect of attitude and subjective norms in both times (β=0.48, β=0.61, respectively).

As a follow up to Davis, *et al.* study in 1989, Adams *et al.* Conducted a study of user perceptions and use of voice mail, electronic mail in 1992 (Appendix 5). They examined the effect of TAM constructs such as ease of use and usefulness on the actual use of two different messaging systems across ten different organisations. They concluded that usefulness had the most significant effect in both models (β=0.36, t=2.6 for electronic mail and β=0.31, t=1.82 for voice mail) which agreed with Davis *et al.*'s earlier research findings and showed that usefulness was a good determinant of behavioural intention or actual use when compared to ease of use.

In another study by Adams *et al.* presented in the same research paper in 1992 on 73 undergraduate and MBA students using TAM model to examine the use of three business software applications of word processing, spreadsheet and a graphics system, results show that TAM was a suitable model to study

information technology adoption. In the case of word processing software ease of use was found to be statistically significant (β=0.21, t=2.46) while usefulness was found to be insignificant (β=-0.03, t=-0.42). For spreadsheet software, usefulness was found to be significant (β=.846, t=2.97) and ease of use was not (β=-0.4, t=-1.8) while for the graphic system the opposite was true with usefulness found to be insignificant (β=0.06, t=0.24) and ease of use was significant (β=0.48, t=1.8). This variation in the significance results proved to be inconsistent with the earlier results obtained by Davis *et al.* in 1989. However, the researchers concluded that ease of use is a significant predictor with early adoption of new products, but with prolonged exposure to innovation, ease of use no longer becomes an important variable in determining usage as users become more proficient with the system on hand.

Later in 1993, Davis conducted another study to support the hypothesised relationships specified by the TAM model which he introduced in 1989 on 112 users of two different information technology applications, namely electronic mail and text editor applications. This study concluded that both usefulness and ease of use were significantly correlated with attitude (β=0.65 and β=0.13, respectively). Attitude of participants toward usage was also found to be significantly correlated with the system usage (β=0.21). However, these results showed that usefulness exceeded attitude in its correlation significance toward actual usage of system.

One of the early studies on online banking adoption was conducted by Barczak *et al.* in 1997. This study investigated consumer motives for use of technologically based banking services and distribution channels in the United States. They found that customers could be clustered on their money management philosophies, and described four motivational clusters including: security conscious, maximisers, and instant gratification and hassle avoiders. Each segment had different attitudes and behaviours toward different banking technologies.

In another study investigating the ability of TAM in predicting self-reported and actual use of electronic mail system by a sample of 61 graduate business students, Szanja (1996) produced a different set of results in terms that behavioural intention did not significantly affect actual usage of electronic mail usage. Usefulness showed a significant effect on the behavioural intention (β=0.72) while perceived ease of use did not significantly affect behavioural intention.

In 1999, Sathye attempted to quantify the factors that affected the adoption of Internet banking by Australian consumers (see Table 2.1). The sample for his survey was drawn from individual residents and business firms in Australia. He concluded that security concerns and lack of awareness about Internet banking and its benefits were the major obstacles to the adoption of Internet banking in Australia. Chi-square tests were conducted to determine the relationship between the respondents who were willing to use Internet banking and the four characteristics of personal respondents (age: 3.96, occupation: 5.05, income: 8.66, and education: 5.31). No correlation was found between the factors like age, occupation, income and education and interest in Internet banking. In addition, 75 per cent of the total respondents had security concerns. Further, 78 per cent of individual and 73 per cent of business respondents had also security concerns. This result suggests that individual respondents have more security concerns than business respondents. In addition, his results indicated that the security concerns were much higher (77 per cent), among those individual respondents who were aware about Internet banking, than the business respondents in this category (47 per cent) with 95 per cent of individual respondents who were aware about Internet banking but were not using it identified security concern as the reason compared to 64 per cent of business respondents.

In another study in 1999, Al-Gahtani and King utilised a modified version of TAM to analyse the usage of spreadsheet application software. Their modified TAM confirmed some of the relationships which were proposed in

the original version of TAM. It also demonstrated the usability of some added constructs to predict the behavioural intention to use the system in question. They found that some exogenous variables contributed to usage, such as compatibility with a total effect of 0.475, user rating of system quality with a total weak effect of 0.222 and training with another weak total effect of 0.177.

In 2000, Venkatesh and Davis proposed a new model, TAM2, which extended the original TAM to consider social influence and some cognitive factors in an attempt to identify determinants of usefulness and behavioural intention (Appendix 5). The study investigated the adoption of four different technological applications, namely personnel work scheduling application (system 1), a new mainframe operating system (system 2), an account management system (system 3), and a stock portfolio analysis application (system 4). As it was a longitudinal study, participants were surveyed at three different time intervals; before implementation (time 1), one month after introduction of technology (time 2), and three months after the introduction of the technology (time 3). For each of the innovations introduced, subjective norms influence on intention to adopt system seemed to be comparatively strong before implementation, then becomes weaker during implementation, and nearly becomes insignificant after three months of usage of software (system 1: β=0.11, 0.06,0.11; system 2: β=0.10, 0.08, 0.02; system 3: β=0.31, 0.26, 0.10; system 4: 0.28, 0.24, 0.08, respectively). This result which could be translated that when potential users have no experience of a new technology, they would seek opinions of others in forming their behavioural intention, but once they become users they gain first-hand knowledge about the system and the effect of the subjective norms decreases. This demonstrates the importance of subjective norms in forming the potential consumers' behavioural intention regarding the introduction of new technological innovation.

A more recent study applying TAM to the online retailing of financial services was conducted in 2006 by McKechnie *et al.* They collected their data using computer-aided telephone interviewing of 300 consumers in the United Kingdom who were over 18 years of age responding to a questionnaire. Researchers found out that TAM application was helpful but additional links were needed to be included. It was concluded that positive emotions toward the Internet (β=0.165) together with past purchasing experience (γ =0.454) determine the extent of use of the Internet as a distribution channel for financial services. However, insecurity emotions and perceived usefulness were found not to be linked to the extent of use. Perceived usefulness and ease of use were found to strengthen positive emotions (β=0.331, β=0.123, respectively), and reduce insecurity emotions (β=-0.192) while past online experience increases positive emotions (γ =0.302) and has a diminishing effect on insecurity emotions (γ =-0.204). Those results support previous finding on the TAM model research. Results also indicated that perceived ease of use and perceived usefulness did appear to be affected by some consumer demographics such as age, income and gender.

In their study, McKechnie *et al.* (2006) clarified that their use of "emotions" stems from the description provided by Bagozzi *et al.* (1999) who drew important distinctions between "affect" as a general term for mental feeling processes, which are broadly composed of "emotions" (i.e. mental states of readiness arising from cognitive appraisals of events or thoughts), and "attitudes" (which may be instances of affect or more narrowly defined as an evaluative judgement, possibly comprising an affective and cognitive dimension). This use of the term "emotions" may confuse the reader when evaluating the results of such a study as those emotions are in fact perceptions and evaluations on the part of the users. Therefore, it would have been simpler to label them as "positive perceived security" or "negative perceived security".

2.9 EVALUATION OF TECHNOLOGY ADOPTION STUDIES

In this section a general critique of most of the studies previously discussed in this chapter is presented.

Although past research conducted in this area was instrumental in setting up the foundations for this research and the selection of the variables for the model proposed, some weaknesses of the literature investigated are worthy of consideration here.

The research framework adopted here is based on two leading behavioural and technology adoption models and are cited in most of the studies available on technology adoption research. However, the Technology Acceptance Model when put forward by Davis (1989) was the results of a study carried out on business school students (MBA students). The usual user population in most TAM-based studies were knowledge workers and students in different organisations and universities (see Appendix 5). These users constitute large numbers and a great diversity of users' base. Davis proposed that two constructs, perceived usefulness (PU) and perceived ease of use (PEU), are the fundamental determinants of user acceptance, and can be used to predict adoption. He also concluded that PU is the better predictor of acceptance, "ease of use may be an antecedent to *usefulness,* rather than a parallel, direct determinant of usage" (Davis, 1989, p. 334). When taking into consideration the population of his research and their background, this conclusion would be expected to some extent from a sample that has the expertise in the field of information technology or related business fields.

In addition, Taylor and Todd (1995a, 1995b) studied the use of a computer resource center by business school students. Again, the learning curve of technology of this sample could also be considered high compared to the general public. Another major study of adoption of home computers

(Venkatesh and Brown 2001, p. 81) did not distinguish between different population groups and it only reported the mean values for variables such as income for the sample and the whole population and it failed to report on their employment status or qualification levels.

Also, people in general do not have stable intentions that can project forward in time to know about their future perceived usefulnesses of technologically based services and their plans for their behaviour. It would be more likely that people would form and reform their plans and intentions as their environments change around them. Therefore, it would be considered that behaviour of people with less experience and skilled users of information technology is consequently less amenable to analysis by the Technology Adoption Model and the Theory of Planned Behaviour. Therefore, some of the limitations of TAM can be explained through its intended focus on the business environment and, for the Theory of Planned Behaviour, on adoption intention of technology not its use, and people's experiences with it.

Another major critique of the majority of the previous studies investigated which tried to explain the adoption of technology behaviour is the type of the research conducted. The sample studied in most of those studies was cross-sectional with very few exceptions. To provide a better understanding of a continuously dynamic variable such as behavioural intention, it would be more appropriate to study it by using longitudinal studies. Such use of closely observed sample, the realisation of intentions expressed at some point would be more accurately measured and an explanation of the formation of the variables that affect it could be logically validated.

In addition, a similar pattern in the technology diffusion research, i.e., the dominance of research papers dealing with the attributes of innovations (especially relative advantages, risk, complexity, and compatibility) and the individual characteristics of adopters (especially the demographic variables) (e.g., Black *et al.*, 2001; Polatoglu and Ekin, 2001; Eastin, 2002; Karjaluoto *et*

al., 2002; Gerrard and Cunningham, 2003; Eriksson *et al.*, 2005; Lee *et al.*, 2005). Researchers claim that attributes of technology and individual characteristics are the key determinants of the rate of adopting online banking and the same type of studies were applied in a number of countries around the world. There is a need to identify another set of traits of Internet banking itself as a technology as well as studies that identify certain traits that are unique to certain countries or cultures.

2.10 SUMMARY

Research on online banking remains inconclusive. There are conflicting results with respect to the relative importance of the factors that explain online banking adoption (Ndubisi and Sinti, 2006). There was a shift of study focus from North American and European countries to other countries since in the early years of online banking research the largest proportion of studies focused on Western countries. However, in the last few years a considerable proportion of this research focused on Asian countries with few on African countries. Nevertheless, research about the technology adoption in the Middle East countries is still scarce.

Many studies cited analysed the impact of adopters' demographic variables such as income, education, and age on the rate of online banking diffusion (e.g., Ostlundt, 1974; Sathye, 1999; Jayawardhena and Foley, 2000; Polatoglu and Ekin, 2001; Howcroft *et al.*, 2002; Akinci *et al.*, 2004). In addition to socioeconomic status, however, there are many important differences between the two categories of adopters/non-adopters and early adopters/late adopters in personality variables and communication behaviour. The adoption of an innovation such as online banking is influenced not only by those innovation and adopter variables but also by some system and social factors, among which organisational innovativeness, government regulations, and opinion leadership had commonly been discussed (e.g., Bradley and Stewart, 2003;

Gurau, 2002) whereas industry trends, change agents, and social norms were largely neglected.

2.11 Relationship Between Described Perspectives and the Research

Investigating the three main theoretical perspectives, TRA, TPB and TAM, provided a basic understanding of how consumers go through the decision making process when adopting new products and services. It also described the online banking situation and the various angles it has been studied from.

In Chapter 4 all perspectives will be integrated to present a research model that will be utilised to examine the intention to adopt online banking services in Bahrain.

However, first it is necessary to set the 'scene' in terms of the context of Bahrain, its development, economy and culture. This is presented in the next chapter.

CHAPTER 3

BAHRAIN: AN OVERVIEW

3.1 INTRODUCTION

This chapter provides background on Bahrain highlighting several relevant issues to the topic under investigation. The chapter starts with general information about the country, with a brief discussion of the macro-environment of Bahrain. The banking sector is then discussed together with the information technological advances which the country has witnessed during the past two decades. Relevance to the topic under study will be emphasised in the discussion of each of the development aspects of the country and carefully analysed. The chapter concludes with a summary of the issues related to online banking in Bahrain.

3.2 MACRO-ENVIRONMENT ANALYSIS OF ONLINE BANKING IN BAHRAIN

3.2.1 *Demographics*

According to the national statistics compiled by the Bahrain Central Informatics Organisation, the population of Bahrain has jumped from 742,561 in 2006 to 1,046,814 in 2007 (Central Bank of Bahrain, 2008 Economic Indicators – Appendix 4). The median age is 29.4 years (32.4 years for men and 25.8 years for women) (2006 estimates). Figure 3.1 shows the drastic increase in population in the past five years which could be inferred to new government policies. Although, with a growing population, the potential outlook for adoption of online banking services in Bahrain may seem to be

more optimistic, there are other issues that arise simultaneously with the increase in the population size of the country over a short period of time.

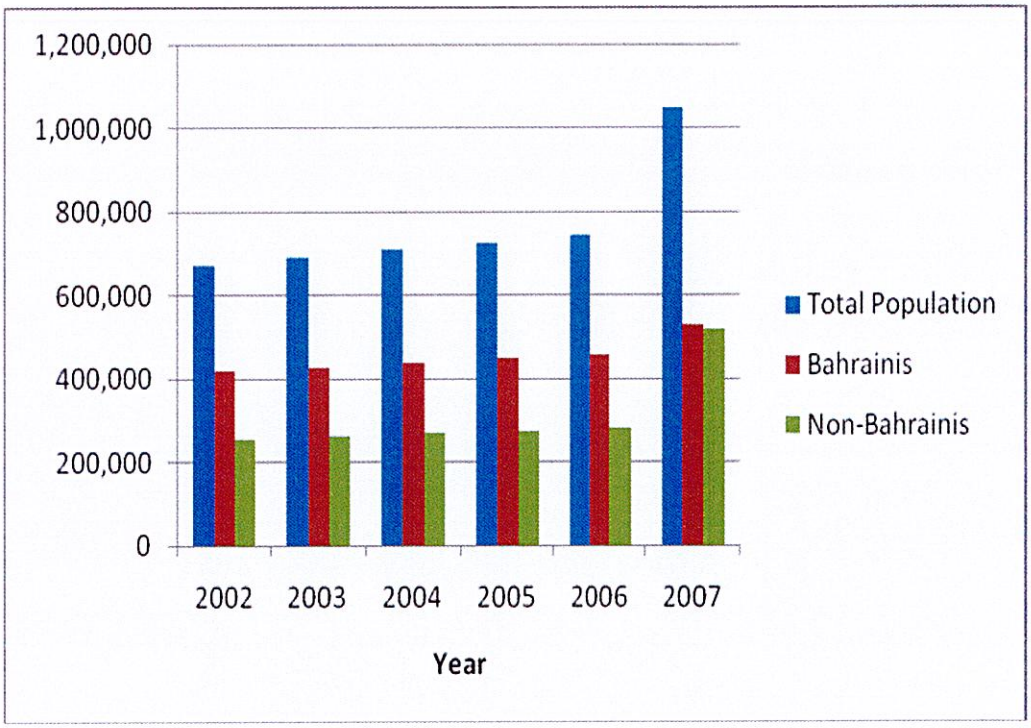


Figure 3.1: **Total Population of Bahrain (Bahrainis and Non-Bahrainis)**
Source: Bahrain Central Informatics Organisation, February 2008

Nevertheless, this influx of expatriates to the country in such a short period of time may represent a major problem with regard to the quality of the current Internet services being provided due to the sudden increase in potential Internet users. The telecommunications infrastructure development and upgrading could have been planned over a certain period of time in Bahrain and not immediately. Therefore, a gap may be created between the population size growth rate and the infrastructure development rate which may result in poor quality of Internet services for everyone.

According to the Central Bank of Bahrain (CBB) Economic Indicators for the year 2008 (Appendix 4), employment levels in Bahrain for the year 2007

indicate that there is a decrease in the total number of employees for the fourth quarter of 2007 when compared to the previous quarter of the same year (from 397,9081 to 379,471 employees). The implications for such a change may reflect negatively on the online banking adoption potential as less people will have money deposited into their bank accounts on a regular basis which in turn decreases the number of bank customers in general. However, the first quarter of the year 2008 witnessed a reverse in this situation and the total employment percentage increased by 8% from the fourth quarter of 2007. This increase in the labour force size is mainly due to the increase in the population size.

The private sector in Bahrain provides employment for approximately 72,820 Bahrainis according to the latest statistics of the Government of Bahrain, Figure 3.2. However, it is important to emphasise that the public sector in Bahrain includes all government-owned organisations and ministries. Those public establishments are the primary suppliers of services in the country such as education, commerce, development, health, and security. All employees of the public sector are under the umbrella of the Civil Service Bureau in terms of regulations and the Pension Fund for financial compensations. On the other hand, the data of the employees of the private sector represented in Figure 3.2 include all employees in the privately-owned businesses regardless of size and which compete in order to maximise profits. The employees of this sector are under the umbrella of Ministry of Labour in terms of rules and regulations and the General Organisation for Social Insurance (GOSI) for all financial compensations. Although the majority of the commercial banks in Bahrain fall under the private sector category and they are considered one of the most highly paid sectors, the banking segment employs only 8608 people (Central Bank of Bahrain Annual Report, 2007).

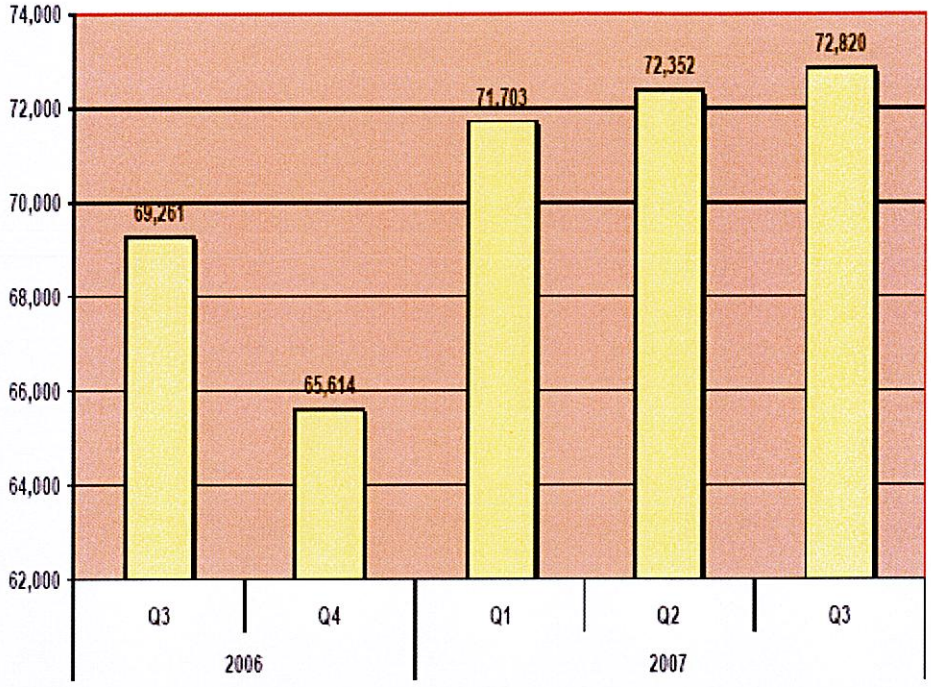


Figure 3.2: **Total Bahraini Labour Force Size in the Private Sector - Males and Females (in thousands)**
Source: Bahrain Informatics Organisation and General Organisation for Social Insurance

However, when considering the population of the whole country of Bahrain (Bahrainis and non-Bahrainis), the private sector is the major employer of the labour workforce (90.4%) (Appendix 4).

Salaries are low in comparison with other Gulf region countries such as in the United Arab Emirates and Kuwait. The public sector salaries are higher than those paid for the private sector employees (Figure 3.3). In relation to online banking in Bahrain, this fact may represent an obstacle to the popularity of this banking channel as people may not have sizeable funds in their bank accounts to transact online with.

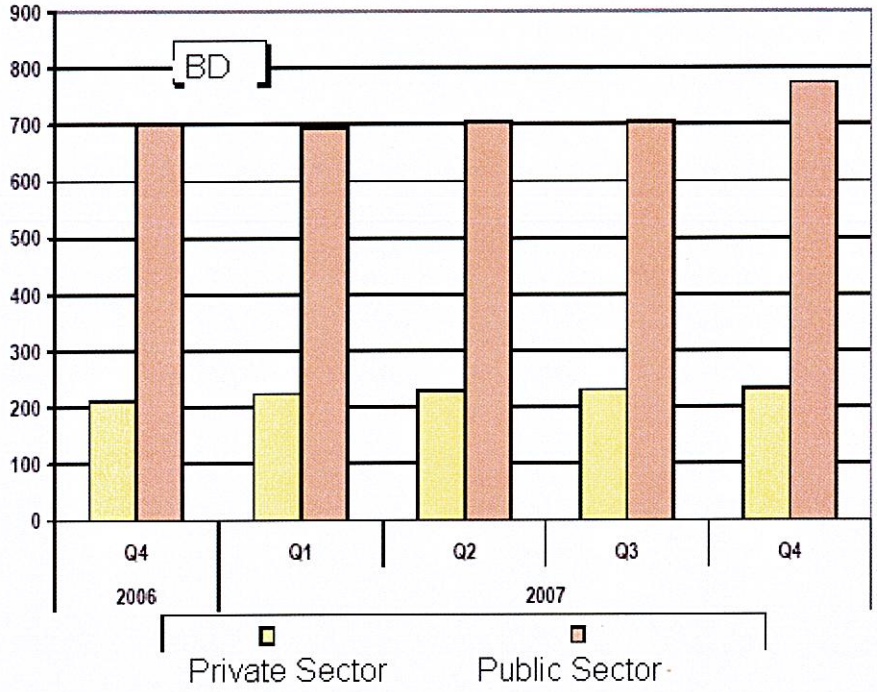


Figure 3.3: **Average Monthly Salaries for Private and Public Sectors in Bahrain (as of February 2008)**
Source: Civil Service Bureau and General Organisation for Social Insurance, Kingdom of Bahrain

3.2.2 *Social Environment in Bahrain*

Being an Arab, Muslim and Middle Eastern country, Bahrain shares the same characteristics of the collectivist nature of such cultures. The role of the extended family is powerful and can be noticed particularly in the interpersonal relationships among its members and the influence of the close-knitted family is quite evident in many aspects of the lives of its members (AlHashemi, 1987). Members of such a society exhibit care and devotion (Al Ismaily, 2006) and the behaviour of individuals reflect those characteristics. Therefore, it could be assumed that the receptivity of Bahraini's to accept change is not the same as in Western individualist societies with regard to online banking adoption.

On the other hand, the country has witnessed many changes over the past two decades due to the government encouragement of exposure to Western societies. Subsequently, this exposure introduced changes within the individuals such as being more open to new ideas, challenges and changes.

3.2.3 *Technological Environment in Bahrain*

Currently, Bahrain has a single telecommunications company which is Bahrain Telecommunications Company (BATELCO). BATELCO has a monopoly over the telecommunications market as well as data transmission and Internet services in Bahrain. The current level of BATELCO's services in Bahrain is adequate for the current need of the country with the current population size but major improvements must be introduced if Bahrain is to become a true information society (Al-Amer, 2003) and especially if the current trend of the increased population size continues.

The number of Internet users in the Arab world has increased by more than nine million in one year to reach 26.3 million by the end of 2005, according to a Madar Research report which was published in 2007. This led to a pan-Arab penetration rate of 8.50 percent in 2005, compared to 5.36 percent in 2004. The governments of the Arabian Gulf States have taken great initiatives to increase the usage of personal computers at educational institutions as well as at homes which played a major role in the growth of the Internet use in these countries (ESCWA, 2003). Although growth in the number of Internet users in the Arab world is much higher than world average – estimated at around 18 percent, Arab Internet user penetration is still well below the world average of around 14 percent by the end of 2005. The United Arab Emirates remains the Arab leader in terms of Internet user penetration rate in 2005, followed by Bahrain (Figure 3.4).

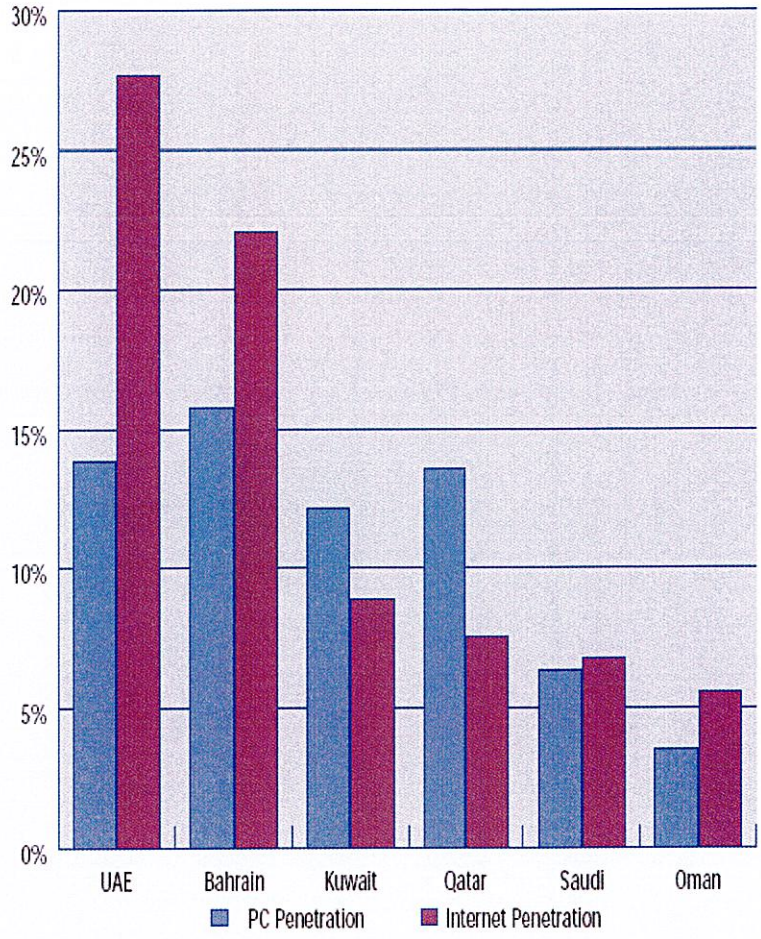


Figure 3.4: **Internet penetration versus PC Penetration in the GCC (2002)**
Source: Madar Research Report, October 2002, page 4

However, the number of Internet subscribers in Bahrain has increased by the end of the year 2007 to reach over 79,000 subscribers according to the latest data published by Telecommunication Regulatory Authority (TRA) in December 2007. This rise in the number of subscribers is shown in Figure 3.5.

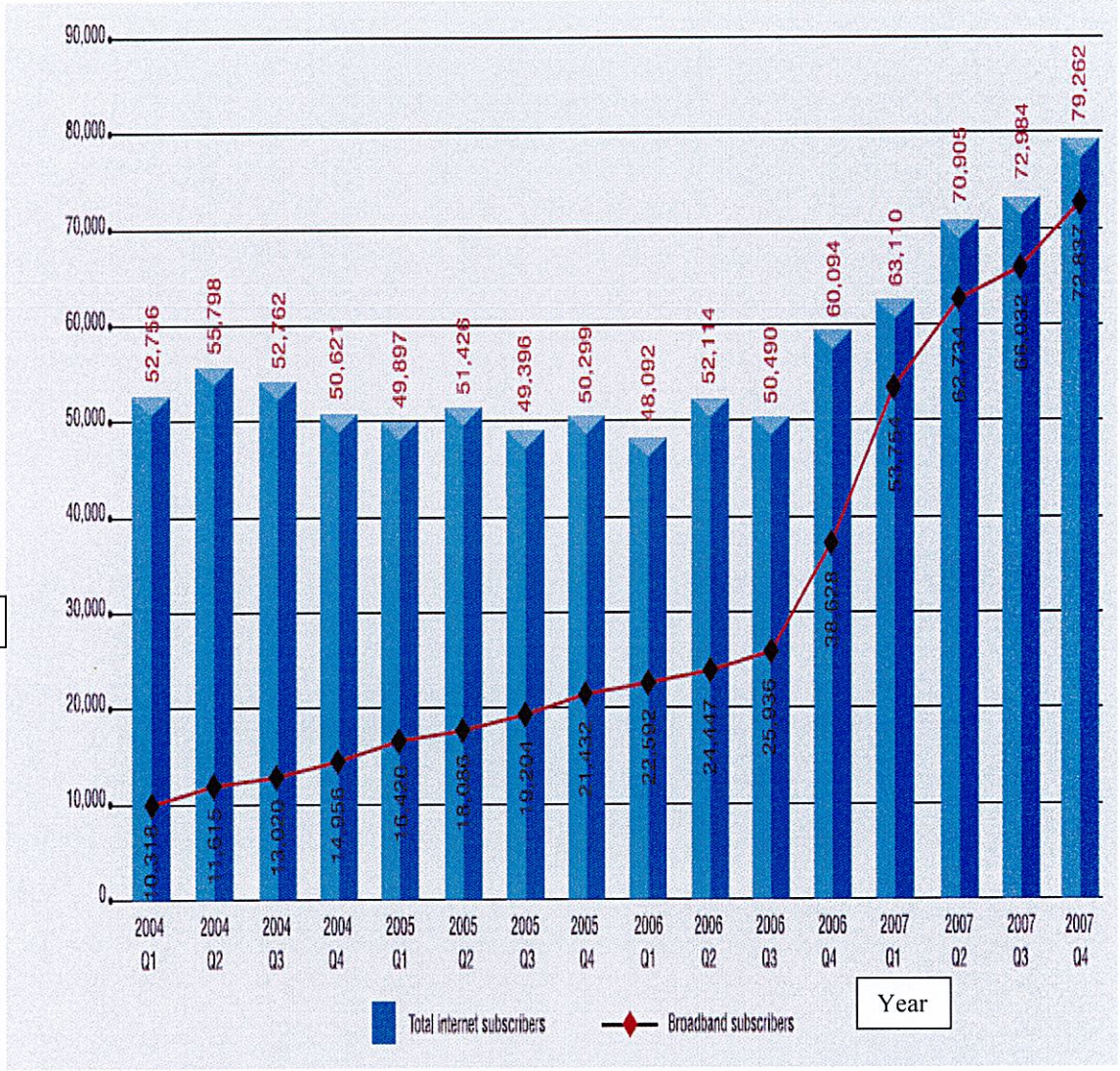


Figure 3.5: **Total Internet Subscribers in Bahrain**
Source: Telecommunications Regulatory Authority (TRA), Bahrain, 2007 Report

The rate of Internet penetration in households stands 53% according to the latest annual report of Telecommunication Regulatory Authority (TRA) in Bahrain. When this percentage is compared with another Western country such as the United Kingdom which is over 77%, the rate seems to be reasonable for a country of the size of Bahrain (694 sq km only).

However, the cost of Internet connection is much higher than those charged in European countries and some other Arab countries as shown in Figure 3.6. These high charges can play a significant role in the intention to adopt online

banking as people may not be willing to try to transact online while they have the alternative of visiting their local branch which would be cheaper and not very far. Such high prices would hinder the penetration of broadband Internet in the country. Access to high-speed Internet is considered a key contributor to the success for countries aiming to capitalise on information technology and pushing towards electronic government such as the case in Bahrain.

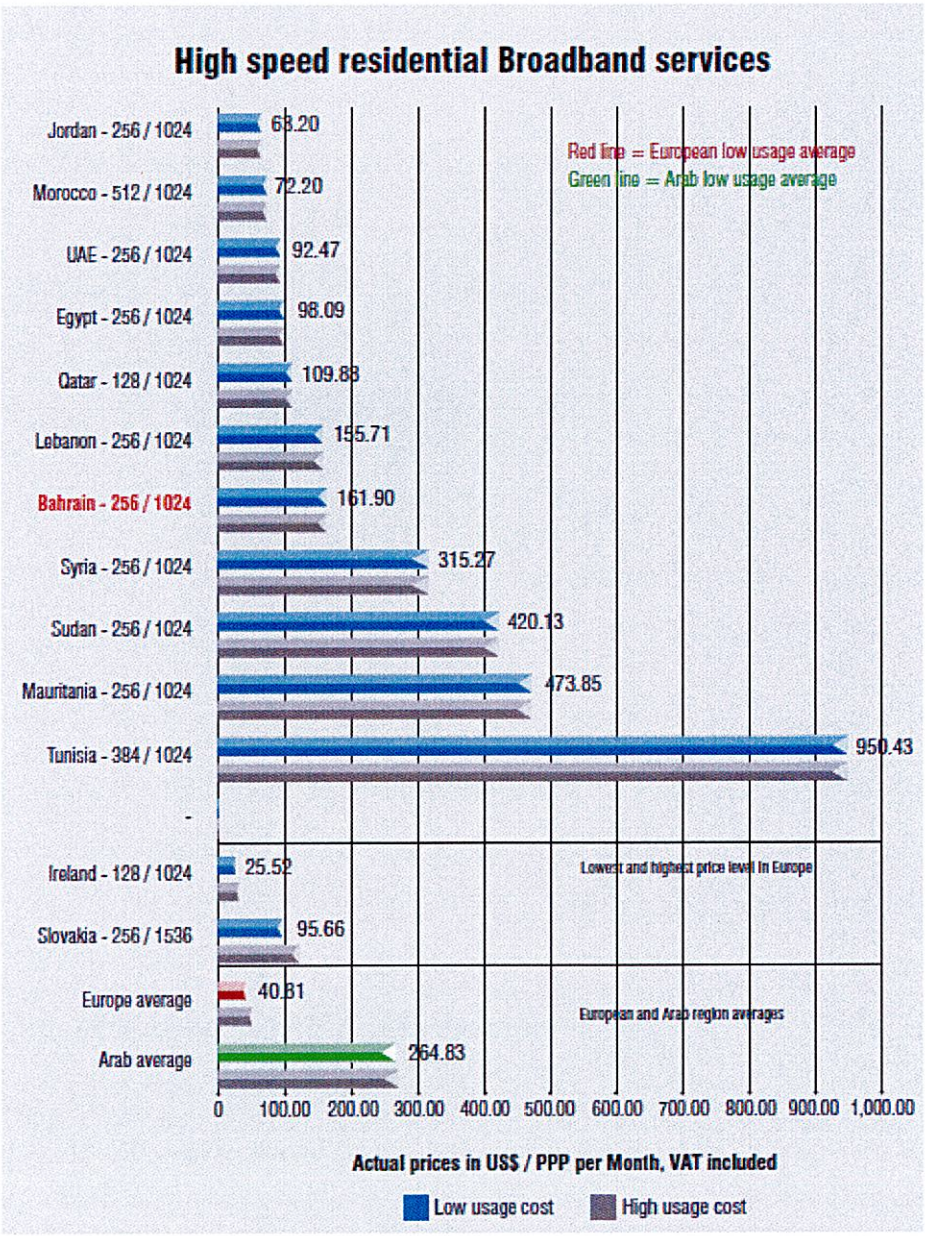


Figure 3.6: **Residential high Speed Broadband Service Charges**
Source: Telecommunications Regulatory Authority, Bahrain, 2007 Report

3.3 BANKING IN BAHRAIN

At the start of 2008, there were 149 financial institutions in Bahrain of which 29 were commercial banks: 15 were foreign-owned, and 14 were locally incorporated. The entire financial services sector is governed by the Bahrain Monetary Agency (BMA), an independent organisation which assumed the powers of a central bank in 1975. In 2006, BMA was officially assigned as the Central Bank of Bahrain (CBB) with the sole responsibility of ensuring monetary and financial stability in the Kingdom of Bahrain as well as regulating, developing and maintaining confidence in the financial sector (CBB Annual Report 2006).

The growth of this sector in Bahrain indicates the strength of the financial sector which performed extremely well and total banking sector assets rose to reach USD 187 billion, whilst financial sector licensees reached 376 by the end of 2006, a net increase on end of 2005's total of 365. This was accompanied with a significant rise in the total amount of deposits in the commercial banks to reach an approximate growth of about 7,400 million Bahraini Dinars by the end of the year 2007 (Figure 3.7).

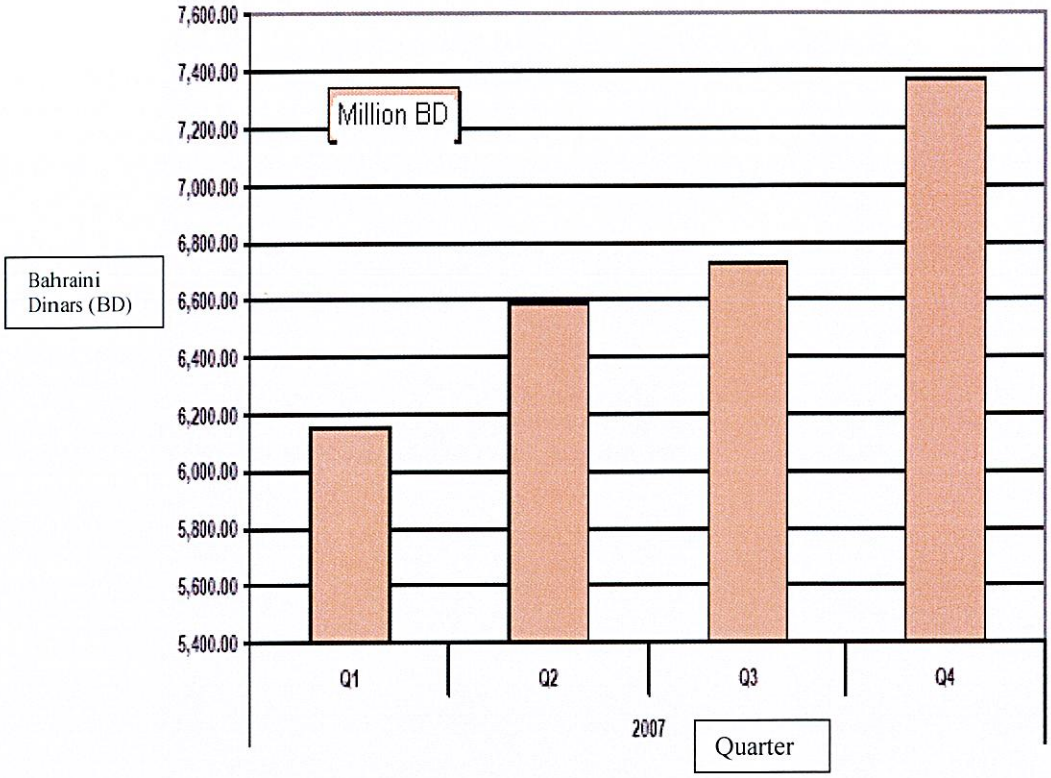


Figure 3.7: **Total Deposits in Bahraini Commercial Banks in 2007 (Million Bahraini Dinars BD)**
Source: Central Bank of Bahrain

3.3.1 *The Information Technology Revolution in the Bahraini Banking Sector*

Internet banking has made real headway in Bahrain, with adoption rate standing at around 20 percent of all Internet users – equivalent to the rate in many Western countries. However, this 20% adoption rate is moderate when calculated as a percentage of the total number of Internet users in Bahrain (53% of households). This could be due to several reasons such as the high cost of Internet connection rates and lack of awareness of the existence of these services on the part of the customers.

Several Bahraini – or partly Bahraini – banks are now offering online banking services, while most other banks are planning or implementing online services. The Internet banking thrust, spearheaded by a number of national banks such as Ahli United Bank, the Bank of Bahrain and Kuwait (BBK),

TAIB Bank, and ABC, has come at the right time which coincided with the telecommunication advances in the country and the financial sector prosperity and development (Al-Amer, 2003, Central Bank of Bahrain CBB, 2008 – Appendix 4).

There are two main Internet banking models: The integrated approach (click and mortar) and the stand-alone Internet bank (virtual). Most of the Arab banks have opted for the integrated approach whereby they keep their existing brand name and offer Internet banking services as an extension to their branch, ATM and telephone-based services. Egg Bank is an example of a stand-alone Internet bank in United Kingdom. Co-op Bank's Smile which offers check accounts, debit cards, credit cards, savings accounts and personal loans, is also a full stand-alone Internet bank. However, it is the case that the stand-alone Internet bank approach has been adopted mainly by small to medium-sized institutions or by major banks that do not have a large market share in a particular market or product.

The integrated approach is what this research will be investigating as Bahrain does not have a dedicated stand-alone Internet banking system at present. This could be the next step in online banking services to be offered in the country once the level of the current complementary online banking services prove to be successful and accepted by bank customers.

A simple comparison of the electronic delivery channels currently available among the commercial banks in Bahrain is listed in Table 3.1. It has to be noted, however, that phone banking in Bahrain is limited to a hotline through which the customer is guided through a recorded message to perform simple tasks as checking account balances, transfer between accounts, pay utilities bills and top up prepaid telephone cards.

Table 3.1: **Comparison of Electronic Delivery Channels in the Banking Sector in Bahrain**

Data Source: Bahrain Telecommunication Company & Bahrain Central Statistics Organisation, 2002

	ATM	*Phone Banking*	*Mobile Banking*	*Internet Banking*
Method of Delivery	ATM Terminal (onsite or offsite)	Phone	Mobile Phone	Personal Computer & Internet
Year Introduced	1988	1992	2001	1999
Introduced by		NBB	BBK	Ahli United Bank
Diffusion of Technology involved statistics	32 offsite 89 onsite	170/1000 persons 98,000 lines	330,000 mobiles 47% penetration	Internet 150,000 subscribers
Type of data output	Text, visual	Audio	Text	Text, visual
Actual cash exchange	Available	Not available	Not available	Not available
Where to be found	Streets, shopping malls, Anywhere (offsite)	Everywhere	Everywhere	Wherever there is pc and Internet connection
Presentation medium	Big screen	None	Small screen	Big screen
Method of interaction	Touch panel/big buttons	Push buttons	difficult with tiny buttons	Use keyboard and/or mouse
Mobility	Not available	Low	High	Low
Data storage capability	Not available	Not available	Not available	Available
Variety of Transactions	Limited	Limited	Medium	Medium – Large
Speed of Transaction	Fairly fast	Medium	Medium	Medium – Slow
Hardware medium fee responsibility	Bank	Customer	Customer	Customer
Connectivity fee responsibility	Bank	Customer	Customer	Customer

According to the Jordan Times in its issue on Sunday, 10 June, 2001, the writer of the article "Arab Banks Facing the Challenge of Online Banking" emphasised that consumers in the Arab world are becoming more sophisticated, both technologically and financially (Jordan times, 10/6/2001). Electronic banking registration rates among Arab banks' retail clientele suggest that demand is growing and will continue to rise rapidly along with Internet penetration in the region.

A 2001 report prepared by the Pyramid Research Consultancy, 'Africa/Middle East Perspective', concluded that out of the Middle East's top 100 banking institutions only 18 banks (with average asset value of $8.36 billion) offer online transaction services to their customers. The rest are roughly split between those with informational websites (43 banks) and those with no web presence (39 banks). However, as the findings of this report are outdated by now, it would be assumed that the 18 pioneers of Arab banks have set a regional trend and many of their local retail banking competitors are already busy making plans to follow suit as the case in Bahrain.

Such electronic banking services as current account management including payments of bills, personal loans, brokerage services, mutual funds and issuance of credit cards, are currently available in several Arab countries, including two local banks in Bahrain, three in Egypt, three in Jordan, three in Kuwait, four in Lebanon, one in Qatar, four in Saudi Arabia and five in the UAE (Pyramid Research Consultancy, 2001). However, the total number of those banks that offer such electronic banking services have risen since the statistics were presented in 2001. Bahrain today has five commercial banks that offer transactional electronic banking services on the Internet with varying degrees of comprehensiveness of features and services offered and more banks are currently working on the provision of these services to their customers (CBB Annual Report, 2008).

Adoption rates are high by global standards relative to the Arabian Gulf region's low Internet penetration. Around 14 per cent of Internet users in the Gulf countries where electronic banking is an option are registered to bank online; the equivalent figure in the US is 17 per cent (Jordan Times, 10/6/2001).

Before examining the status of web banking in Bahrain, it may be useful to look at the status of electronic commerce in general in the Arab world which may help in paving the way to the analysis of electronic banking. Jarrah (1999a) reported that Arab electronic shoppers spent approximately 95 million US Dollars in April 1998. Payments were made mainly by credit cards (82%), followed by bank transfers (11%), cash upon delivery (9%), and cheques (3%). Seventy eight percent of online shoppers said they believed fax transmission of private financial information was secure enough, versus telephone at 70%, and electronic mail at confidence of 50% (Jarrah, 1999a).

The above findings imply the existence of opportunities which banks can utilise to reinforce their electronic services and emphasise the security and confidentiality of information exchanged over the Internet relevant to online payments. But listing the opportunities is not the same as the real situation present at the moment and the anticipated growth of online services has not fully materialised yet. Many factors come into account when evaluating these percentages presented by Jarrah. It may be true that opportunities are available for the banks to establish and strengthen their online services but by taking into account the actual numbers of banks in Bahrain that are doing so, there is a discrepancy here. Only five banks currently have some kind of online transactional presence in Bahrain out of the total 29 commercial banks operating on the island. It would be reasonable to expect that a greater number of the banks would have active transactional web sites during this time since the publication of the study in 1999.

Jarrah (1999b) argues that the growth percentages in this industry are very impressive and are expected to spur the development of electronic business and other online services in the region. In Bahrain, banks are still at the very early stages of establishing their web sites and offering what is called a new generation of financial services.

From exploratory research conducted for this study, it has been found that online banking in general and in Bahrain in particular is increasingly used by banks to gain competitive advantages, operational efficiencies and direct marketing opportunities. By looking at the current situation of the commercial banks in Bahrain which offer a web presence, it can be noticed that the majority of these sites are used as an electronic form of a brochure that provide promotional information, financial reports, vacancies, opening hours, branch locations, and similar non-interactive services. In other words, most of the bank sites are structured to provide general information for the sole purpose of public relations and advertising. That is not real electronic banking.

Diniz (1998) reported that banks use the web to achieve three main objectives namely to market information, to deliver banking products and services and finally as a tool to improve customer relationship. Based on the extent to which the banks have exploited these three functional opportunities in their web sites, these sites can be described as informational, transactional, or as a customer relationship improvement tool. In addition, the quality of the web sites are also affected by the degree or level of interactivity which Diniz (1998) described as Basic, Intermediate and Advanced depending on the availability and usage of various features on the web sites as illustrated in Table 3.2.

Table 3.2: **Objectives of Online Banks Web Sites**
Adapted from Bank Web Site Evaluation Model (Diniz, 1998)

Function	Level of Interactivity		
	Basic	**Intermediate**	**Advanced**
Informational	Electronic Brochures, Means of Contact, Special Events	Search Engines, Reports Download, Economic Information	Subscriptions, Interface Customisation, Advertisements
Transactional	Opening Accounts, Check Book Requests, Card Requests	Balance Enquiry, Bill Payments, Funds Transfer	Electronic cash, Electronic Signature, Electronic Checks
To Improve Customer relationship	Electronic Mail, Suggestions Form, Complaints Forms, Feedback Forms	Advising Tools, What–if Calculations, Calculators	Videoconferences, Service Developments

The majority of the commercial retail banks in Bahrain which have web sites on the Internet are still at the first level stage where they are mainly informational in nature. Only five banks are currently at the transactional stage, intermediate level with continuous work to reach the advanced level of this stage with the government commitment to promote electronic commerce and introduce electronic government (e-government) to all ministries of the country. The basic level of interactivity of the third stage and main functions revolve around improving the customer relationship is present in the majority of the retail banks researched which host a web site.

An investigation of the web sites of the five commercial banks that allow their customers to conduct online banking transactions have a very limited number of services offered when compared with web sites of other international banks and foreign financial institutions. Table 3.3 presents a brief summary of the major services available on those web sites for the five Bahraini banks:

Table 3.3: **Major Services Provided by Internet Banking Websites in Bahrain**

	Information	**Balance Inquiry**	**Electronic Fund Transfer**
Type of service Available (Retail and Corporate Banking)	• Financial products • Stock market • Exchange rate • Annual Reports • Interest rates • Loan Limit • Loan/Interest Calculations • Document Request	• Account Inquiries • Account Summary • Balance Inquiry • Credit card balance • Personal check balance • Monthly Statement • Previous Monthly Statements	• Transfer between accounts • Loan repayment • Direct debits • Credit Card payments • Utilities bills payment • Standing Orders

However, it is important to emphasise that electronic banking is still a new technology despite its presence in some countries since the early 1980s. It took us considerable time to witness the major change from metal and paper money, to plastic cards, to smart cards, to online payments and fund transfers. Therefore, it is expected that it will be some time for the Bahraini banking sector to fully catch up with this new medium and make the best use of it.

3.4 ELECTRONIC BANKING ISSUES IN BAHRAIN

Roth (2001) identified the adoption rate of Internet banking in three Arab countries namely; Bahrain 17%, the United Arab Emirates 21%, and Kuwait 29% matched or exceeded the US adoption rate of 17%. This certainly shows that the Arabian Gulf countries have responded better to the challenges of electronic banking than many other Arab countries.

Despite the high rate of Internet penetration in the Middle East, Roth (2001) also outlined some of the factors which may act as main obstacles to the development of online banking in the Middle East.

a. Most of the wealth is concentrated among the older generation who are less Internet literate than the younger population. As research has found that older adults, for whom computers and the Internet were not a part of their child and early adult development, are at a disadvantage in contemporary society. Those disadvantages are in terms of access to electronic communication and online information and have even higher risks of developing information poverty than children do (Anderson *et al.*, 1995). In the case of Bahrain, the wealth is residing with a few well-established families that are mostly run by the older members of the family. Therefore, for a popular commercial bank in Bahrain that calculates its market share in terms of number of customers who actually do bank with it may not give the real picture of the situation as the number of the account holders may be high, but the total amounts deposited by those people may not be large.

b. The main arguments in favour of electronic banking such as time saving, convenience and increased efficiency may be less convincing in much of the region where the pace of life is slower and a visit to the bank branch may be viewed as an opportunity to socialise, gossip, or even have a chat with the branch manager (Guru *et al.,* 2003). In Bahrain, on many occasions, this bank branch manager would most probably happen to be a relative, a neighbour or a best friend. In addition, another consideration would be the societal structure of Bahrain and the possibility of having more male customers who may venture into the electronic banking arena than the female customers who may very much welcome the opportunity to go for a stroll and a chat to the bank and escape the four walls of their homes.

c. The absence of an adequate infrastructure may be another obstacle to online banking particularly with regards to connectivity. However, Internet services in Bahrain have been opened up to competition from the

private sector. Up to now BATELCO (Bahrain Telecommunications Company) has been the only company offering Internet access due to its monopoly over virtually all of the telecommunications, data transmissions and the Internet services in the country. New licences are now being offered as part of efforts to liberalise the telecommunications industry in Bahrain (ESCWA, 2003). Licences are now available for companies in both the Internet Service Provider (ISP) and Value Added Services fields. However, increasing capacity will be challenging because Internet service providers (ISPs) in the Arab world must apply to governments, which in most cases have monopolies on bandwidth, for international gateway access. The ISPs pay high fees for connections to government-owned international backbone operators, and then pass on these costs to end-users in the form of highly inflated rates for leased lines. As a result, the cost of high-speed access is typically sky-high for individuals and small businesses (Economist Intelligence Unit Report, 2002).

Even if the infrastructure and the connectivity issues were to be resolved, there would always be the question: 'What if the projections of the customers' base size are not large enough to justify the cost/benefit issue of the economic viability of going online with the bank services?' Banks would be faced with substantial financial losses represented by the expenditures made to provide the online banking services to an anticipated audience who may not be ready yet to make use of it. When online banking is compared to the ATMs, the case is different. Every bank account holder is provided with an ATM card upon opening an account and those machines are everywhere; they are practical as well as being quite user friendly. Therefore, customers' adoption of these cards was smooth and cannot be justifiably compared to Internet banking adoption in Bahrain.

From exploratory research, it was found that online services have been slow in coming to the Gulf countries, partly because of Gulf banks' tendency to

focus on the needs of corporate clientele. Online banking is perceived primarily as a consumer-based service although it provides similar services to corporate customers. Corporations in the Gulf are reluctant to use it, citing concerns about the security of their transactions. Their alternative choice is direct-dial access to the bank's mainframe, which for the past five years has been available to corporate clients in 85% of the Gulf's local and regional banks and nearly 100% of the region's multinationals (Economist Intelligence Unit Report, 2000).

3.4.1 *Cultural Issues Affecting Online Banking in Bahrain*

Consumers have an internal need to eliminate the uncertainty factor while adopting any new innovation or technology. However, by only addressing the positive aspects of an innovation, users are not prepared to deal with any of the negative features when encountered, thus increasing the probability of adoption failure (Griffith and Northcraft, 1996). Most of the articles discussing Internet banking concentrate on the positive features of this new delivery channel. Banks themselves when promoting their electronic services will not mention those other unfavourable scenarios when a customer uses this technology.

In order to better understand the attitudes, intentions, beliefs and behaviour of the Bahraini electronic banking consumer and the potential to adopt any new technology or a new product, it is essential to highlight the salient features of the Bahraini environment and culture.

Harris and Moran (1979) define culture as the unique life style of a particular group of people. As elsewhere, the behaviour of the Bahraini consumer is governed and heavily influenced by the social structure, values, norms and expectations of the other people. This precisely represents the subjective

norm variable of the Theory of Planned Behaviour (Fishbein and Ajzen, 1975) which was discussed in the previous chapter.

The society in Bahrain as in its neighbouring Gulf countries is formed on the basis of primordial ties such as family, friendship, religious affiliation and these are more pervasive and important than affiliation with a political party or a profession which are not as strong (AlHashemi, 1987). People in such collectivist societies as Bahrain would surround themselves with people and things that are consistent with their own identity (Tornatzky and Klein, 1982; Karjaluoto *et al.*, 2002). They would consider the word of mouth from a friend, a relative, a neighbour, or even a co-worker to participate in the decision-making process for simple matters such as where to buy their daily needs, for example. For a Bahraini where and how to bank is certainly a major decision-making process which would necessitate the referral to others before deciding to go online and try the banking services of one bank or the other.

On the other hand, a major benefit of electronic banking is saving time for the consumer and the reduction of long queues to do a simple banking transaction. However, one of the characteristics of the Bahraini society is the lack of appreciation towards time shown by the people with whom they interact. The concept of time value is rarely observed in our society where the norms of hospitality require politeness and overlooking the aspect of time (Allsmaily, 2006). Therefore, time may not be a very strong persuasive feature to promote to encourage customers to switch to electronic banking.

The transformations in infrastructure and the industrialisation and modernisation that are taking place in Bahrain are more or less superimposed on the same traditional, socio-cultural system. It could be argued that modern and traditional can and do co-exist in what is called the 'prismatic society' which is a society no longer totally traditional but not Western either (Riggs,

1964). But still the traditional way of doing things is deeply-rooted inside us and difficult to change.

Even if an attempt is made to consider Bahrain as a fairly modern society with a high rate of literacy (87.6%), in comparison to its neighbouring Gulf countries, it would be highly presumptuous to classify it as a fully open society who would embrace a new technology instantly. The move towards change and acceptance of new innovations would take some time to materialise until they become compatible with people's surrounding environment.

The implementation of Internet banking in Bahrain is taking place in a somewhat different environment and culture than in the West. Even in the West, observers have noted that technology may not be able to fully replace bank-customer relationships (Howcroft and Durkin, 2000). In general, Arab cultures place even more value on strong relationships in business. Bahrain is a high context culture. Communicated message in such cultures depends heavily on contextual and social cues for meaning, rather than being carried primarily in the words (Thatcher, 2001). Strong relationships are critical in high context cultures, because much of the message is absent when context does not accompany words (Rotchanakitmnuai and Speece, 2003). The strong family ties and the importance of the community lead Bahrainis to live in a society of conformity and collectivity rather than individualism and the appreciation of Hofstede's classification of "We" more than "I".

Culture is a very important intrinsic variable which differentiates each market from the other and it has to be considered carefully by banks before considering the introduction of electronic banking medium to the public. Neglecting this variable could cause the failure of this delivery channel and subsequently the providing bank could end up with great financial losses.

3.4.2 *Trust, Risk and Security Issues in Bahrain*

Electronic Banking is certainly in its infancy stages and has a long way to reach maturity. At the moment, it is being held back both by technical barriers and by issues of trust and risk (e.g. Tan and Teo, 2000). When considering the technical aspect of the problem, it is found that the barriers are bandwidth and delivery. Bandwidth restrictions coupled with graphics laden pages make the supplier's web pages frustratingly slow to view at the standard modem speeds such as those provided in Bahrain as the case with many other online retail websites (Clay and Strauss, 2000). Banks usually need to use a lot of graphics to enhance the layout of the website in addition to simplify the procedure to be followed by the consumer (Hoffman and Novak, 1996). All this will need a complicated set of instructions and special language to be used which would participate in the occurrence of page loading delays.

Trust as defined by Currall and Judge (1995) is as an individual's reliance on another party under conditions of dependence and risk. Considering that risk is a function of the probability that a hazard arises and the consequences of the hazard (Schneider, 1998), an individual's trusting behaviour depends on the nature of the consequences. Most of the research carried out in the field of marketing has broached the subject of trust while concentrating on two major dimensions of trust:

1. The role of trust in the relationship between partners involved in transactions, i.e. the service provider and the customer (e.g. Mayer *et al.*, 1995; Morgan and Hunt, 1995; Smith and Barclay, 1997); and

2. Culture and its influence on the development of trust (e.g. Triandis, 1995; Chen *et al.*, 1998; Doney *et al.*, 1998).

As Bahrain is a closely related society where blood relations are ubiquitous, it is not surprising to find that the social network has a strong influence on the decision-making process when it comes to trust. The word of mouth and personal referral system would influence the behaviour of the electronic banking consumer. This social network would help new users of this technology to overcome their initial trust obstacle.

However, Trust is interwoven with risk, because it reduces the risk of falling victim to opportunistic behaviour (Yousafzai *et al.*, 2005). Trust is essentially needed only in uncertain situations since it effectively means to assume risks and become vulnerable to trusted parties (Hosmer, 1995).

Risk and risk avoidance when it comes to Internet banking, are of prime importance as reducing risk takes precedence over cost savings. Mayer *et al.* (1995) also attempted to describe trust as the willingness to assume risk, while the trusting behaviour is the assumption of risk. If the level of trust exceeds the level of perceived risk, then the person will engage in a risk-taking relationship. Since trust develops over time (Lewicki and Bunker, 1995), the level of trust an individual has in an object would be different depending on the time when trust is assessed. When the person have no prior knowledge of electronic banking, then the initial trust in both the Web provider and the electronic channel through which the service is provided are of utmost importance. The question of trust may be even more important in the virtual world than it is in the real world. This is because the parties conducting the transaction are not in the same place, and therefore cannot depend on things like physical proximity, handshakes and body-signals (Ratnasingham, 1998). In addition, any one of the parties involved in the transaction may be in a completely different country, and a transaction on the Internet may not be subject to the laws of another country in which the buyer resides (Clarke, 1997).

When exchanging any kind of information via the Internet, customers may have the perception that there is a high level of risk even though the risk level may be actually low. In the case of online banking the bank and the customer are separated and it is not possible to predict what could go wrong. This physical separation is the source of this apprehension mainly on the part of the customer. The heightened risk perceptions of the customers affect the level of trust toward the online banking provider. Therefore, customers' technology orientation and perception of the technological competency of the electronic communication system are very important in their information processing behaviour and perceived trust (Mukherjee and Nath, 2003). Reputation is another dimension of trust. It arises from the strength of particular brand name, endorsement from trusted third parties and previous interactions on- and/or off-line (Egger, 2000). Therefore, the strength of the services offered by a particular bank which enjoys a solid reputation in the market could be supported by the positive experience relayed by relatives, friends or acquaintances about using the service in the past and those of the person who is considering using the service.

Relative to the Bahraini environment and which may be shared by some other developing countries, a major problem that is experienced by the Bahraini consumer and associated with electronic banking is the disruptive electricity power supply cuts. This is quite evident and frequent during the long, hot months of summer as the demand for electricity for air conditioning purposes reaches its peak, the power stations reach their maximum output capability and therefore power cuts occur. Furthermore, with the sudden increase in population size in Bahrain, the frequency of these power failures may increase due to the increased demand which is not matched with sufficient infrastructure to supply such capacity demanded.

In addition, the issue of connectivity is also another problem that has to be faced when it comes to electronic banking. Currently, Bahrain has only one Internet services provider which is efficient in terms of connectivity to a high degree. But, with the increase in the number of online users, there may be a limit that would be reached eventually when the available infrastructure is not sufficient to accommodate the flood of simultaneous users. This would clog communication networks, slow computer usage and make data-intensive computer use impractical. For now, Bahrain may have sufficient bandwidth to serve its comparatively small community of Internet users. But demand may rise rapidly due to the dramatic increase in the population size of the country as indicated in the demographics section of this chapter. This subsequently would lead to accumulated problems in communication capabilities such as shortage of bandwidth which will be a big obstacle and consumers would find that their trust in this delivery channel start to shake and accordingly their perceived risk increase.

Security and confidentiality of electronic banking is also positively related to trust. Once the user feels that the transaction performed via the Internet will be handled with the highest level of security and confidentiality, the grain of trust will prosper. In electronic banking, the banks need to store sensitive data on their customers (Bestavros, 2000). However, Bhimani (1996) as well as Furnell and Karweni (1999) concluded after a number of empirical studies that consumers are often reluctant to share personal information for fear that their financial life will become an open book to the Internet universe. Other researchers in the field of technology-based service provision also pointed out that consumers are afraid when it comes to using the Internet for electronic banking in case their personal financial information will be abused by unauthorised parties via the Internet (e.g. Culnan and Armstrong, 1999; Aladwani, 2001). The levels of security requirement in any electronic transaction conducted over the Internet are best described by Furnell and

Karweni (1999) in an attempt to assure the customers of the security and solidity of the transaction and the provider and summarised in Table 3.4.

Table 3.4: **Electronic Banking Security Requirements**
Source: Furnell and Karweni (1999), p. 373

Requirement	**Typical Considerations**
Security **at the user side**	• Physical access control to the machine • User authentication and authorisation
Security **during transport of data**	• Confidentiality • Data integrity
Security **at the merchant side**	• Secure storage of user information • User's privacy protection • Authentication of parties involved

Exploratory research revealed that all of the five commercial banks that currently offer transactional electronic banking services in Bahrain have adopted the 128-bit encryption as a requirement for the bank web site which is considered to provide significantly greater amount of cryptographic protection and is clearly cited on the banks' websites. All financial information that customers exchange with their bank, including account numbers and passwords, is encrypted before it goes out on a phone line or the Internet. Browsers would know that they are in secure, encrypted mode by displaying a lock icon, at the bottom of the screen. Encryption gives Internet transactions reasonable protection from unauthorised access, and a good software does not store unencrypted passwords or other sensitive information even on the customer's computer hard disk, where it could be exposed to illegal access by a poorly designed browser. In spite of all these assurances on the part of the banks, research looking into customer technology readiness suggests there are segments of customers who are simply not interested or ready to use the technology offered (Parasuraman and Colby, 2001).

A number of researchers (e.g. Furnell and Karweni, 1999, Tan and Teo, 2000; Mattila *et al.*, 2001) argue that consumers cite lack of security as the primary reason they are reluctant to transact online. But, at the same time, there are some consumers who routinely send credit cards numbers, and other details through the mail and over the phone to catalogue companies and offer this type of private card information to anonymous clerks at retail counters. Such contradiction may suggest that security may not be that crucial to the success of electronic banking on the Internet for some people.

With respect to the traditional banking practices and in particular deposit transactions the fact is that some consumers seem to value written verification of the basic facts of a banking transaction such as the name of the teller, a description of the amount deposited (whether it was in the form of cash or cheque), and the date as assurances measures. The bank teller would ordinarily offer the depositor a piece of paper containing those details and confirming the transaction. Consumers may want their use of electronic banking to create similar information. Also, responsibility must be determined in advance when financial losses occur in Internet transactions, and losses must be borne by the bank, the customer, or even other related parties in the Internet banking system, such as the Internet service provider (Thomas *et al.*, 1998; Rotchanakitumnuai and Speece, 2003). In practice, banks normally issue Internet banking contracts or agreements with limitation of their liability, noting that the bank is not responsible for any loss caused by the Internet banking service or customer's use of the service (Attaran, 2000). It would be understandable if the customers find a clear definition of liability plausible. Giannakoudi (1999) suggested that customer protection laws have to determine a maximum limit on customers' liability or provide terms widely regarded as unfair to be unenforceable.

Trust, in general, should be of mutual essence. The banks need assurances that the consumers who go online for the purpose of transacting services

online are the consumers who really want to transact and are eligible to conduct the transaction (the registered customers of the bank) and not imposters who are going to embezzle the cash. On the other hand, there are the consumers who would want guarantees that the element of risk in doing a banking transaction over the Internet is minimal and the security level is at its maximum.

Trust is most probably the major element in establishing any organisation's reputation regardless whether it is a bank or a small grocery shop. Being assured by the consumer that this particular bank will have his/her interests at the top of its priority list and will ensure protection to the consumer in any situation that may arise are some of the building blocks of trust. This would probably encourage the consumer to do electronic banking with an established bank with a strong market presence and reputation.

3.5 SUMMARY

This chapter presented a general background of Bahrain and online banking with special emphasis on the issues relating to Bahrain where this research is conducted. Literature indicates that this banking transaction medium is on the rise in spite of the fact that a number of customers are reluctant to let go of their traditional banking methods and use the Internet for sensitive financial transactions.

The next chapter will introduce the research framework employed for this research. It will also highlight the main constructs included in the framework and the reasons for their inclusion. Research questions will be listed and research hypotheses developed in accordance with the proposed research model to help explain the online banking adoption process in Bahrain.

CHAPTER 4

THEORETICAL FRAMEWORK AND HYPOTHESES

4.1 INTRODUCTION

The purpose of this chapter is to build upon the literature review and to present an in-depth discussion about the development of the theoretical model used in this research. The research model is originally based upon the Technology Acceptance Model and the Theory of Planned Behaviour. Both models are combined to present a base model for the research as displayed in Figure 4.1.

The chapter is divided into two main parts. In the first part starting with Section 4.2 of the chapter, a discussion of the pertinent variables will be presented. This will help to provide an explanation of the importance of including these variables in explaining the intention to adopt online banking in Bahrain. The variables presented in the literature and some empirical studies related to these variables will be evaluated. This will be followed with the proposed research model in Section 4.3. In the second part of the chapter starting with Section 4.4, all variables will be incorporated to present the model used for the study. The chapter concludes with a list of the hypotheses proposed by the final model to be tested for the purpose of this research.

As this research will attempt to answer six questions relating to the online banking adoption among the Bahraini customers, a research framework is developed to achieve this objective. Thus, the main purpose of this proposed model is to test whether the Technology Acceptance Model and the Theory of Planned Behaviour are valid in predicting and explaining the following research questions:

1. What are the most influential factors that affect the customers' intention to use online banking as a transaction channel?

2. What are the main characteristics of the users of online banking and what are the main obstacles for further adoption of online banking?

3. Why do some bank customers find online banking unacceptable while others prefer this medium? Which barriers should be eliminated in order to convince the customers of the feasibility of online banking usage?

4. What are the decisive success factors of the Bahraini online banking?

5. Does the collectivist nature of the Bahraini society affect the adoption decision of online banking?

6. Can behavioural intention predict future online banking adoption for the current non-users sample participants?

The framework adopted integrates the Technology Acceptance Model (Davis, 1989) and the Theory of Planned Behaviour (Ajzen, 1985) as a decomposed model with specific constructs related to the online banking environment. Both models were amalgamated and constructs were further decomposed for the purpose of this research. New constructs pertinent to the adoption of online banking in general have been added as well as constructs relating to the culture of Bahrain as an environment for the adoption.

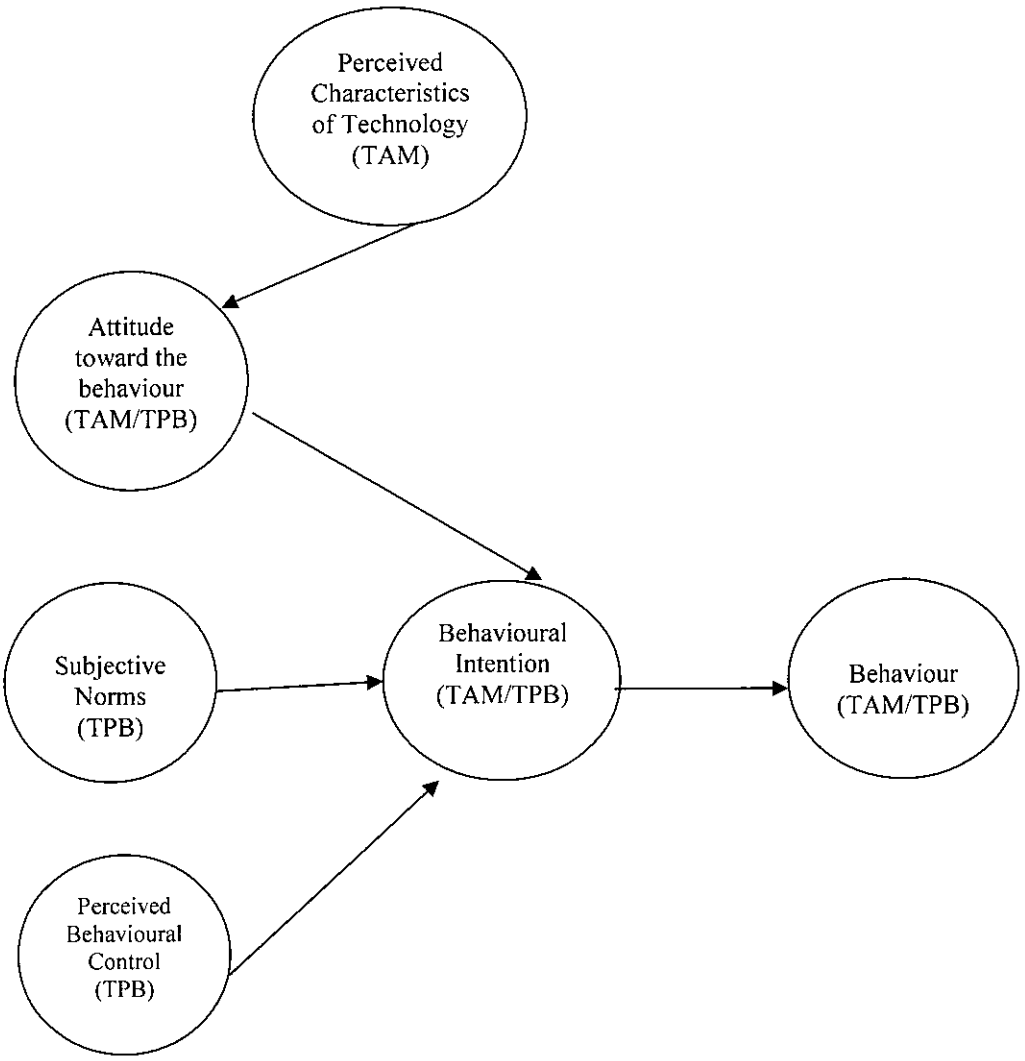


Figure 4.1: **Amalgamated Base Models of the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB)**
Adapted from Ajzen (1985) and Davis (1989)

4.2 KEY MODEL VARIABLES

When online banking was introduced in Bahrain in 1999, it was a kind of novelty which necessitated a wide range of changes to amalgamate comprehensive technology systems to allow for increased automation. It utilises the high-technology service aspect by utilising the Internet, a banking service aspect and a direct electronic banking medium. To be able to measure the acceptance of this banking medium among the Bahraini bank customers, it is important to highlight the key model variables by referring to the previous studies conducted in the field of technology adoption in general and online banking adoption in particular.

In this section, the variables selected for the model will be analysed and with the aid of previous literature and empirical research their use will be validated.

4.2.1 *Individual Differences*

As in the case with any technology adoption, the literature emphasises the importance of paying close attention to the individual differences among customers. Previous studies on Internet banking and adoption behaviours of customers indicate that individual differences help in predicting technology adoption in general and online banking in particular (e.g. Lockett and Litter, 1997; Akinci *et al.*, 2004; Chang, 2004; Kolidinsky *et al.*, 2004). Most studies cited in the literature indicate that highly educated and high income households show a high probability of becoming early adopters of new technologies (e.g. Dickerson and Gentry 1983; Zeithaml and Gilly 1987; Teo, 2001; Swinyard and Smith 2003). The online banking studies also showed that customers who enjoy high education and income levels are more likely to adopt this type of services. Accordingly, individual differences will be included in line with their significance as evidenced in the literature review (Sathye, 1999; Mattila *et al.*, 2003; Branca, 2008; Ozdemir *et al.*, 2008).

Mathieson *et al.* (2001) describe age as a measure of personal resources (or perceived behavioural control). Venkatesh and Morris (2000) as well as Brigman and Cherry (2002) argue that age reduces perceived behavioural control because self-efficacy and cognitive skills decrease as people age. They also argue that age increases the effect of subjective norms because older workers have a greater need for affiliation. Furthermore, the literature suggests that habits can become stronger as one grows older because routines become more difficult to change (Nickel and Pinto, 1986; Majchrzak and Cotton, 1988; Harrison and Rainer, 1992). In general, the paths through habits and behavioural control suggest that age negatively affects usage (Burton-Jones and Hubona, 2006).

Mathieson *et al.* (2001) also argued that education level could be positively associated with perceived behavioural control because it could reflect users' level of internal capabilities, such as technical skills and intelligence. The Theory of Planned Behaviour would then predict that education level should influence usage directly, beyond its effect on perceived ease of use (PEU) and perceived usefulness (PU) (Igbaria *et al.*, 1995; Mathieson *et al.* 2001). Like age, education level should also be associated with self-identity and subjective norms. Nonetheless, if users' conceptions of appropriate information technology (IT) usage change as they receive further education, then education level should directly affect usage behaviour (Sparks and Shepherd, 1992). Users' education level may also influence subjective norms, for example, by creating social expectations that one will use information technology in certain ways (e.g., as an expert user). Overall, the influence of education level on usage via perceived behavioural control would be positive (Mathieson *et al.* 2001). The influence through social norms and self-identity, however, may be positive or negative, depending on the context.

4.2.2. *Culture*

Culture has been selected as an external variable which may affect attitudes due to the importance of introducing technological innovations in different cultures which have been researched in previous studies. Literature has indicated that technology can be viewed as an activity that forms or changes culture (Brogmann, 2006).

In earlier literature it has been found that the degree of masculinity has effects on, for example, ownership of different (luxury) articles which manifests greater success and attracts more members of masculine cultures than members of feminine cultures (De Mooij and Hofstede, 2002). In addition, the adoption of new products or technologies might be an important aspect in exhibiting wealth and success, which may be more compatible with masculine societies (Tellis *et al.*, 2003). Furthermore, it has been found that consumer innovativeness is usually higher in countries whose national culture is characterised by higher levels of masculinity (Steenkamp *et al.*, 1999). Bahrain, being a traditional Middle Eastern society, may exhibit such cultural issues which necessitate further investigation.

4.2.3 *Perceived Technological Characteristics*

The technology adoption literature ascertained the importance of how consumers see the technology presented in terms of ease of use, usefulness, and risk. Studies conducted by Davis (1989) and Davis *et al.*, (1989) confirmed that the perceived usefulness aspect of the technology introduced is usually more strongly relevant to information technology adoption and usage when compared to the perceived ease of use. Individuals may be willing to tolerate a new, complex technology in the hope of gaining an advantage from an information technology adoption perspective (Davis, 1989, p. 1000; Davis *et al.*, 1989, p. 333). Accordingly, it can be inferred that the way an

individual perceives the technology influences the decision making process of technology-based innovation adoption. Taking into consideration online banking and services presented through this medium, the perceived risk, which is associated with this delivery channel, is higher than the regular consumer goods which subsequently increases the importance of this variable, i.e., perceived risk toward the technology (Harrison, 2000, p. 242).

Risk has always been one of the variables that act as an obstacle to adoption of online financial services (e.g. Daniel, 1999; Sathye, 1999; Tan and Teo, 2000; Cox and Dale, 2001; Howcroft *et al.*, 2002). However, in any situation, risk is usually measured and evaluated by weighing the benefits in comparison to costs that might be incurred. Although usually risk has been discussed in the context of negative consequences, Mayer *et al.* (1995, p. 725), argued that "both the possible gains and the potential losses will affect the interpretation of the risk involved". Therefore, perceived risk is considered in this model as it is expected, a result of the evaluation of gains and losses, to influence the adoption behaviour of online banking in Bahrain.

4.2.4 *Attitude*

Attitudes form an important part of the consumer theory and marketing practices because they are felt to be acting as an essential link between what consumers think about products and services and what they buy in the marketplace (Foxall *et al.*, 1998). In general, a person's attitude toward an object has been considered as a good predictor of his/her behavioural intention. The Theory of Planned Behaviour states a mathematical relationship between, attitude, subjective norms, behavioural control and the behavioural intention (Ajzen, 1985). It also states that all beliefs that influence behaviour can affect an individual by shaping his/her attitude, subjective norms and behavioural control toward the relevant behaviour. Attitude is decomposed here by incorporating perceived usefulness, perceived ease of use, and perceived risk as the mediating variables as well as culture

and specific demographics. Previous empirical evidence has shown that perceived ease of use is one of the major cognitive beliefs in determining users' affect (attitude) toward technology adoption (e.g., Davis *et al.,* 1989; Karahanna *et al.,* 1999). In addition, the information technology adoption literature has constantly found that perceived usefulness is the most important determinant of users' adoption intentions (e.g., Davis *et al.*, 1989; Taylor and Todd, 1995; Venkatesh and Davis, 2000). Bhattacherjee (2000) suggested incorporating the Technology Acceptance Model with perceived usefulness and ease of use as the determinants of attitudes toward technology use. In addition Taylor and Todd (1995b) in their decomposed Theory of Planned Behaviour used both components of the Technology Acceptance Model in the attitudinal part of the Theory of Planned Behaviour. However, for this research purpose, the third construct of the attitudinal component has been selected as consumer's perceived risk. According to Information Technology Association of America (ITAA) (2000) three out of five U.S. consumers have indicated that security concerns make them less likely to conduct business online. This type of concern exemplifies Rogers (1995) and Dearing and Meyer (1994) concept of innovation reliability (riskiness) (Eastin, 2002, p. 254). Therefore, perceived risk was added as a third construct to affect the attitude of online banking customers. Culture as a variable specific to the Bahraini adoption environment was added as an additional variable affecting attitudes.

4.2.5 ***Subjective Norms***

Subjective norms are described as the normative beliefs that the behaviour is accepted, encouraged and promoted by a circle of influence (Pavlou and Chai, 2002). The role of subjective norms in system use is not definite (Taylor and Todd, 1995b); however, subjective norms have been widely shown to increase behavioural intentions toward system usage (Karahanna *et al.*, 1999; Venkatesh and Davis 2000). Research dealing with the social construction highlighted the importance of social influence because system adoption is

based on the social climate surrounding the system (Fulk 1993), whereas subjective norms have been associated with compliance with the normative expectations of referent individuals through social pressure. As online banking behaviour is voluntary, the surrounding influence may only have an influence through opinions and suggestions. In other words, consumers may believe that their family, friends, and peers would favour a certain online behaviour.

Although the effect of subjective norms on intention is inconclusive, from prior research there is a significant body of theoretical and empirical evidence regarding the importance of the role of subjective norms on technology use, directly or indirectly, through perceived usefulness in the workplace (e.g., Taylor and Todd, 1995a; Venkatesh and Davis, 2000; Hsu and Lu, 2004). The subjective norms variable have been found to contribute to the prediction of behavioural intention and Compeau and Higgins (1995) argued that the encouragement, which is one source of subjective norms, of others who are important to people can be expected to influence outcome expectations. Accordingly, this variable will be included in the research model and the subsequent effects of it will also be highlighted. Here it is decomposed into two constructs, namely, external influences represented by the media and bank promotion, and interpersonal influences which are represented in this instance by the influence exerted by peers toward the adoption decision. Taylor and Todd (1995b) proposed peer influence and superior's influence as the determinants of the subjective norms. However, for the case of online banking, external influences such as media and bank promotion has been selected to replace superior's influence in the original model. This choice was made on the basis of the rigorous promotional campaigns being adopted by many banks in Bahrain to promote the online banking services to their customers.

4.2.6 *Perceived Behavioural Control*

This variable is decomposed into self efficacy and facilitating conditions represented by sound technological infrastructure, government support and control of the online banking environment. Ajzen's construct of perceived behavioural control refers to beliefs regarding access to the resources and opportunities needed to affect behaviour (Shih and Fang, 2004, p. 217). The decomposition of control beliefs employed here follows directly from Ajzen's (1985, 1991) discussion of the construct. He refers to both, externally based resource constraints and to the internally based concept of 'self efficacy' (Bandura, 1977). This provides two dimensions for control beliefs. The first dimension relates to such factors related to resources particular to the case of online banking such as government support and a sound telecommunication infrastructure. The second dimension relates to the individual's ability and confidence or perceived self-efficacy (Taylor and Todd, 1995b).

The technology involved with online banking is a complex one when compared to the adoption of simple applications;for example, adoption of spreadsheet, word processing, or data base software (Davis *et al.*, 1989; Mathieson, 1991; Vankatesh and Davis, 1996), e-mail and voice mail services (Davis, 1989; Adams *et al.*, 1992; Segars and Grover, 1993; Gefen and Straub, 1997). Accordingly, the argument for adopting the decomposed version of the Theory of Planned Behaviour for this research is the complex nature of the online banking technology which necessitates a thorough investigation of all constructs which may provide a feasible explanation of the adoption intention and usage of this service. In addition, Shih and Fang (2004, p. 220) tested the usefulness of a number of information technology adoption models to online banking adoption in Taiwan including the TPB, both in the original form and the decomposed form, and the Theory of Reasoned Action (TRA). They concluded that both TPB and TRA produce a good fit to the data although "The decomposed TPB model has better

explanatory power for behavioural intention, attitude and subjective norms than the TRA and pure TPB models".

Bahrain Telecommunications Company (BATELCO), which is responsible for providing the technological infrastructure, boasts about being a leader in the Arabian Gulf region in the telecommunications field. Therefore, considering that the infrastructure is sound and available, then Internet commerce applications such as online banking services will be also more feasible (Shih and Fang, 2004). On these bases, it was found necessary to incorporate this construct into the proposed model.

4.2.7 *Intention*

As mentioned in the literature review chapter of this study, the original source of the Theory of Planned Behaviour (TPB), i.e. Theory of Reasoned Action (TRA), states that behaviour (online banking adoption in this case) is best predicted by intentions which are jointly determined by an individual's attitude and the subjective norms related to the behaviour. Attitudes do not influence behaviour in a direct path, but rather they are mediated by behavioural intentions (Lee *et al.*, 2005).

In the case of online transactions, intention can be defined as the consumer's intent to engage in an electronic exchange relationship with a web retailer, such as sharing business information, maintaining business relationships, and conducting business transactions (Zwass, 1998; Pavlou, 2003). Many studies emphasised that a correlation exists between behavioural intention and the actual behaviour (e.g. Taylor and Todd, 1995; Morris and Venkatesh, 2000; Venkatesh and Brown, 2001; Venkatesh *et al.*, 2003). In the case of online banking, the intention to adopt online banking will be one of the variables of the model proposed. However, the predictive correlations between intention and the actual behaviour cited in information systems literature have varied

considerably ranging from -0.23 to 0.79. For example, Davis *et al.* (1989) has found an intent to system usage link of 0.35 while investigating the utility of the TAM model.

4.3 THE RESEARCH MODEL

The model proposed for this study consists of a number of manifest exogenous variables (ease of use,) observed exogenous variables (usefulness, risk, subjective norms, individual differences, external influences, culture), one observed endogenous variable (attitude) as well as self efficacy, and one observed variable (intention). The detailed research model diagram is presented in Figure 4.2.

Although the results of many empirical studies have proven the validity of TAM in both voluntary and mandatory acceptance cases, it has consistently explained only a fraction of usage variance (between 4 percent and 45 percent) in those studies (e.g. Adams *et al.*, 1992; Igbaria *et al.*, 1995; Venkatesh *et al.*, 2003; McFarland and Hamilton, 2004). In addition, there is evidence that the original TAM constructs explain less than 45 percent of intention and usage variance in an e-commerce related context, including behavioural intention (Chen *et al.*, 2002; Suh and Han, 2002). Therefore, it has been recommended to incorporate some other underlying behavioural constructs and external variables reflecting the user's environment in which the technology-based service occur into TAM to solve the problem (Dishaw and Strong, 1999; McFarland and Hamilton, 2004). Accordingly, this research model as indicated earlier relies heavily on Davis's TAM and Ajzen's TPB while being based upon previous theoretical and empirical research in the field of technology adoption. It incorporates both Davis's and Ajzen's models while adding other independent variables (e.g. perceived risk, culture, individual differences, external and internal influences, facilitating conditions and self efficacy).

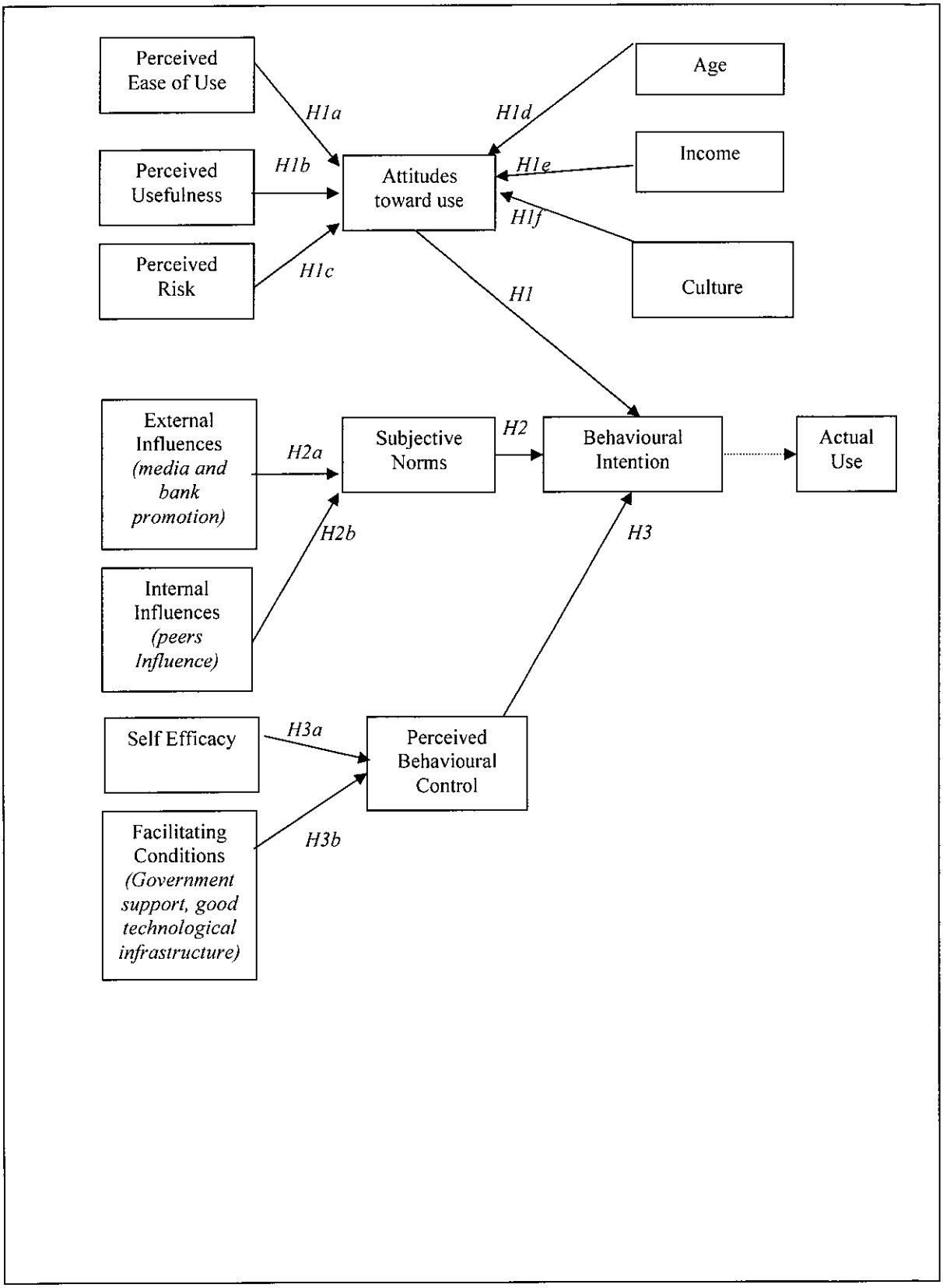


Figure 4.2: **The Research Model**

4.4 HYPOTHESES

In the following section, a description of the hypotheses proposed in this research will be presented. Figure 4.2 displays the structural path of these hypotheses. As shown, the proposed model hypothesises that intention to adopt online banking services is an immediate outcome of a consumer's attitude, subjective norms, and perceived behavioural control toward using the online banking services. Taking into consideration each of these three independent variables in detail, it is proposed that attitude is immediately dependant on the individual differences among customers (such as age and income), perceived ease of use, perceived usefulness, risk and the specific culture of the country. Subjective norms in turn are dependent on the outcome of both external (such as media and bank promotion) and internal (such as those from peers) influences that a customer faces. Perceived behavioural control is affected by both variables, namely self efficacy of the customer and his/her confidence of being able to control the online banking environment in which he/she operates and other facilitating conditions which make this transaction possible such as good telecommunication infrastructure and government support.

4.4.1. *Attitude*

Attitude is defined as an individual's positive or negative feelings (evaluative affect) about performing a specific target behaviour (Fishbein and Ajzen, 1975, p. 216). Attitude plays an important role in inducing different choice behaviour and behavioural intentions (Dabholkar, 1994). The process of attitude formation involves a combination of cognitive beliefs and affective feelings about the attitude object (Zanna and Rempel, 1988). Usually attitude toward a certain object is formed, stored in memory and becomes readily accessible when needed which simplifies the decision-making process as well as improve the quality of the decision making outcome (Fazio, 2000). Furthermore, Parthasarathy *et al.* (1995) argue that it may be possible for an

individual to possess favourable attitudes toward a product yet not have the opportunity or tendency to buy it.

In an online banking context, the attitude is related to the behavioural intention because people form intentions to engage in an online banking transaction toward which they have positive attitudes. In the decomposed version of the Theory of Planned Behaviour and the Technology Acceptance Model, the attitude-behavioural relationship is fundamental (Fishbein and Ajzen 1975; Davis, 1989). Attitude was found to have a significant positive effect on the behavioural intention to use online banking and researchers such as Nor and Pearson (2007) confirmed that a positive evaluation of Internet banking by individuals will lead to their intention to use the technology. This suggests that prior to the acceptance of online banking, the formation of positive attitude about the technology should first take place. The previous argument leads us to the first hypothesis:

H1 *A favourable attitude toward online banking positively influences the consumer's behavioural intention to use online banking services.*

4.4.1.1 Perceived Ease of Use and Perceived Usefulness

In the original multi-attribute attitude model developed from the Theory of Reasoned Action (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980) it suggests that a proximal cause of individual intention is his/her attitude toward an object. Recent studies indicated that when a consumer perceives relative advantages of an innovation compared to the traditional way of conducting business, he/she is more likely to adopt the innovation (Rogers, 1995). Accordingly, it is important to evaluate the consumers' perception of the advantages in the service attributes of online banking and therefore, it is a major determinant of their intention to use the service (Polatoglu and Ekin, 2001).

Davis defined perceived ease of use as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, p. 320). Perceived usefulness was defined as "the degree to which a person believes that using a particular system would enhance his/her job performance (Davis, 1989, p. 320). Several researchers have replicated Davis's original study (Davis, 1989) to provide empirical evidence on the relationships that exist between usefulness, ease of use and system use (Davis *et al.*, 1989; Adams *et al.*, 1992; Hendrickson *et al.*, 1993; Segars and Grover, 1993).

Online banking services allow customers to access their banking accounts from any location at any time of the day and have the ability to check their accounts easily. It provides two major advantages, i.e. convenience (Dobholkar, 1996; Meuter *et al.* 2000; Polatoglu and Ekin, 2001; Karjalouto *et a.l*, 2002; Gerrard and Cunnigham, 2003) and fast service (Kluglak, 1997; Karjaluoto *et al.*, 2002) when compared to conventional banking. Previous studies have found a negative relationship between the degree of the difficulty of the task and usage (Tornatzky and Klein, 1982; Davis *et al.*, 1989; Thompson *et al.*, 1991). In an ordinary situation, the consumer starts using online banking services for simple services (such as keeping track of payments received and conducting simple transactions). When he/she become more familiar with the online banking service, usage of the online service, he/she will move on to using other types of services, and the level of complexity increases according to the user's past experience (Eriksson *et al.*, 2008). Therefore, the above argument leads to propose the existence of a positive relationship between consumers' perceived ease of use and perceived usefulness of the technology-based services and the attitude toward the adoption of those services. The following hypothesise that consumers who perceive ease of use and usefulness as important attributes of online banking are more likely to have the intentions to adopt the service.

H1a *Perceived ease of use positively influences the attitude of the bank customers toward online banking adoption.*

H1b *Perceived usefulness positively influences the attitude of the bank customers toward online banking adoption.*

4.4.1.2 Perceived Risk

This construct is of particular importance to online banking environment and customers as banking in general is a very information sensitive industry. Risk has been formally defined as a combination of uncertainty plus seriousness of outcome involved (Bauer, 1967, p. 196).

Recent research indicated that it was clear that perceived risk plays a negative role in individuals' decisions to adopt new technology including electronic services (e-services) (Hoffman *et al.*, 1999; Jarvenpaa *et al.*, 1999; Walker *et al.*, 2000; Lee *et al.*, 2005) (see Chapter 2). In some cases, risk perception may act as a barrier to a product adoption. Bank customers are often concerned about online banking security, and this concern affects their adoption decisions (Howcroft *et al.*, 2002).

With the increasing number of services and physical products that are being offered over the Internet, consumers are becoming more concerned about security and privacy issues (Pikkarainen *et al.*, 2004). There is a considerable number of consumers who are unwilling to give private information over the telephone or the Internet, such as credit card details (Hoffman and Novak, 1998). Many studies have found that privacy issues represent important barriers to the use of online services (e.g. Westin and Maurici, 1998; Cranor *et al.*, 1999). To begin with, consumers are unwilling to accept that they do not have full control over their own behaviours until they are in a position to master their own acts and to know the causes and consequences of their own and others' acts (Baronas and Louis, 1988). Online users want to control what kind of data is collected, for what purposes, how long data is recorded for, how and for what purposes their data is processed (Kobsa, 2001; Kobsa,

2002). Gathering and recording user data without consumers' awareness represent a major concern for them (DePallo, 2000).

Perceived risk is considered a significant aspect that has considerable effect on the consumer decision-making process when buying products or consuming some services (Mitchell, 1998). Due to the nature of online banking and because it is a technology-enabled channel, consumers perceive the use of online banking as a risky decision because technology-enabled services exhibit pervasive technological, unfamiliar and ambiguous stimuli (Davidow, 1986). Therefore, when consumers decide to use online banking, they are exposed to uncertainties such as the availability, the compatibility, and the performance of the complementary online banking channels (Sarin *et al.*, 2003). Ho and Ng (1994) and Lockett and Littler (1997) empirically supported the notion that the use of electronic banking involves risk. Ho and Ng (1994) suggested that consumers perceived an element of risk was present with using online banking while Lockett and Littler (1997) identified risk as an important characteristic of electronic banking. These include financial risk, performance risk, physical risk, social risk and psychological risk (Gan, *et al.*, 2006).

In general, perceived risk has received considerable attention in adoption research (e.g. Suganthi and Balachandran, 2001; Jaruwachirathanakul and Fink, 2005; Wan *et al.*, 2005; McKechnie *et al.*, 2006). The importance of security and privacy to the acceptance of online banking has been noted in many banking studies (Roboff and Charles, 1998; Sathye, 1999; Hamlet and Strube, 2000; Tan and Teo, 2000; Polatoglu and Ekin, 2001; Black *et al.*, 2002; Giglio, 2002; Howcroft *et al.*, 2002). For example, privacy and security were found to be significant obstacles to the adoption of online banking in Australia (Sathye, 1999). On the other hand, Roboff and Charles (1998) found that people have a weak understanding of online banking security risks although they are aware of the risks. They also found that consumers often rely on their bank to take up the role of being more concerned about privacy

issues and protect them. Finally, they argue that although consumers' confidence in their bank was strong, their confidence in technology was weak (Howcroft *et al.*, 2002).

When considering online banking, the utility gains of potential increased efficiency, cost savings, and fiscal control become overshadowed with perceived risk and uncertainty of the Internet as an unsecured communication medium (Featherman and Pavlou, 2002, p. 1035). The fact that there is no personal face-to-face contact with online banking can increase the customers' risk perceptions particularly with the added hazard of potential financial loss risks and perceived threats to privacy (Milne and Boza, 1999). Accordingly, the following hypothesis is investigated:

H1c Perceived risk negatively influences the attitude of the bank customers toward online banking.

4.4.1.3 Individual Differences

Research on consumer attitude and the adoption of online banking indicates the existence of several factors which contribute to the formation of a consumer's attitude toward online banking of which an individual's demographic characteristics play significant roles in the process of adoption (e.g. Howcroft, *et al.*, 2002). For example, Karjaluoto *et al.* (2002) found a typical user of online banking in Finland to be highly educated, relatively young and wealthy with a good knowledge of computers and especially the Internet. The results of their study proposed that demographic factors have an impact on online banking behaviour. These findings are in agreement with earlier research (e.g. Daniel, 1999; Sathye, 1999). In addition, research has also shown that consumer resources influence the use of electronic banking. Mols (1998), Sathye (1999) and Karjaluoto *et al.* (2002) studies showed that some consumers lacked access to a personal computer (PC) which prohibited the adoption of electronic banking. Studies also indicated that innovation

adopters have higher levels of income, education, and are usually younger and have more favorable attitudes toward risk (Dickerson and Gentry, 1983; Gatignon and Robertson, 1991; Rogers, 1995).

Agarwal and Prasad (1999) argued that the user's capabilities are usually a result of demographics (user's age, educational background, income) or situational (experience with computers, training) differences. With advances in retail innovations, age has been found to be of significance in the adoption decision making process and the technology innovation literature suggests an inverse relationship between age and the acceptance of new technologies (e.g., Nickel and Pinto, 1986; Harrison and Rainer, 1992). Older customers are more conditioned to their traditional way of behaving which suggests that older individuals have to exert more cognitive and emotional effort to learn new behaviours and distance themselves from their daily routines (Crisp *et al.*, 1997). Zeithaml and Gilly (1987) found that elderly people who did not accept the idea of using bank automated teller machines (ATMs) emphasised their appreciation of social interaction. In addition, those with less education have been found to exhibit more computer anxiety and more negative attitudes toward computers (Igbaria and Parasuraman, 1989).

In the field of online banking, research has highlighted specific characteristics such as that adopters are usually married men with better education and high level income and profession (Sathye, 1999; Polatoglu and Ekin, 2001; Suganthi and Balachandran, 2001; Karjaluoto *et al.*, 2002; Matilla *et al.*, 2003; Akinci *et al.*, 2004; Eriksson *et al.*, 2005; Jaruwachirathanakul and Fink, 2005; Laforet and Li, 2005; Wan *et al.*, 2005). Mattilia *et al.* (2003) found that household income and education predicted whether or not consumers in Finland adopted Internet banking, and Sathye (1999) indicated that young, educated, and wealthy consumers were among those most likely to adopt to Internet banking in Australia. Although some research indicates that demographic influences are weak (Ostlundt, 1974), consumer innovators are generally thought to have higher levels of income and education, and are

younger (Im *et al.*, 2003). Therefore, the following hypothesis is investigated in line with the importance of individual differences in shaping the attitudes of customers toward online banking.

H1d *Age of customers will negatively influence the attitude of bank customers toward online banking adoption.*

H1e *Income of customers will have a significant positive influence on the attitude of bank customers toward online banking adoption.*

4.4.1.4 Culture

According to Honold (2000), culture does not determine the behaviour of the individuals but it does point to probable modes of perception, thought, and action.

Culture makes a difference to the consumer's behaviour and subsequently has an impact on bank marketing. Hofstede's (1991) "value system" of national cultures has some relevance in the context of Bahrain and can help in understanding the consumer's behaviour toward new technology-based financial services channels, such as online banking. However, despite the national culture and subculture, there are always some individuals who are more inclined to adopt new ways of thinking and behaving than others (Laforet and Li, 2005).

Hofstede (2001) introduced a cultural framework consisting of four dimensions: individualism-collectivism, power distance, uncertainty avoidance, and masculinity-femininity. Of the four dimensions that comprise Hofstede's cultural framework, uncertainty avoidance and individualism-collectivism are the two variables that have been determined relevant to the study of consumers' usage of innovations in different cultures (Van Everdingen and Waarts, 2003; Lim *et al.*, 2004; Park and Jun, 2003). In addition, Yeniyurt and Townsend (2003), argued that people in individualistic

cultures often see themselves as independent persons, separate from others who have no influence on their decision making process. They also indicated that people tend to place greater importance on their own and their immediate family's well-being in individualistic cultures, whereas in collectivistic cultures, people feel they belong to a group, whose well-being comes before the needs of the individual.

Steenkamp *et al.* (1999) emphasised that consumer innovativeness involves a tendency to shape a new behaviour, independently of others. This behaviour is valued positively in individualistic cultures, but negatively in collectivistic cultures. Consumers living in cultures with a high level of uncertainty avoidance are conditioned to have the tendency to be resistant to change from routine and are focused on risk avoidance and reduction. Because innovations and new products are considered to carry a considerable degree of risk, consumers' performance and use are more ambiguous than established products (Steenkamp *et al.*, 1999). Research has found that uncertainty avoidance has a negative influence on consumer innovativeness (Yeniyurt and Townsend, 2003). Park and Jun (2003) have shown that cultures with high levels of uncertainty avoidance are less likely to be early adopters of innovation. In addition, Lim *et al.* (2004), indicated that Hofstede's individualism-collectivism dimension affects the way people build trust, and uncertainty avoidance affects the willingness of people to accept uncertainty. Therefore, as conducting business online represents a new experience for most people and are carried out in a virtual environment without the physical assurance of traditional service experiences, uncertainty is part of this activity. To sum up the above argument, cultures with a high degree of individualism are more eager to adopt innovations while individuals from collectivist cultures with a high level of uncertainty avoidance hesitate to commit to innovations (Steenkamp *et al.*, 1999; Van Everdingen and Waarts, 2003; Yeniyurt and Townsend, 2003; Bagchi *et al.*, 2004).

The Arabic culture is high on both dimensions of collectivism and power distance, and low on future orientation (Kabasakal and Bodur, 2002; Yasin, 1996). The above argument makes it important to include culture as an influencing construct and present the following hypothesis:

H1f *Culture of the bank customer has significant influence on the attitudes toward the use of online banking in terms of collectivity and status seeking.*

4.4.2 ***Subjective Norms***

Subjective norms refer to "the person's perceptions that most people who are important to him think he should or should not perform the behaviour in question" (Fishbein and Ajzen, 1975, p. 302). It is related to intention because people often act based on their perceptions of what others think they should do. In terms of online banking services, the consumer-relevant groups around the individual may influence the individual adoption (Tan and Teo, 2000). It is expected that the influence of these groups as a whole will be significantly related to the individual's intention to adopt online banking.

When it comes to an innovation, subjective norms are likely to become more recognised and of significant influence during the later stages of the life-cycles when the primary adoption influence is interpersonal in nature (Parthasarathy *et al.*, 1995). There is evidence in literature for the argument that consumers who are highly reliant on normative influence will be late to adopt (Burt, 1973; Gatignon and Robertson, 1985). However, when the individual directly interacts and experiments with the technology, then his/her decisions are more influenced by his/her own experiences rather than by the views of others (Hartwick and Barki,1994; Taylor and Todd,1995a; Tan and Teo, 2000). In addition, the culture of the online banking customer should also be examined to determine the extent and complexity of interpersonal networks, and the extent of normative influence that exists within the society.

Collective, high context societies usually possess a better developed interpersonal network which makes adoption decisions based more on subjective normative influences than individualistic, low context societies as found by Parthasarathy *et al.*, 1995. Therefore, the following hypothesis warrants investigation.

H2 *Subjective norms positively influence consumers' intention to use online banking services.*

4.4.2.1 External Influences and Interpersonal Influences

Rogers (1995) described communication channels as being classified either as mass-media or interpersonal, and that in general, interpersonal communication channels are more efficient for the development of perceptions about the innovation. In a study of electronic brokerage services adoption, Bhattacherjee (2000) found that the subjective norms variable was an important predictor of the users' initial intention to accept these services. He viewed the subjective norms variable as a collective component including two distinct types of influence, namely, interpersonal and external. His definition of external influence and interpersonal influence is as: "external influence refers to mass media reports, expert opinions, and other *non-personal* information considered by adopters in making a "rational" acceptance decision, while interpersonal influence refers to word-of-mouth influence by friends, colleagues, superiors, and other prior adopters known to the potential adopters" (Bhattacherjee, 2000, P. 412).

In both the Theory of Reasoned Action and the Theory of Planned Behaviour, the subjective norms variable directly influences behavioural intentions (Ajzen, 1991, 2001). Fishbein and Ajzen (1975) noted that subjective norms refer to the perceptions of the preferences of significant others regarding the worth of engaging in a specific behaviour. Furthermore, Ajzen (1991) also proposed that subjective norms reflect an individual's perceptions of social

pressure regarding whether or not to perform a particular behaviour. The above two viewpoints clearly emphasise that the determinants of the subjective norms include not only the preferences of significant others, but also other social factors represented by the social pressure exerted on the customer. Accordingly, an important feature of social and personality psychology is to divide the determinants of social behaviour into personal attributes and social environment attributes (Ku and Chang, 2003). Taylor and Todd (1995a) when attempting to examine the application of the Theory of Planned Behaviour to information technology acceptance, they preferred only to take personal influence (normative belief) as a determinant of the subjective norms variable. However, others such as Bhattacherjee (2000) preferred to maintain both personal and external environmental influences as equally important determinants of subjective norms. In addition, Karahanna *et al.* (1999) noted that social influence can be divided into informational and normative influences. The informational influence is described as individuals accepting information as evidence of reality, while normative influence is described as individuals complying with the expectations of various significant others (Hung *et al.*, 2003).

The above argument makes it important to include both external and internal influences as two significant constructs and present the following hypotheses:

H2a *External influences such as bank promotion and media positively influence subjective norms.*

H2b *Internal influences such as those from peers positively influence subjective norms.*

4.4.3 ***Perceived Behavioural Control***

The definition of perceived behavioural control deals with the factors that may impede the performance of the behaviour. A number of empirical studies

have found a relationship between this construct and intention (e.g. Ajzen, 1991; Madden *et al.*, 1992).

Perceived behavioural control deals with one's perceptions of the availability of resources or opportunities necessary for performing a behaviour (Ajzen and Madden, 1986). This variable has received considerable attention as a significant predictor of intention (e.g., Manstead and van Eekelen, 1998; Armitage *et al.*, 1999). Perceived behavioural control has also been expanded to the studies of continuing intention for information technology adoption. For example, Taylor and Todd (1995b) suggested that the perceived behavioural control had a stronger effect on the behavioural intention for the experienced users who are quite proficient with technology while Venkatesh *et al.* (2003) found that perceived behaviour control had a significant effect on behavioural intention after the training stage with dwindling effect after the actual usage of the technology.

Therefore, perceived behavioural control shows individual perceptions of internal and external behavioural limitations (Ajzen, 1991). The internal constraints require a higher level of self-efficacy to successfully perform a given behaviour and it represents the person's perceived behavioural control in the behaviour (Ku and Chang, 2003). On the other hand, individual perceptions of external behavioural constraints influence perceived behavioural control (Huang, *et al.*, 2003). Both external and internal perceptions directly contribute in shaping a person's perception of his/her control and confidence in conducting the technology-based transaction on hand. Therefore, the following hypothesis warrants investigation:

H3 *Perceived behavioural control over an online banking transaction positively influences the consumer's intention to use online banking services.*

4.4.3.1 Self Efficacy

This first component of perceived behavioural control deals with the individual's confidence in his/her ability to perform a certain behaviour (Bandura, 1982). Other researchers such as Compeau and Higgins, (1995) defined computer self-efficacy as the judgment of a person's ability to use computers. Earlier studies have found that there is a positive relationship between a person's experience with computing technology, perceived outcome and the actual usage (Agarwal and Prasad, 1999). Computer self efficacy construct has been examined in the information systems literature (Compeau and Higgins, 1995; Compeau *et al.*, 1999; Agarwal *et al.*, 2000; Johnson and Marakas, 2000; Hong *et al.*, 2001). These studies confirm the important effect of computer self efficacy in understanding individual responses to information technology. The proposed relationship between computer self efficacy and perceptions is based on the theoretical argument of Davis *et al.* (1989) and Mathieson (1991). Chan and Lu (2004) have found that users of online banking services need to have the necessary knowledge to operate a computer and use the Internet, and therefore, computer self efficacy helps to explain the adoption and rejection decisions on the part of the users. Accordingly, an individual who is confident in having the skills to use the computer and the Internet is more likely to adopt online banking. The main reason for the readiness of the individual to adopt this service is being comfortable in using this technology. The above argument leads to the following hypothesis:

H3a Self efficacy positively influences perceived behavioural control.

4.4.3.2 Facilitating Conditions

The second component of perceived behavioural control refers to the easy access of technological resources and infrastructure. Researchers identified three factors that affect the perceived behavioural control of the customer:

his/her confidence in performing the behaviour, facilitating conditions such as the availability of the resources needed to carry out the behaviour, and the ease of use of the technological innovation (Benham and Raymond 1996; Tan and Teo, 2000). Those facilitating conditions refer to objective factors in the environment that make an act easy to perform (Cheung *et al.*, 2000).

In terms of utilising the Internet to conduct any kind of transaction, this would refer to technological resources and infrastructure that are available. Facilitating conditions, or their absence, have been empirically found to be significantly related to information technology adoption decisions (e.g. Jiang *et al.*, 2000). For example, Taylor and Todd (1995a) found that individual perceived facilitating resources, such as time and money, influence perceived behavioural control toward technology-based services adoption. In another empirical study on acceptance of electronic commerce services, Bhattacherjee (2000) found that facilitating resources were an important predictor of perceived behavioural control.

In Bahrain, the local government represented by the Central Bank of Bahrain (CBB) acts as a regulating body of all banking and financial transactions with the help of the Ministry of Commerce. In addition, the Bahrain Telecommunication company BATELCO is a driving force in the diffusion of telecommunication technologies on the island. This would encourage potential customers to look favourably upon electronic services such as online banking and hence be more willing to use them. While facilitating condition refers to the easy access of technological resources and infrastructure to the public to enhance the adoption of online banking, the government support element of this variable is consistent with the national systems of innovation theory that posits that government policies may encourage or mandate technology development and adoption (King *et al.*, 1994; Wolcott *et al.*, 2001). Accordingly, and following Tan and Teo (2000), facilitating conditions variable was broken down in this research into technological support provided by BATELCO and government support represented by rules

and regulations set by the Central Bank of Bahrain as independent variables. Therefore, the following hypothesis is warranted:

H3b *Facilitating conditions positively influence perceived behavioural control.*

4.5 SUMMARY

The theoretical model used throughout this study utilised both the Theory of Planned Behaviour and the Technology Acceptance Model constructs combined. In addition to these constructs, external and internal variables were added to help explain the adoption of online banking services in Bahrain such as demographic variables, culture, risk perception, interpersonal and external influences, self efficacy and facilitating conditions.

Table 4.1 summarises the hypotheses proposed in relation to the study model and their role in answering the research questions of the study. Those hypotheses will attempt to explain the attitudes and behaviour of the online banking customers in Bahrain in relation to their internal and external perceptions and beliefs.

In the next chapter, the research method used for the collection of the data for this study will be explained. Different analysis tools will be listed with justification for the choice of those particular instruments to help analyse the data collected from respondents.

Table 4.1: **Hypotheses and Research Questions Grid**

Hypothesis	**Variables**	**Research Questions**					
	ATTITUDE	Q1	Q2	Q3	Q4	Q5	Q6*
H1	A → BI	✓		✓	✓		
H1a	PEU → A		✓	✓			
H1b	PU → A		✓	✓			
H1c	PR → A		✓	✓			
H1d	AGE → A		✓				
H1e	INC → A		✓				
H1f	CUL →A		✓			✓	
	SUBJECTIVE NORM						
H2	SN → BI	✓		✓	✓		
H2a	EX → SN		✓				
H2b	INTI → SN		✓			✓	
	PERCEIVED BEHAVIOURAL CONTROL						
H3	PBC → BI	✓		✓	✓		
H3a	SE → PBC		✓				
H3b	FC → PBC		✓				

* Question 6 will be answered by using binary logistic regression (see Chapter 7)

Legend:

AGE = Age Group
ATT = Attitude
BI = Behavioural Intention
CUL = Culture
EXTI = External Influences
FC = Facilitating Conditions
INC = Income
INTI = Internal Influences
PBC = Perceived Behavioural Control
PEU = Perceived Ease of Use
PU = Perceived Usefulness
SE = Self Efficacy
SN = Subjective Norms

CHAPTER 5

RESEARCH METHODOLOGY AND METHODS

5.1 INTRODUCTION

This chapter describes the research methodology and methods that were used for conducting this research. The Chapter is divided into five sections. The first section highlights the various research philosophies and the philosophy chosen for this study. This is followed by an outline of the study design in the second section of the chapter. The third section describes the instruments development, survey pilot tests and survey administration procedures. The fourth section contains a description of the sample and the data collection procedures while the last section presents the statistical methods which were employed to analyse the data.

5.2 STUDY PHILOSOPHY

The research design provides the opportunity for "building, revising and choreographing" (Miles and Huberman 1994, p. 16) the overall research study. It is defined by Easterby-Smith, *et al.,* 1991, p. 21, as the "overall configuration of a piece of research".

However, the choice of a particular research methodology is influenced by several factors (Bryman 1989; Easterby-Smith *et al.,* 1991). Those factors consist of the type of the research questions (such as "what," "how," "who," "why,"), each of which requires different research designs to adequately answer them (Yin 1994); the nature of the phenomenon under study, (Eisenhardt 1989); the extent of control required over behavioural events in

the research context (Yin 1994); and the researcher's philosophical stance. The last factor refers to how the researcher understands the nature of social reality and how knowledge of that reality can be gained (Tsoukas 1989; Blaikie 1993).

The research methods are usually approached and analysed at different levels starting with the basic level which covers the philosophy adopted for the research (Clarke, 1998). According to Pilot *et al.* (2001) the methodological differences most frequently cited lie in the distinctions between the philosophical traditions of positivism which is associated with the quantitative research and the post positivist philosophy represented by the qualitative research approach.

The basis for research paradigms are methodology, epistomogly and ontology (Guba and Lincoln 1994; Neuman, 2003). Ontology deals with what exists and the nature of the world while epistemology is a theory of knowing and how we acquire knowledge of the external reality (Neuman, 2003). In technology research, Mingers and Gill (1997) summarise the two acceptable epistemologies that are valid when conducting research, namely positive, and interpretive as follows:

1. Hard (positivist) which treats the organisational world as objective and the same as the natural world; and
2. Soft (interpretivist) which treats human organisations as fundamentally different, based on subjective meaning and interpretation.

The above two major philosophical approaches will be briefly discussed in the next section with reasons for the choice of the particular research philosophy adopted in this research.

5.2.1 *Positivist Approach*

The positivist school of thought assumes that things can be studied as hard facts and the relationship between these facts can be established as scientific laws (Smith 1998). The basic reasoning of positivism assumes that an objective reality exists which is independent of human behaviour and is therefore not a creation of the human mind (Crossan, 2003).

According to Martin and Richards (1995) nature is assumed to hold a unique truth and the current position of scientific knowledge is believed to be the best available estimate to that truth. There is no need to examine why scientists believe what they believe, because there are assumed to be no social factors intervening between nature and the scientific truth. Those who contradict these revelations of nature are treated differently and it is assumed that there must be some social explanation for their particular behaviour (Martin and Richards, 1995).

Researchers following the positivism paradigm approach the problem solving of the issue at hand by formulating hypotheses that are subjected to empirical testing through quantitative methods (Buttery, 1991). Those methods help establish an objective, value free and clear interpretation of the reality (Guba and Lincoln, 1994).

5.2.2 *Interpretivist Approach*

This approach stands on the other extreme end of view to the problem at hand as it is subjective in nature and interpretivists "contend that only through the subjective interpretation and intervention in reality can that reality be fully understood" (Davidson, 1998, p.3). Interpretivists believe that reality is not objectively determined, but is socially constructed (Husserl, 1965). The fundamental assumption is that by the right placement of people in their social

contexts, there is greater opportunity to understand the perceptions they have of their own activities (Hussey and Hussey, 1997). By its nature, interpretivism promotes the value of qualitative data in pursuit of knowledge (Kaplan and Maxwell, 1994). In essence, this research paradigm is concerned with the individuality of a particular problem or situation which contributes to the underlying pursuit of contextual depth (Myers, 1997).

The following table summarises the main differences between the positivist and the interpretivist paradigms.

Table 5.1: **Features of Two Research Paradigms**
Source: Hussey and Hussey 1997, p. 312

Positivist Paradigm	Interpretivist Paradigm
Uses large sample size	Uses small sample size
Researcher does not get involved into problem domain	Researcher gets involved
The location is artificial	The location is natural
Data is specific and more precise	Data is subjective
Concerned with testing hypothesis	Concerned with developing theories
Generalises from sample to population	Generalises from one setting to another

5.2.3 *Research Philosophy Adopted*

The underlying epistemology guiding electronic business research falls broadly into the positivist and interpretivist paradigms (Myers 1994; Clarke 2000). This research studies online banking in Bahrain from a positivist perspective as it is consistent with the nature of the topic. In addition, according to Saunders *et al.* (1997), this approach is preferred because it allows economical collection of data; clear theoretical focus of the research; control of the research by the research; and provides easily comparable data.

In addition, this research intends to explore and build a new model of online banking adoption through answering the research questions stated in Chapter

One for which a survey is more likely to produce answers to these questions. The issue of thoroughness provided by the positivist perspective is relevant for this research to ensure that the study generates findings which are sound, adequate, and able to be evaluated according to accepted standards.

Therefore, this research falls within the positivistic paradigm rather than interpretivistic paradigm as it intends to investigate the current situation regarding the adoption of online banking in Bahrain. Hypotheses are formulated as an outcome of a thorough investigation of the literature in the field. These hypotheses will be tested by using data collected for a questionnaire using constructs applied in earlier studies. Accordingly, the factors that influence the adoption and usage of online banking in Bahrain will be highlighted by identifying the relationships between the variables and will be related to the two technology adoption theories employed in the research model, the researcher remains detached from the problem realm (Hussey and Hussey, 1997). In addition, the researcher studies online banking as an observer of the situation and remains neutral throughout the research. Therefore, the above argument qualifies this research to be taking a positivistic approach to the study of online banking in Bahrain.

5.3 STUDY DESIGN

The main objective in this research is to empirically examine a range of factors that are most likely to influence the usage and behavioural intention to use online banking in Bahrain. With this understanding, banks can make decisions to control these factors in order to increase prospective users' intention to use this service (Jackson *et al.*, 1997). To attain this goal, this research investigates the consumers' intentions to adopt online banking on the basis of the model presented in Chapter 4. The studies of adoption of information technology can take any of three possible approaches:

1. Diffusion Approach (Rogers, 1995). This approach describes the aggregate acceptance process as a function of time that may be used to categorise adopters of different kinds (Mahajan *et al.*, 1990). Pedersen (2003) stated that this type of research has its foundation in marketing and economics and studies the aggregate diffusion or adoption of a technology or services in an industry.

2. Adoption Approach. This approach has its foundation in information systems research and it describes and explains the acceptance decision of individual users applying different social theories of decision-making. Three models collectively called the Technology Adoption Theories (TAT) stand out as the most widely applied explanation within the adoption approach, namely, the Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB) (Pedersen, 2003; Vijay *et al.*, 2005).

3. Domestication Approach. This approach has its foundation in sociology and it often employs a qualitative study of the acceptance of technology and the main focus is on the societal consequences of the domestication of technology (Silverstone and Hirsch, 1992; Bergman and van Zoonen, 1999; Haddon, 1999; Pedersen, 2003).

According to Vijay *et al.* (2005) the adoption approach outlined by the Technology Adoption Theories (TAT) appears to be the most comprehensive in explaining perception and acceptance of technology. As this is the main purpose of this research, the adoption approach is being used to investigate the acceptance of online banking in Bahrain.

In addition, there are two general approaches to be used when testing various factors and activities that lead to the development of an effective information

system such as online banking which can be summarised as follows (Chaiken and Stangor, 1987; Jackson *et al.,* 1997):

(a) Factor studies which use cross-sectional data, and they are concerned with the ways that cognitions about a behaviour are combined to create either attitude, intentions or both, toward the behaviours; and

(b) Process studies which use longitudinal data and are concerned with the underlying cognitive processes that influence the attitude-behaviour relationship.

Due to the nature of this research, the method that is followed is a cross-sectional cognitive factor approach to test the behavioural model proposed. A comprehensive model was posited in the previous chapter that described the relationships among user perceptions, beliefs, psychological constructs and the behavioural intention to use the online banking system in Bahrain. The basis for the model is derived from previous research on technology adoption models (see Chapter 2).

Furthermore, there are generally two research methods for tackling any problem in research, qualitative methods and quantitative methods. These two methods give different results that are appropriate for different problems and situations. The qualitative method is more interested in the individual (Janesick, 1994). Instead of asking what an objective reality looks like it asks the individuals to translate their perceptions and understandings of the problem on hand and promotes the expression of their own feelings and reality.

On the other hand, quantitative methods use measurement, quantified by mathematics and statistics. They are the result of a numerical observation on which the researcher normally performs a statistical analysis. Questions like

how much, how many and how often are usually used in quantitative methods (Gottling and Torgnysdotter, 2002).

The research on hand employs a quantitative, cross-sectional and non-experimental design. A questionnaire was used as a data collection instrument to measure how the intention to adopt online banking services is influenced by personal characteristics (income and age), perceptual variables (perceived ease of use, perceived usefulness and perceived risk) as well as national culture, attitude toward adoption of online banking, subjective norms toward adoption of online banking with both external and interpersonal influences affecting these norms and perceived behavioural control toward adoption of online banking services with facilitating conditions and self efficacy as independent variables affecting it.

5.4 QUESTIONNAIRE DESIGN

A questionnaire was employed for the purpose of this study. As the population of the research is all banking services users in Bahrain with an Internet connection, the questionnaire was employed to define the factors that shape the consumer's intention and lead them to go online and transact. (A copy of the questionnaire is presented in Appendix 2).

The questionnaire uses mainly a uni-dimensional 7-point Likert scale to collect the data for the constructs of the research model from the participants. Items from previous studies were modified for adaptation to the Internet banking context. The measures of actual use, behavioural intention to use, attitude toward usage, subjective norms, and perceived behavioural control were adopted from various studies related to the TAM and TPB (Taylor and Todd, 1995b). Six decomposed beliefs, namely perceived usefulness, perceived ease of use, external influences, interpersonal influences, self efficacy and facilitating conditions were adapted from Taylor and Todd

(1995b), Buttacherjee (2000) and Pedersen (2005). Other constructs represented by perceived risk and culture are included for the purpose of this research and the area being investigated. Individual characteristics are also added as a construct to influence technology adoption as confirmed by information technology adoption literature (see Chapter 2). The concepts were measured by the respondents rating a set of statements using a 7-point scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (7).

5.4.1 *Questionnaire Generation*

With regard to the independent variables that are proposed to affect attitude, the questions were derived to measure the perceived usefulness and perceived ease of use constructs from Davis's TAM model (Davis, 1989) and to measure the perceived risk constructs from the earlier research on perceived risk.

Measurement of perceived ease of use construct stresses how comfortable consumers will be with online banking as a transaction medium. For the measurement of the perceived usefulness construct, the influence of online banking on the consumers is emphasised in terms of benefits gained through usage. In order to measure the perceived risk construct, there is a need to focus on the risk factors regarding the services that discourage consumers from doing online banking transactions in addition to the security and privacy of transactions conducted on the Internet.

Culture is also included as another independent variable which is being investigated whether it has a significant influence on shaping the attitudes of the bank customers toward online banking adoption.

Individual characteristics are also considered as literature provided empirical evidence that young, affluent and highly educated individuals generally

accept changes more readily which is favourable in the case of online banking adoption (see Chapter 2).

The same procedure was carried out when selecting questions related to the other variables being tested in the proposed model. Previous research cited in the literature review chapter was the main generator of the variables and subsequently the relevant questions included in the final version of the questionnaire.

5.4.2 *Order of Questions*

For any survey, the sequencing of questions is of vital importance. Questionnaires should appear logical and carefully thought with earlier questions should attempt to create interest in the respondent (Proctor, 2005, p. 201). Many researchers emphasise the importance of starting any questionnaire with simple and direct questions which will encourage the respondents to continue (e.g., Salant and Dillman, 1994).

The first section of the questionnaire asked general questions about Internet usage and frequency. These questions were direct and easy to respond to.

In the second part questions related to online banking facilities of the customer's banking service provider. The third section is dedicated to measure the attitude of customers toward online banking in general.

A series of questions relating to the various elements that made up the various perceptual constructs of the model were listed in section four of the questionnaire. All items in this section used Likert scale rating questions and were grouped together. Radburn (1982) argues that carryover effects may occur when following this practice and subsequently may inflate the reliability score, but Davis and Venkatesh (1996) conducted three separate

experiments to measure biases in the Technology Acceptance Model and failed to uncover any significant effects of item groupings.

Respondents were invited to provide their feedback and input about online banking services in Bahrain in section five of the questionnaire with a couple of open-ended questions. Some choices were presented in addition to some open space for any extra comments.

The last section of the questionnaire included personal data questions, which were simple and straightforward such as age, gender, marital status, income, and education.

5.4.3 *Pilot Test 1*

The questionnaire was distributed to a convenience sample of ten University of Bahrain academic staff members at the College of Business and Administration. Out of the 10 questionnaires distributed, 8 completed questionnaires were returned during the first pilot testing stage.

Feedback on the questionnaire included several changes that were made to the original copy. Changes included simplifying the language of the questions in an attempt to make it easier to comprehend by the diversity of the population who would ultimately respond to the questionnaires.

5.4.4 *Pilot Test 2*

A second pilot test was conducted on another convenience sample of 20 participants with diversified backgrounds and personal characteristics. Candidates for the second pilot test were a mixture of students (3), secretaries (2), heads of departments at two private companies and one ministry (3), accountant (1), office workers (4), retired worker (1), engineers (3) and

academics (3). Eighteen questionnaires were returned completed in the second pilot test.

Changes as a result of the feedback of the participants included layout suggestions, and the need for translating the questionnaire into Arabic to ensure that it could be understood by all groups of participants.

5.4.5 *Translation of Questionnaire*

As a result of the second pilot test, a copy of the questionnaire was translated into Arabic by the researcher. A translated copy was given to a dual language speaking instructor of English as a foreign language and was requested to translate it back into English. This step was taken to ensure that the Arabic language translation would result in the original English language questionnaire version. Accordingly, some linguistic changes were made to the Arabic version of the questionnaire to make it compatible with the English language version.

The newly translated version of the questionnaire was again pilot tested to 5 participants who agreed on the final version of the questionnaire. Copies of both questionnaires are provided in Appendix (2) together with a dual language cover letter explaining the purpose of the questionnaire.

5.4.6 *Pilot Test Reliability*

Internal consistency reliability, also called reliability of components, looks at the extent to which the items used to assess a construct reflect a true common score for the construct (Park *et al.*, 2004). Cronbach (1951) defined reliability as an assessment of the extent to which respondents can answer similar questions the same way each time. Conducting a second pilot test was one method employed to evaluate the reliability of the questionnaire. Another

method used was to carry out Cronbach alpha test to measure the internal consistency of the measurement scale used on the responses to the second pilot test. The following table displays the reliability coefficients of the variables used.

Table 5.1: **Reliability Coefficients of Variables**

Variable	Number of Questions	Standardised Item Alpha
Attitude	4	.978
Subjective Norms	3	.923
Perceived Behavioural Control	3	.839
Perceived Ease of Use	5	.640
Perceived Usefulness	4	.891
Self Efficacy	5	.938
Risk	5	.769
Social Influences	2	.613
External Influences	6	.637
Culture	3	.616
Facilitating Conditions	6	.878

Bagozzi and Yi (1988) recommend a benchmark reliability of about 0.60 threshold, while Nunnally (1978) suggests 0.70 as a guideline for the reliability threshold. It was decided to follow the former in adopting 0.60 as a benchmark as their findings are more recent than Nunnally's. Therefore, as indicated from the above table, the results of the pilot test were all above the specified threshold, hence the questionnaire was considered reliable as an instrument.

5.4.7 *Reliability and Validity of the Questionnaire*

Fishbein and Ajzen (1975, p. 108) concluded that the question of reliability does not pose a major problem for the measurement of beliefs, attitudes, and intentions when appropriate research instruments are employed.

In this study, the internal consistency reliability is measured by applying the Cronbach alpha test to the individual scales and the overall measure. It was found that the results ranged between .60 and .94. As the Cronbach alpha values for all the constructs in the model are greater than the guidelines of 0.60 as specified by Bagozzi and Yi (1988), therefore, it was concluded that the scales can be applied for the analysis of the available data with acceptable reliability.

To ensure the content validity of the questionnaire, it was assessed with continuous review of relevant literature to ascertain that constructs chosen were representative of the model variables and are understandable. Past studies conducted in the field of information technology adoption were the basis for the selection of the items used in the questionnaire as similar studies were reviewed. The items for each scale were chosen in accordance with the literature in addition to newly developed ones as some studies did not cover all domains of the constructs considered in the proposed model with relation to online banking research.

Construct validity refers to the degree to which the test or the questionnaire score is a measure of the psychological characteristic of interest which can be inferred from all of the logical arguments and empirical evidence available (Park *et al.*, 2004). One method of construct validation is factor analysis which reduces a large number of measures to a smaller number by specifying which measures provide the same results (Kerlinger, 1980, p. 468).

5.5 SAMPLE FRAMEWORK

Finding a representative sample frame is a major and basic step in conducting any type of research. The results of the tested hypotheses and the subsequent inferential statistics are dependent on the characteristics of the sample used for the study. All this necessitates that careful attention and care be paid to the selection of the sample frame depending on the nature of the research on hand.

The population relevant to this research includes all the customers who have a bank account in Bahrain, have access to computers and have an Internet connection. The sample frame was selected using the banking sector's database. In addition, the questionnaire was distributed to a number of businesses, public and private organisations and household members throughout Bahrain.

Online banking has made real headway on this island with adoption rate standing at around 20 percent of Internet users which is approximately equivalent to the rate in many Western countries (Internet World Stats, 2007). In addition, the personal computer penetration in Bahrain is the highest in the Arab world with the number of households having at least one personal computer at home as more than 50% of households and 100% of businesses have a fixed-wired phone connection (Appendix 4).

When selecting the population for the survey, care was taken to ensure that the mix is balanced in terms of gender, social status, education, and other demographic variables as it should reflect the demographic composition of the online banking consumers in Bahrain along dimensions such as gender, income, education level, and age. This obstacle was dealt with by running frequency tests on the personal characteristics of random segments of the

sample collected and comparing it to the literature available from previous studies to find out if any similarities and trends were detected.

5.5.1 *Inclusion Criteria*

As there is technology involved in this electronic banking research, it is assumed that both current users and non-users of this service are already users of personal computers and the Internet before engaging in the decision-making process of online banking adoption.

The participants in this study were presented with a questionnaire which is applicable for both users and non-users and does not require that all participants have already used the online banking services. Accordingly, the sample considered here included only those participants who were capable of making the online banking adoption decision for themselves. The study inclusion criteria were as listed below:

- At least 18 years old
- Have access to a personal computer
- Have access to Internet connection
- Have a bank account with one of the island-based banking establishments
- Have the ability to make electronic banking adoption decision for themselves

5.5.2 *Sample Size*

According to the Bahrain Telecommunication Company (BATELCO), the main provider of Internet services on the island, the number of Internet users in Bahrain for the year 2005 was 152,700 users out of a total population of 688,345 (BATELCO, 2005 estimate). This 22% penetration rate of the

Internet may include both users who access the Internet at least several times a week and those who access it only once within a period of several months. However, more recent statistics from Bahrain indicate that this number has risen to reach over 79,000 subscribers by the end of the year 2007 (see Chapter 3).

The sample size and distribution selected for the questionnaire component of the research design was, of course, more critical. The sample size had to be large enough to assure that it is representative and minimise sampling error (Tuckman, 1978). Of additional concern was the demand placed upon sample size by the statistical methods to be employed for data analysis which will be described in detail in the final section of this Chapter. A sample frame of 1500 respondents was chosen in an attempt to achieve a target sample size of 500. The attainment of this target sample size assumed a response rate of at least 33 percent. As the target sample size is to include both users and non-users of online banking services with the inclusion criteria specified in the previous section, this would constitute a sizeable portion of the population.

To test that the sample considered is valid as a representative of the whole population, the demographic characteristics of a cross section of the sample was analysed while waiting for the total responses to be collected for final analysis. The results of this specimen of the sample (n=414) are presented in Table 5.2. Demographic information includes gender, marital status, age, income, education and occupation of respondents for both current users and non-users of online banking services. Approximately 67% of the sample was male. The majority of the subjects had some university education (45%) and more than 65% were younger than the age of 40 years. More than a third of the subjects had an average monthly income of above BD1000 and 46% held professional and executive level occupations.

Table 5.2: **Demographic Profile of the Sample**

Demographic Variable	Current Users		Current Non-users		Total	
	Frequency	%	Frequency	%	Frequency	%
Gender						
Male	164	69.5	114	64	278	67
Female	72	30.5	64	56	136	33
	236	100	178	100	414	100
Marital Status						
Married	175	74.5	129	72.5	304	73
Single	60	25.5	49	27.5	110	27
	235	100	178	100	414	100
Age Group						
18 – 24	28	11.9	26	14.6	54	13
25 – 29	50	21	36	20.2	86	20.8
30 - 34	41	17.4	34	19.1	75	18.12
35 – 39	37	15.7	24	13.5	61	14.73
40 – 44	40	17	20	11.25	60	14.5
Above 44	40	17	38	21.35	78	18.8
	236	100	178	100	414	100
Profession						
Student	4	1.7	6	3.3	10	2.4
Self-employed	2	0.9	5	2.8	7	1.7
Professional	72	30.5	48	27	120	29
Executive/Manager	55	23.3	17	9.6	72	17.4
Academic	11	4.7	9	5	20	4.8
Technician	8	3.4	11	6.2	19	4.6
Office worker	81	34.3	73	41	154	37.2
Retiree	2	0.9	5	2.8	7	1.7
Housewife	1	0.4	2	1.1	3	0.7
Other	0	0	2	1.1	2	0.7
	236	100	178	100	414	100
Monthly Income						
Less than BD200	0	0	3	2	3	0.7
BD200 – BD400	12	5	31	17.4	43	10.4
BD401 – BD600	47	20	43	24	90	21.7
BD601 – BD800	34	14.4	32	18	66	16
BD801 – BD1000	43	18.2	18	10	61	14.7
Above BD1000	100	42.4	51	28.6	151	36.5
	236	100	178	100	414	100
Education						
Secondary	10	4.2	21	11.8	31	8
University/College 1- 4 years	106	45	81	45.5	187	45
University/College 5 years or more	84	35.6	50	28.1	134	32
Professional Degrees	36	15.3	26	14.6	62	15
	236	100	178	100	414	100

However, the ability of this sample size to produce a representative sample depended in the first place on the adequacy of the sampling frame from which the sample of 500 was drawn. When the demographics of the sample were analysed, they represented a replica of what the literature review indicated about the characteristics of online banking users in many countries. These were: the majority males, well educated, above average income earners and occupying jobs of executive and professional levels. This reinforces the previous findings that education, age, income, and profession are strong predictors of adoption status (e.g. Jayawadhena and Foley 2000, Mattila *et al.*, 2001). A summary of some of the online banking studies showing this pattern was presented in Chapter 2.

5.5.3 *Empirical Measures and Analysis Strategy*

In this research, out of the total number of questions, six were related to demographic characteristics of the respondents while the remainder addressed the various constructs of the theoretical model. Demographic questions covered individual characteristics such as gender, marital status, age, profession, monthly income and education. These individual characteristics variables have been recognised as important in Internet and information technology research (e.g., Hoffman and Novak, 1996).

5.5.3.1 Intention

Behavioural intention to adopt online banking services from both user and non-user respondents was measured on a 7-point question inquiring about the possibility of adopting online banking in three different time intervals (1 – 6 months, 7 – 12 months, 13 – 18 months). It was a single item measurement anchored by 'very unlikely' (1) on one end and 'very likely' (7) on the other. The higher the score, the greater the intention to adopt online banking services is within the time context chosen for the response.

However, to answer the sixth research question relating to the possibility of prediction and segmenting the current non-adopting banking customers based on their intention into two categories: potential adopters and persistent non-adopters, it is necessary to investigate the intention scale thoroughly to arrive at a probability of classifying non-adopters into either of the previous two categories.

Respondents are first categorised into two main groups (users and non-users of online banking). Then to help us identify the potential users from the persistent non-users on the basis of the behavioural intention variable, respondents were asked about their future intention to use online banking services within three different periods of time (next 1 – 6 months, 7 – 12 months; and 13 – 18 months) from which they have to select one. A scale of 7-point rating was used rating from 'very unlikely' (1) to 'very likely' (7). The respondents who selected 'very likely' or 'somewhat likely' were classified as 'potential users'. Those respondents who answered 'very unlikely' or 'somewhat unlikely' were classified as 'persistent non-users'.

5.5.3.2 Attitude

Attitude was measured according to the beliefs the customers hold regarding online banking services and the evaluative responses associated with those beliefs in accordance with studies cited in the literature and as suggested by Fishbein and Ajzen (1975). The semantic differential technique introduced by Osgood (1952) was used which is in agreement with Fishbein and Ajzen (1975) as it is of a bipolar evaluative dimension. Mathieson (1991), Davis (1993), Szanja (1994), Taylor and Todd (1995a), and Morris and Dillon (1997) have all applied the Osgood technique in studies conducted in the information technology field. Four bipolar adjectives indicating different aspects of attitude towards use (good idea—bad idea, wise—foolish,

favourable—unfavourable, beneficial—unbeneficial) were used to describe the decision of going online to do banking transactions. Respondents were asked to rate their feelings on a 7-point scale about using the system using the four sets of adjectives. The items used for attitude measurement were very similar to those used by Davis (1989), Taylor and Todd (1995a) and Bhattacherjee (2000).

5.5.3.3 Subjective Norms

Subjective norms were measured by three items relating to the influence of three groups of people on the respondents in taking the decision to adopt online banking services (friends, family, and peers/colleagues). As discussed in Chapter 2, Venkatesh and Davis (2000), Bhattacherjee (2001), and Mathieson, *et al.* (2001) have used the same three items to measure subjective norms in terms of the influences of family, friends and people whose opinion counts. They were rated on a 7-point scale ranging from 'strongly disagree' to 'strongly agree' as suggested by Fishbein and Ajzen (1975).

5.5.3.4 Perceived Behavioural Control

This construct refers to the perceived ease or difficulty of performing the behaviour and it is assumed to reflect the internal and external constraints on the behaviour. The decomposed version of the Theory of Planned Behaviour (TPB) (Taylor and Todd, 1995b) decomposed beliefs constructs and indicated that self efficacy, resource facilitating conditions and technology facilitating conditions are the most relevant determinants of behavioural control. A set of three statements investigated the perception of the individual's ability to control the online transaction environment and ownership of necessary means and resources to do so. All three items on the scale used a 7-point Likert response ranging from 'strongly disagree' (1) to 'strongly agree' (7).

5.5.3.5 Perceived Ease of Use

Information systems that users perceive easier to use and less complex will increase the likelihood of its adoption and usage (Agarwal and Prasad, 1997; Teo *et al.*, 1999). According to several researches on TAM (Davis *et al.*, 1989; Teo *et al.*, 1999; Venkatesh and Morris, 2000), perceived ease of use (PEU) has been shown to influence behaviour (i.e., information technology adoption) through two causal ways: (1) a direct effect on behaviour and (2) an indirect effect on behaviour via perceived usefulness (PU).

The questionnaire employed five perceived ease of use items which were adapted from previous studies in the literature based on Davis's (1989) Technology Acceptance Model. The items used asked the respondents about the ease of navigation on their bank's website, whether online banking is an easy way to do banking, whether instructions were easy to follow and whether learning to use the online service would be easy to the respondent. In addition to Davis (1989), similar operations used here to measure perceived ease of use are also found in research conducted by Taylor and Todd (1995a) and Bhattacherjee (2000). All five items on the scale used a 7-point Likert response ranging from 'strongly disagree' (1) to 'strongly agree' (7).

5.5.3.6 Perceived Usefulness

A number of empirical studies have already validated the relationship between perceived usefulness (PU) and user acceptance of information systems (e.g. Davis, 1989; Davis *et al.*, 1989; Mathieson, 1991; Hendrickson *et al.*, 1993; Segars and Grover, 1993; Lerderer *et al.*, 2000; Lin and Lu, 2000; Venkatesh and Davis, 2000). It is expected that users will accept information systems if they perceive the systems would help them to attain the desired performance. Accordingly, the items included for measurement of this construct included a set of four statements measuring the usefulness of online banking to the user in terms of extra free time and that it makes

banking transactions easier to conduct. All four items on the scale used a 7-point Likert response ranging from 'strongly disagree' (1) to 'strongly agree' (7).

5.5.3.7 Perceived Risk

As cited in Chapter 2, Bhimani (1996) and Ratnasingham (1998) suggested that any electronic commerce transaction should satisfy the fundamental requirements relating to the following security issues: authentication, authorisation, availability, confidentiality, data integrity, non-repudiation, and selective application services. Therefore, in accordance with the literature four items were selected for the independent variable of risk in online banking transaction and they are identified as follows: privacy, security (authentication), non-repudiation, and overall perceived risk of online transactions. All four items on the scale used a 7-point Likert response ranging from 'strongly disagree' (1) to 'strongly agree' (7).

5.5.3.8 Culture

As the theoretical model proposes that cultural dimensions in terms of collectivism and status-seeking will have a moderating effect on the individual's attitude toward adopting online banking, it is included as an independent variable. As described in Chapter 2, Straub *et al.* (1997) indicated that individuals in countries that score low on individualism may be more inclined to use rich media such as face-to-face rather than technology (online banking in this case) since the former can more readily transmit social situation cues which are deemed important and desirable for collectivist cultures. Bahrain, being a part of the Arab world, is a collectivist society where individuals are connected with strong societal bonds and there is more emphasis on group decision-making and conformity. Cho *et al*, (1999) and Han and Shavitt (1994) emphasised that such societies value in-group

obligations, extended family structures and interdependence. Therefore, societal norms and societal pressure have been shown to have a significant impact on behavioural intention formation in collectivist societies (Lee and Green, 1991). The three items on the culture scale used a 7-point Likert response ranging from 'strongly disagree' (1) to 'strongly agree' (7).

5.5.3.9 External Influences

This construct represents the marketing efforts of banks to increase the usage of online banking in Bahrain. To measure the external influences variable, two sources were considered; the influence of media and the bank itself. These two dimensions include and extend the measures used by Bhattacherjee (2000) and Taylor and Todd (1995a). The questions investigated the role of media and advertising in pushing toward adoption of online banking in Bahrain in addition to reputation, familiarity, ownership of the bank and bank employees' role in encouraging adoption. A set of six statements using a 7-point scale with responses ranging from 'not at all important' (1) to 'very important' (7) was used.

5.5.3.10 Interpersonal Influences

The interpersonal influences construct concentrated on peers' influence on the process of online banking adoption decision making. Two statements relating to the importance to attach one's decision with others around him/her were considered in this part. Both items on the scale used a 7-point Likert response ranging from 'strongly disagree' (1) to 'strongly agree' (7).

5.5.3.11 Self Efficacy

The construct self confidence, cited in the literature as 'self efficacy' (Bandura, 1994), was based upon studies conducted by Bhattacherjee (2000)

and Taylor and Todd (1995b). A set of five statements measured on a 7-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (7) was used. The statements investigated confidence in one's ability to use the system with no help from anyone, with no prior experience, with the availability of online instructions only, and the way individuals perceive themselves as being confident in their abilities and experienced as users.

5.5.3.12 Facilitating Conditions

The country's telecommunication infrastructure and the available services provided by it, Central Bank of Bahrain (CBB) role as the sole controller of all financial institutions in Bahrain and the government of Bahrain role were issues that are considered as part of the facilitating conditions environment significant to the adoption of online banking services. The issue of facilitating conditions is measured using a set of six statements presented to the respondents to be rated on a 7-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (7).

5.5.3.13 Individual Differences

As demonstrated in the literature, demographic variables, such as age, gender and level of education, personality variables related to computer technology, such as computer anxiety, computer self-efficacy, computer skills, cognitive style , and situational variables, such as employment categories, cognitive absorption with computers and experiences of general computer usage or specific system usage, are all empirically examined as important factors that influence individual technology acceptance behaviour. Mathieson *et al.*, (2001) have emphasised the importance of some demographics such as age and education levels on the adoption process of information technology systems. Others such as Majchrzak and Cotton (1998), Morris and Venkatesh (2000), Brigman and Cherry (2002), have all established that individual

demographics play an active role in shaping attitudes and behaviour toward technology adoption.

Therefore, some personal data questions were deemed necessary to be included in the data collection instrument which included gender, marital status, age, profession, income and education.

5.6 DATA ANALYSIS

The analysis of the data collected from the respondents will be presented in the next two chapters. The following is a description of the analytical techniques which are used to analyse the data with emphasis on the reasons for the choice of each tool.

5.6.1 *Descriptive Data Analysis*

An overall descriptive analysis of the responses will be presented with emphasis on the individual differences among the sample participants in general and comparison of the users and non-users segments in particular. By using frequencies to summarise the findings for the demographic variables of the responses, the influence of each of these variables on the adoption of online banking among the sample will be highlighted.

5.6.2 *Correlation Coefficients*

Correlation analysis is also used next to examine the relationships between two or more variable. A correlation coefficient "is the square root of the coefficient of determination, with the arithmetic sign being designated as positive if the relationship is direct and negative if the relationship is inverse" (Kazmier and Pohl 1984; p. 375). In addition, correlation can be measured by means of the correlation coefficient which if it is closer to 1.0, the greater the

correlation. The significance of a correlation coefficient depends on its magnitude and how close it is to 0 and the sample size and is assessed by a t-test. This test will indicate if the correlation is significantly different from zero.

5.6.3 *Analysis of Variance (ANOVA)*

In order to get a thorough understanding of online banking usage, ANOVA by age is conducted. This is in an attempt to find out if the results will yield some statistically significant differences in means between the age groups of the subjects.

5.6.4 *Chi Square and T-Test*

The differences in demographics between users and non-users are tested with a chi-square test and a t-test. The chi-square test helps show if there are any significant differences between the groups in each demographic variable. A second step in the demographic analysis is independent sample t-tests between users and non-users measured on rank-order scales.

The chi-squared difference test will also be used to ascertain any differences between the structural parameters across the sample. To check how well the statistical model actually reflects the data, chi-square goodness of fit test is applied to the data. In general the chi-square test statistic is:

$$X^2 = \sum_{i=1}^{k} \frac{(\text{observed} - \text{expected})^2}{\text{expected}}$$

If the computed test statistic is large, then the observed and expected values are not close and the model is a poor fit to the data.

5.6.5 *Binary Logistic Regression*

To help classify the non-user group of respondents into potential users and persistent non-users, a binomial logistic regression is employed. As the distribution of the results for the non-user group of respondents is binomial, i.e. outcome is 0 or 1 (Potential user or Persistent non-user), the following model is used:

$$\text{Logit}(P) = \log(\frac{P}{1-P})$$

Where P = Probability of outcome (potential user or persistent non-user)

The Logit is the natural logarithm of the odds ratio and has several advantages: If logit (P) has been estimated then P can be calculated and it should be between 0 and 1. If probability of potential users is larger than persistent non-users then this function is positive, otherwise it is negative.

According to Akinci *et al.*, (2007) most of the multivariate analysis techniques require the basic assumptions of normality and continuous data, involving the tested variables which should be accounted for in the data collection. They claim that the commonly used measurement scales such as five-point Likert, ordinal, and nominal scales are usually considered unsuitable for multivariate analysis techniques, whereas much stronger interval and ratio scales provide a good basis for a more comprehensive analysis (Akinci *et al.*, 2007). On the other hand Hyman and Young (2001) also claim that the most commonly used multivariate method is regression in international marketing research. It is expected that logistic regression approach to do better when there is evidence of significant departures from multivariate normality as is the case where there are some dichotomous or zero/one variables (Green *et al.*, 1998).

5.6.6 *Path Analysis*

As this research tests a theoretical model to explain the factors that affect the behavioural intentions toward online banking adoption by customers in Bahrain, path analysis is employed to secure this information. This analysis allows for the proposed hypotheses within the model to be tested and explain the relationships between the constructs proposed based on the literature while simultaneously permitting the assessment of the overall quality of the model's fit to the data to be obtained. The path analysis also shows the direction of relationships between variables tested and tests for mediating relationships.

Path analysis was developed by Sewall Wright as a mean to investigate the direct and indirect effects of variables hypothesised as causes of variables treated as effects (Wright 1960). The aim of the path analysis is to provide quantitative estimates of the causal connection between a set of variables. It examines the pattern of a relationship between three or more variables. However, it cannot reject or accept the hypothetical causal imagery (Bryman *et al.*, 1997; p. 269). Pedhazur (1982, p. 580) states that path analysis "is not a method for discovering causes, but a method applied to a causal model already formulated on the basis of knowledge and theoretical considerations". Huang *et al.* (2004, p. 149) suggested that the goal of path analysis is to "provide plausible explanations of observed correlations by constructing models of cause-and-effect relations". Although Allison (1999) suggested that path analysis is little more than graphic illustration of multiple regression, path analysis is usually employed when complex relationships exist between variables that may be adequately examined using multiple regression analysis (Foster *et al.*, 2006).

5.7 SUMMARY

The data collecting instrument used in this research is the questionnaire which was first developed and pre-tested, and translated into Arabic. After making the necessary edits, the finalised questionnaire covered the following major areas:

(a) Screening questions to identify online banking users and non-users
(b) Usage rate and type of Internet in general and online banking in particular, if applicable
(c) Attitudes toward online banking
(d) Perceptions and beliefs about online banking services in Bahrain

The scales which were used to measure each of the variables included in the proposed model were developed on the basis of the literature and existing measures. To measure beliefs and attitudes two types of scales were mainly used; i.e. 7-point Likert scale (agree-disagree, important-unimportant, and likely-unlikely) in addition to the semantic differential scale (unfavourable-favourable, unbeneficial-beneficial, Bad-Good, foolish-wise).

The sample collected is considered to be representative of the population in accordance with previous empirical research in the field of technology adoption which explains the resulting higher general education of the subjects and the low number of female subjects.

The statistical methods used in this research are several. Chi-square, ANOVA and t-tests, correlations and regression analyses will be applied.

In the next Chapter a detailed analysis of the collected data will be presented with discussion of the results and their implications for the theoretical model.

CHAPTER 6

SURVEY ANALYSIS

6.1 INTRODUCTION

In the Research Methodology and Methods Chapter, the statistical tools were outlined for the purposes of data analysis and hypotheses testing and a description of the methods to be followed using the statistical package SPSS were also presented. In this chapter, the description of the characteristics of the study sample and the results of the different statistical tests stated in chapter 5 are discussed. In addition, reliability analyses are conducted to confirm the consistency of the scales used. Correlation tests will also be presented and analysed. In the final part of this chapter, a summary of the results of these tests is presented.

The data was collected using a questionnaire from January 2006 until November 2006. A total of 1500 questionnaires were distributed both by mail and in person with a dual-language cover letter explaining the purpose of the survey (Appendix 2). A copy of the survey was also translated into Arabic to accommodate for those respondents who prefer to use their mother tongue in completing the survey. From all 1500 questionnaires distributed in both languages, 358 were returned completely blank, 124 were partially incomplete, and 447 were not returned at all. Accordingly, 571 questionnaires were considered to be valid to be used for the purpose of this study and the others were discarded with an effective response rate of 38%. The blank copies were returned to the researcher mainly from government ministries and organisations. This could be due to the fact that employees in these ministries were unable to complete the questionnaires because the working hours in the public sector are shorter than those in the private sector and time is an element of high importance to complete work on hand.

However, the issue of unreturned questionnaire copies could be explained by a number of reasons such as some of the potential respondents who were contacted by mail may have changed their addresses or been out of the country. Taking the issue of non-response bias into consideration, this could be the case for some of the unreturned questionnaires, but it must be a very small number as the Cronbach's alpha test confirms the reliability of the sample (see Chapter 5). Therefore, non-response bias is not an issue with this sample.

6.2 DATA PREPARATION AND SCREENING

In preparation to perform the statistical tests discussed in Chapter 5 and ensure the accuracy of the analysis of the model used in this research, it was deemed necessary to screen and prepare the data to avoid any potential impurity which could result in the failure of the model fitting program. In this section of the chapter a description of the procedure followed to ascertain adherence to distributional assumptions is presented.

6.2.1 *Non Normality*

Once data were collected from respondents, they were entered into SPSS for screening to investigate any cases of non-normality. The result of the skewness and kurtosis analysis for each variable used in the model was within the acceptable values as defined by West *et al.*, (1995). The graphs in Appendix 3 indicate that the skewness and kurtosis are not of statistical concern.

6.2.2 *Internal Consistency*

In order to investigate the internal consistency of the measurement scales of the survey, Cronbach's Alpha was applied to the responses collected. Table 6.1 presents the results of this reliability test conducted on the whole valid

responses and demonstrates a composite reliability exceeding the 0.60 value as suggested by Bagozzi and Yi (1988).

Table 6.1: **Reliability Analysis of Variables of the Proposed Model**

Scale	Number of Items	Standard Item Alpha
Attitude	4	0.945
Subjective Norms	3	0.876
Perceived Behavioural Control	3	0.844
External Influences	6	0.633
Perceived Ease of Use	5	0.753
Perceived Usefulness	4	0.903
Security	5	0.852
Interpersonal Influences	2	0.702
Cultural Influences	3	0.650
Self Efficacy	5	0.881
Facilitating Conditions	6	0.821

6.3 DEMOGRAPHIC CHARACTERISTICS OF STUDY SAMPLE

In the first part of this section, a summary of the demographic characteristics of the study sample is presented. This will be followed by segmenting the sample into two categories: users, and non-users. A comparison of these categories will be discussed in the light of the demographic profile differences which may help shed some light on understanding the role of these differences in the process of online banking adoption in Bahrain.

Table 6.2: **The Sample Demographics Summary**

Variable	n	%
AGE (Years)		
18 - 24	75	13.1
25 – 29	118	20.7
30 - 34	105	18.4
35 – 39	83	14.5
40 – 44	89	15.6
Above 44	101	17.7
GENDER		
Male	378	66.2
Female	193	33.8
MARTIAL STATUS		
Married	412	72.2
Single	159	27.8
EDUCATION LEVEL		
Secondary School	36	6.3
University/College 1 – 4 years	258	45.2
University/College 5 years or more	194	34.0
Professional Degree (e.g. CPA,CPEng, etc)	83	14.5
PROFESSION		
Student	11	1.9
Self-employed	10	1.8
Professional	180	31.5
Executive/Manager	91	15.9
Academic	34	6.0
Technician	26	4.6
Office Worker	203	35.6
Retiree	11	1.9
Housewife	3	0.5
Other	2	0.4
INCOME LEVEL (in Bahraini Dinar)		
Less than 200	3	0.5
200 – 400	54	9.5
401 – 600	129	22.6
601 – 800	95	16.6
801 – 1000	73	12.8
Above 1000	217	38.0

6.3.1 *Gender*

Analysis of the responses collected indicates that out of 571 respondents, the majority of the sample was male (66.2%) while only 33.8% was female. By looking at the latest Economic Indicators prepared by the Central Bank of Bahrain in association with the Bahrain Informatics Organisation regarding the labour force for the first quarter of the year 2008 (Appendix 4), it can be seen the total number of Bahraini males in the workforce exceeds the number of Bahraini females (87.48% male as opposed to 12.51% female). This disparity in the ratio between the male/female categories may explain the high percentage of male responses obtained in the survey. The same disparity also is observed among the two non-Bahraini genders which participate in the country's labour force (94.88% male as opposed to 5.11% female).

6.3.2 *Age*

The 25 – 29 years of age group represented the largest group of the sample with 20.7%, followed by 30 – 34 years of age with 18.4%, above 44 years of age with 17.7%, 40 – 44 years of age with 15.6%. The remaining two age groups of 35 – 39 and 18 – 24 years of age scored 14.5% and 13.1% respectively. The following graph summarises these distributions.

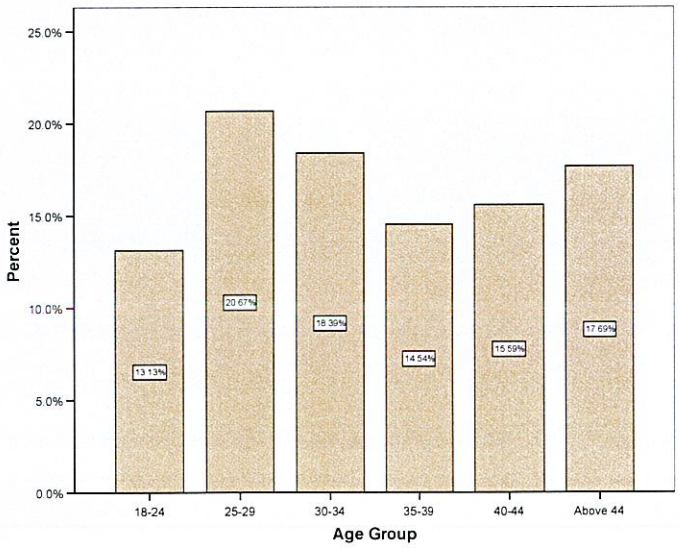


Figure 6.1: **Demographic Profile of Respondents: Age**

6.3.3 *Marital Status*

It was found that the majority of the sample was married (72.2%) while the single status was represented by only 27.8%. The religion and the specific culture of the Bahraini society play influential roles in shaping the lives of its individuals. As Muslims and from a Middle Eastern society, people are expected to start families of their own at an early age as compared to the West. In Arab culture, marriage is also a well-defined turning point that bestows prestige, recognition, and societal approval on both partners. Although the definition of an 'early age' has changed over the years and early marriage is on the decline in the Arab world, the number of Arab teenagers who are married is still significant (Shah 2004). The average age of starting a family in Bahrain is 25 for women and 30 for men. This may explain the tendency of the sample to consist mostly of married respondents.

6.3.4 *Education*

The distribution of the education level of the sample indicated a high percentage of respondents with some college/university education (45.2%) and 34% of respondents with 5 years or more of higher education. The following graph summarises these findings.

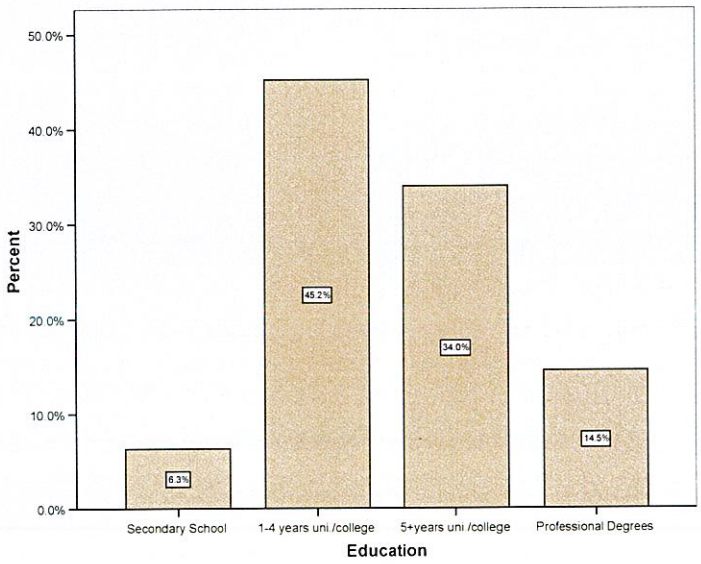


Figure 6.2: **Demographic Profile of Respondents: Education**

The tendency for the sample to include such a high percentage of university/college educated individuals could be explained by examining the national statistics presented in Appendix (4) which displays data for the working Bahraini population by highest education, gender and occupation groups. The sample for the study was taken from both private and public sectors and the Bahrain statistics show that those with secondary school leaving certificate or less are mainly working in auxiliary jobs, agriculture and sales workers. For the purposes of this research, such occupations were not included as most of them were at or slightly below the minimum wage and therefore were excluded as literature implies that online banking is adopted by well-paid individuals (see Chapter 2).

6.3.5 *Profession*

Ten categories of professions were presented to respondents to select the one which best reflects their professional status. The largest percentage of the sample was office workers (35.6%), while other professional jobs were placed second in the ranking with 31.5% followed by executives and managers with 15.9%. The remaining seven profession classifications scored low with percentages varying from 4.6 – 0.4.

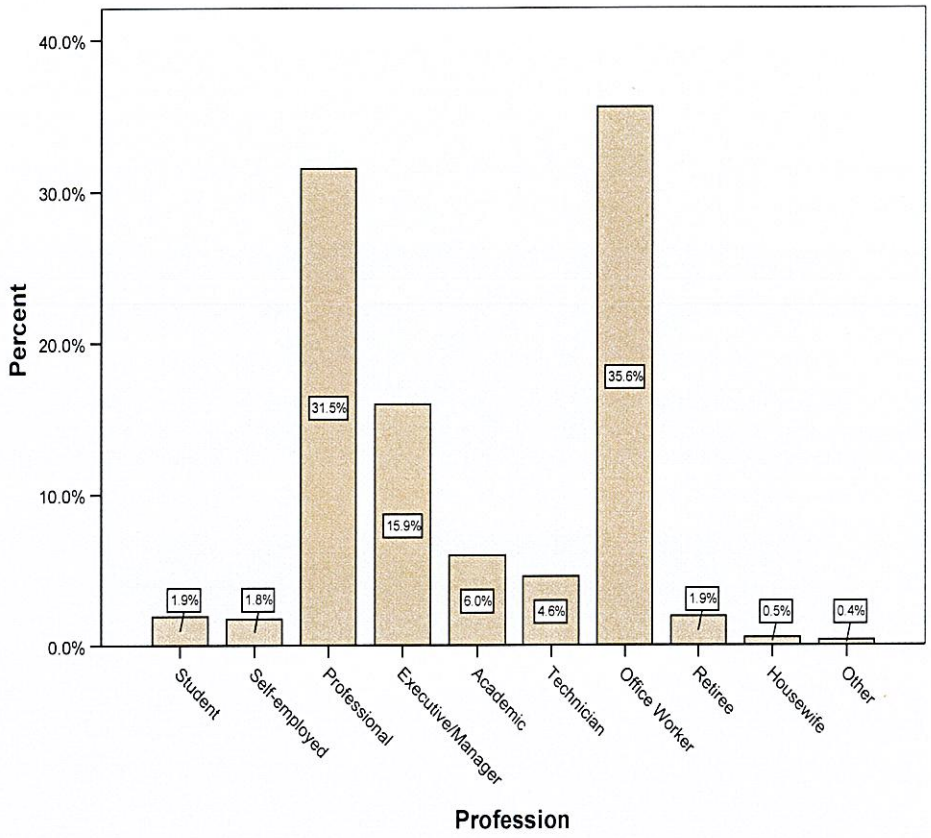


Figure 6.3: **Demographic Profile of Respondents: Profession**

Comparing this sample with the population of Bahrain, the national statistics presented in Appendix (4) depict the distribution of the working population by occupation sub-groups and the office workers and professional categories are both quite substantial (31% and 26%, respectively) which may explain the tendency of the sample to be mainly from these two categories.

6.3.6 *Income Level*

The respondents' income level varied with the largest group (38%) above 1000 Bahraini Dinars per month (above Sterling Pounds 1300 per month) category. The 401 – 600 BD group ranked second with 22.6%. The following graph summarises these results.

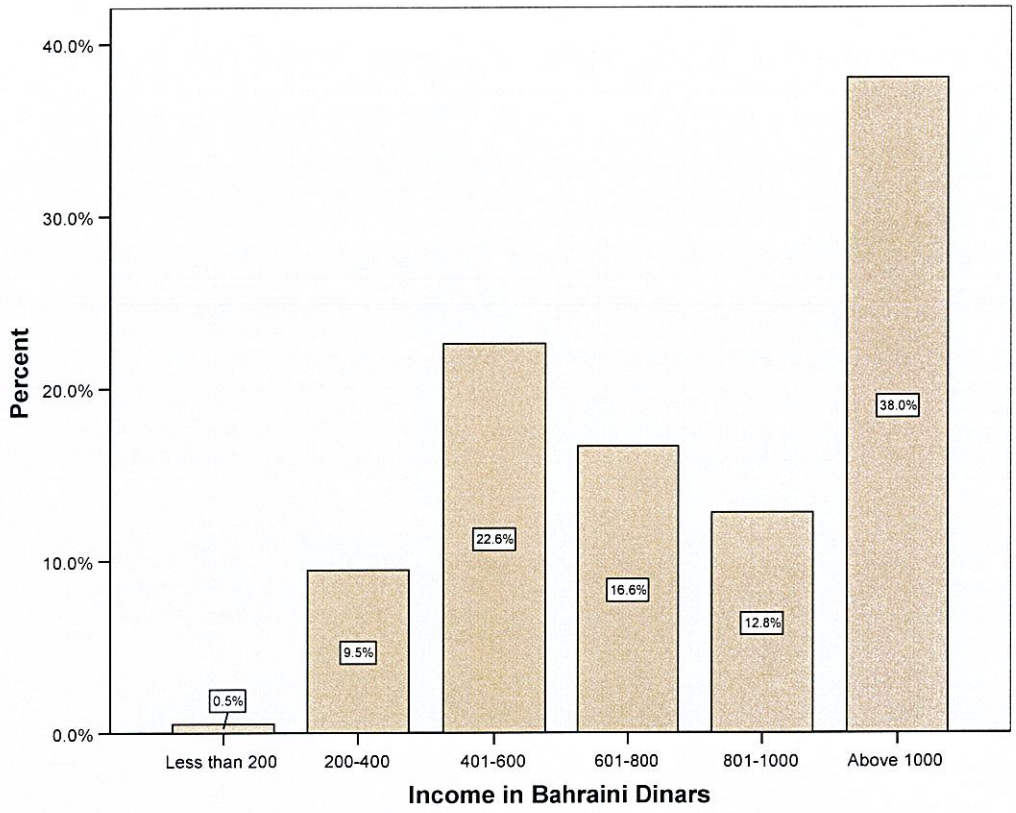


Figure 6.4: **Demographic Profile of Respondents: Income**

The national statistics for Bahrain for the first quarter of 2008 indicate that the average monthly salaries for the private sectors is about BD266, while those for the public sector is about BD772 (Appendix 4). Accordingly, the data collected from the respondents and displayed in the above graph show that there is a slight inconsistency with the national statistics as the majority of the sample were above the suggested averages for both sectors and some differences in salary averages do exist.

6.4 PRELIMINARY SEGMENTATION OF RESPONDENTS

To better understand the differences between users and non-users in the study sample, a preliminary segmentation of the respondents was carried out. By doing so, it would be easier to identify any differences in these two segments which may help yield some understanding of online banking adoption in Bahrain.

6.4.1 *Comparison of the Demographic Profile of Online Banking Users and Non-users*

Responses to both questions 6 and 7 from the questionnaire helped segment the respondents into two main categories, namely users and non-users of online banking in Bahrain. The following section describes the major demographic profile differences among these two categories and how it may help explain the role of demographics in the online banking adoption process.

6.4.1.1 Gender

Figure 6.5 depicts the gender distribution among the study participants. In agreement with most studies that indicated that the typical online banking user is a male (Jayawardhena and Foley, 2000), results show that in Bahrain also, the typical user is a male. Almost 70 percent of the users were males. It was interesting also to find that the non-users majority consists mainly of males (62%) compared to females (38%) which is mainly due to the fact that the majority of the respondents were males. Singh (2004) and Laforet and Li (2005) revealed that more males used online banking than females in South Africa and China, respectively, where they conducted their researches. Accordingly, in tandem with the technology adoption literature, it was expected that the percentage of male non-users would be low in comparison to female non-users in this study (see Chapter 2). Therefore, the disparity of male/female ratio in the sample itself affected this particular expected outcome.

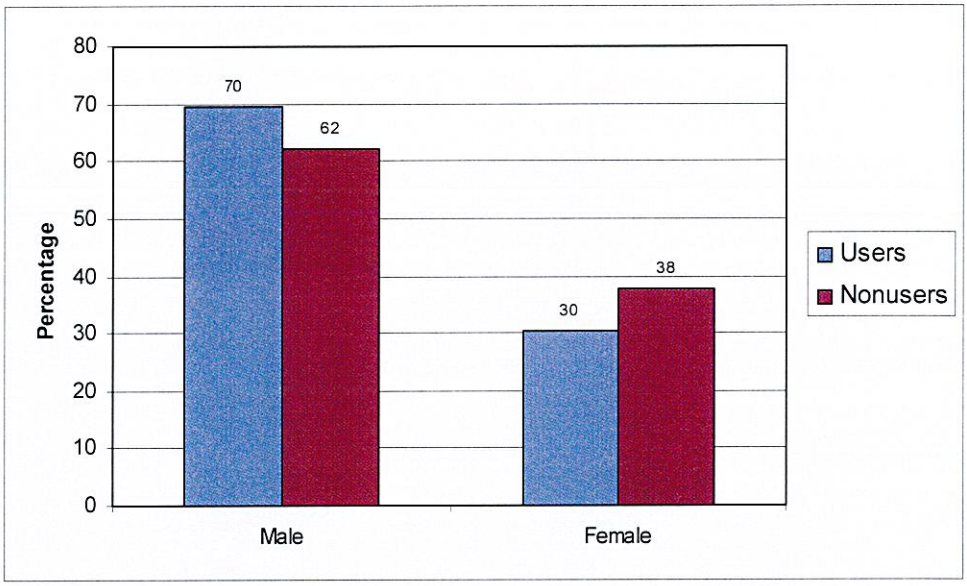


Figure 6.5: **Gender Distribution among Study Participants**

Taking the percentage of male users as a percentage of the online banking users category (70%) as compared to female users (30%), the findings are consistent with those discussed in the technological services adoption literature which suggests that the typical online banking user is usually a male. However, the percentages of users and non-users categories for both males and females depict slight differences within each particular category.

Therefore, from the above chart, although gender does have some influence on the decision to use online banking services, it does not appear to be as significant as other demographic variables. In addition the chi-square results for the Gender variable when comparing users to non-users proved to be insignificant (.065) (Please refer to Table 6.8).

6.4.1.2 Age

The age distribution between the two groups of respondents shows that the age groups are close for both groups. For example within the 30 – 34 years group and the 35 – 39 years group the difference between users and non users is only one percentage point (18% non-users - 19% non-users, and 15% users - 14% non-users, respectively). However, when looking at the other age groups, the adoption percentages gap within each particular group gets bigger, particularly for the older participants where users were only 15% of the sample as compared to 21% non-users. In general, these results suggest that the online banking user is typically young to middle aged customers.

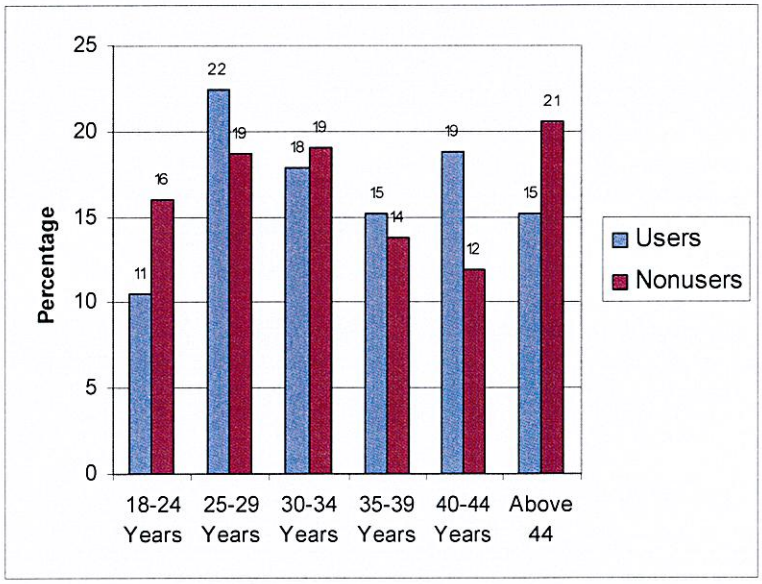


Figure 6.6: **Age Distribution among Study Participants**

The chi-square results for the Age variable when comparing users to non-users proved to be significant (.049) (Please refer to Table 6.8). This finding is also in agreement with most literature findings that suggest that the online banking user is usually young (see Chapter 2). Therefore, age seems to be an influential factor in the determination of online banking usage.

6.4.1.3 Martial Status

Both married male users and married male non-users represented the majority of the study participants (72% for both groups). In addition, the percentage of married female users and female non-users were also the same (28%). The study sample itself was mainly dominated by men (users and nonusers) (66% males and 34% females). The high percentage of the married status group could be diagnosed as the result of cultural influences as previously explained. As the average age of the respondents was within 25 – 29 years age group, it is culturally considered the ideal age to start a family. However, the frequency results displayed in Figure 6.7, suggest that there is actually no influence of the marital status on the adoption of online banking as results are identical for both segments of the sample. In addition, the chi-square results for the Marital Status variable when comparing users to non-users proved to be insignificant (.944) (Please refer to Table 6.8).

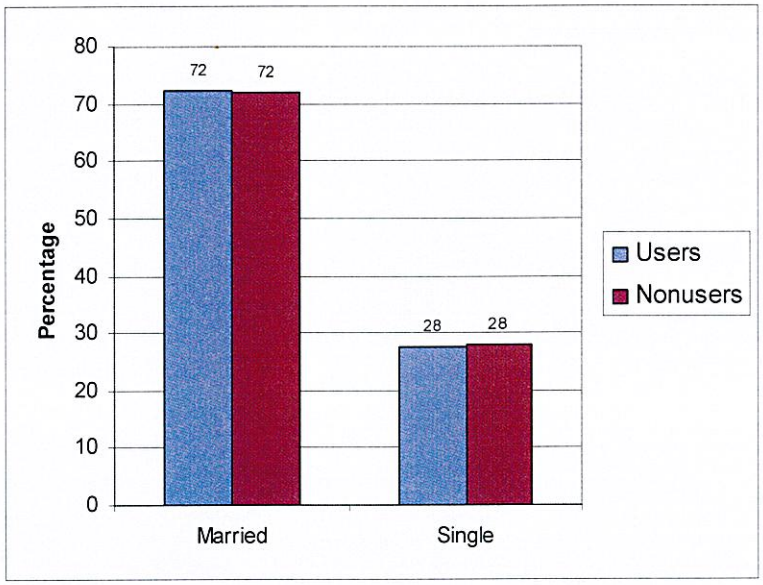


Figure 6.7: **Marital Status Distribution among Study Participants**

6.4.1.4 Profession

The occupation distribution of the study participants as depicted in Figure 6.8 shows that three categories of occupations dominated the study sample for both users and non-users. The majority of non-users were office workers (40%) while the majority of users were from the "Professionals" category (34%). This is consistent with age of the respondents as the majority of the sample came from the young and middle age group. However, these frequency distributions suggest that the occupation differences between the two segments of the sample hold some degree of significant influence on the adoption of online banking in Bahrain although the gap between the two segments for both categories is not substantial (office workers and professionals). On the other hand, the chi-square results for the Profession variable when comparing users to non-users proved to be significant (.002) (Please refer to Table 6.8)

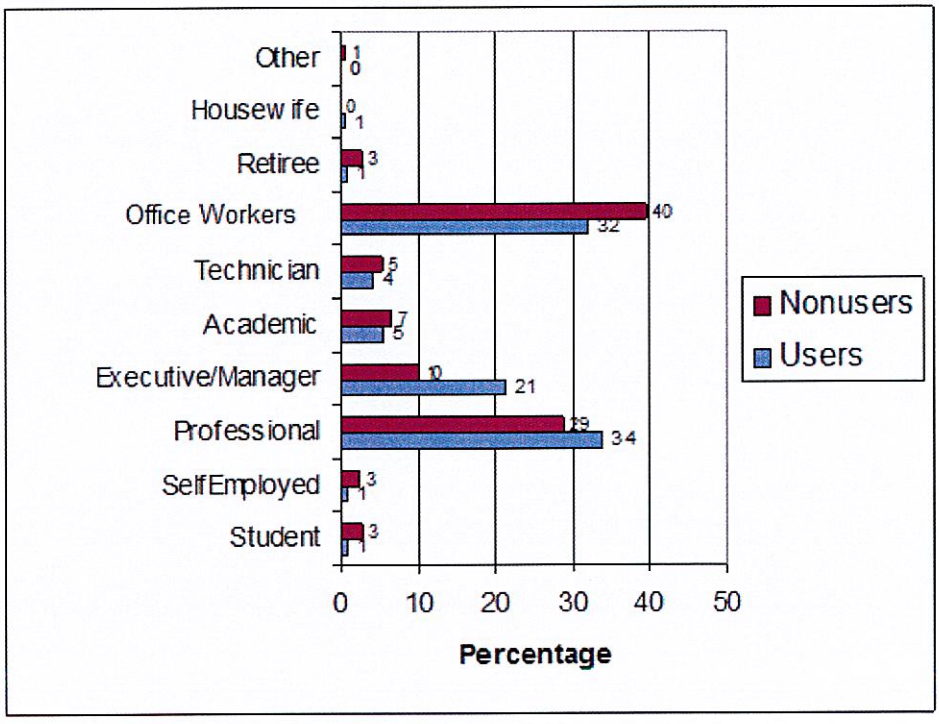


Figure 6.8: **Occupation Distribution among Study Participants**

6.4.1.5 Income

Figure 6.9 suggests that income seems to be a major demographic factor influencing the adoption of online banking in Bahrain. Thirty eight percent of the respondents earned above BD1000 a month (approximately 1300 sterling pounds) and almost half of online banking users are from this particular income category. It is also worthy to note that 28% of the non users category earn from BD401 – 601 which represents a lower end of the middle class income. Figure 6.9 depicting the differences in income between the two segments of the sample suggests that there is some relationship between the income of the user and the adoption of online banking. The majority of the users belong to the high income group (above BD1000) suggesting that the higher the income, the greater the probability of adoption of online banking.

The literature on technology-based services adoption confirmed that income is one of the drivers of usage (e.g. Choudrie and Dwivedi, 2005). In addition, Carveth and Kretchmer (2002) suggested that in the U.S.A., the higher the household income, the more likely the members of the household will own a computer and use the Internet, while Chinn and Fairlie (2004) confirmed the importance of per capita income in explaining the gap in computer and Internet use.

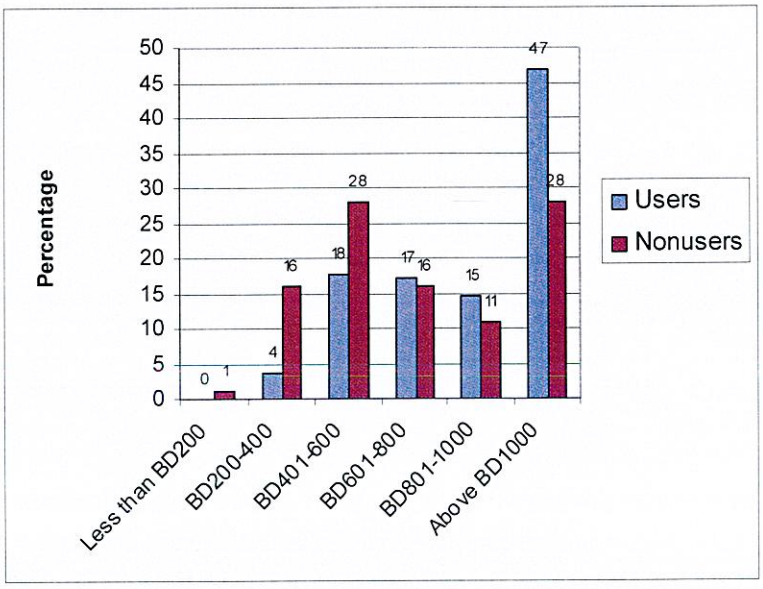


Figure 6.9: **Income Distribution among Study Participants**

In addition, the chi-square results for the Income variable when comparing users to non-users proved to be highly significant (.000) (Please refer to Table 6.8). Accordingly, these results confirm the importance of the income of the individual in affecting his/her decision to adopt and use online banking services in Bahrain.

6.4.1.6 Education

The education level of the respondents came mainly from two major categories both of which are of university/college education level. Users who had from 1-4 years of university/college education represented 44% of the users group while non-users represented the majority of that educational category (47%). Participants who had five years or more of university/college education ranked second for both users and non-users category (37% and 31%, respectively). The secondary school education category included more non-users than users. This result was expected as employees with very basic education levels would not be big earners and may not even have a personal computer or an Internet connection at home. Therefore, these results as depicted in Figure 6.10 indicate that although education has some influence on the decision to adopt online banking in Bahrain, this influence is not highly significant. In addition, the chi-square results for the Education variable when comparing users to non-users proved to be significant (.003) (Please refer to Table 6.8)

This finding was also shared by Venkatesh *et al.* (2000) who found that people with educational qualifications used computers more than less educated people. In addition, Rogers (2003) concluded that early adopters of self-service technologies have more years of formal education than do late adopters. In specific relevance to online banking, Akinci *et al.*, (2004) concluded that there is evidence that highly educated consumer group is more likely to adopt online banking.

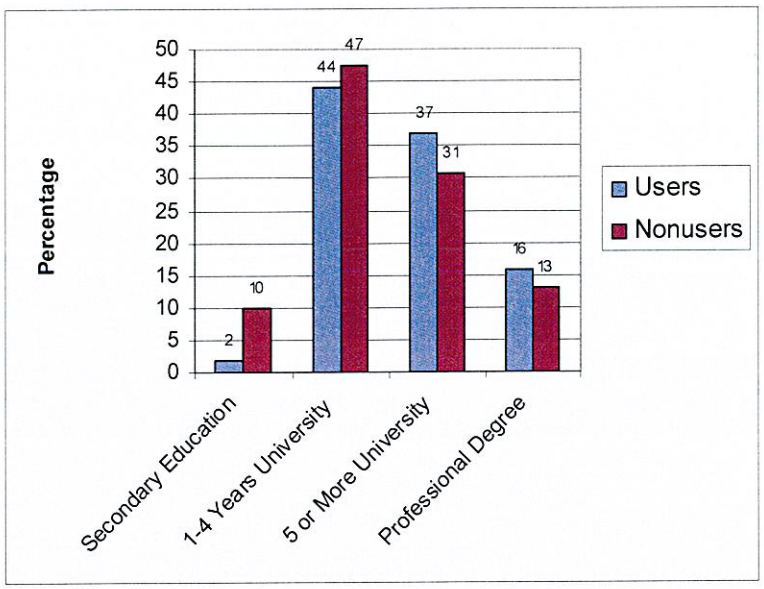


Figure 6.10: **Education Distribution among Study Participants**

6.4.2 *Summary of the Demographic Characteristics Influence on Online Banking Adoption*

The previous section described the demographics of the study sample which can help explain how these demographics can influence the adoption of online banking in Bahrain. It was found that the majority of online banking users were males (69.4%) which is in agreement with most previous studies in the field (see Chapter 2). The findings also indicate that the marital status, in terms of being single or married, does not have an influence on the adoption of online banking as both categories of male users and non-users scored equal percentages and the same is the case with the female users and non-users segments of the sample. The age group distribution for both users and non-users was close for young groups (25-29, 30-34 and 35-39) and the gap between them became more noticeable as the age increased. The least number of non-users was from the youngest group 18-24 years of age. This can also be explained as the young group is still in the beginning of establishing a career path and is too young to enjoy the amenities of experience and high salaries. The results obtained on both income and education implied that there are some effects of the level of the income and

education of the individual on online banking adoption, but with varying levels of significance: education was not as influential as income in the adoption decision process. Finally, it was also found that professions held by the current online users were mainly from the professionals' category (34%), office workers (32%) and executive and managerial positions (21%).

6.5 BANKING AND INTERNET USAGE INDIVIDUAL DIFFERENCES AMONG THE STUDY SAMPLE

This section presents the findings from the survey regarding the distribution of the study sample banking and Internet usage patterns.

6.5.1 *Personal Bank Distribution*

As the study population was selected on random basis, the participants presented a cross-sectional sample of customers of different banking institutions in Bahrain as presented in Table 6.3.

Table 6.3: **Study Sample Personal Banks**

Banking Institution	Number	Percentage
Bank of Bahrain and Kuwait (BBK)	240	42.1
National Bank of Bahrain (NBB)	153	26.8
Ahli United Bank (AUB)	42	7.4
Bahrain Islamic Bank (BIB)	33	5.8
Shamil Bank	31	5.4
Standard Chartered Bank (SCB)	28	4.8
Hong Kong Shanghai Banking Corporation (HSBC)	23	4.0
Kuwait Finance House (KFH)	6	1.1
Other	15	2.6
Total	571	100.0

Table 6.3 shows that the majority of the respondents are customers of BBK (42%) which is currently a leader in online banking in Bahrain. NBB follows with 26.8%, AUB with 7.4%, BIB with 5.8, Shamil Bank with 5.4%, SCB with 4.8%, HSBC with 4.0%, KFH with 1.1%, and other banks with 2.6%.

By comparing the personal banks of the two groups of the sample (users and non-users), Table 6.4 shows that two domestic commercial banks have the majority of the customers for each different category; NBB for non-users and BBK for users.

Table 6.4: **Users and Non-Users Personal Banks Comparison**

	NON-USERS		USERS		TOTAL	
BANK	N	%	N	%	N	%
AUB	21	7.84	21	6.93	42	7.36
BBK	46	17.16	194	64.03	240	42.03
BIB	29	10.82	4	1.32	33	5.78
HSBC	8	2.99	15	4.95	23	4.03
NBB	127	47.39	26	8.58	153	26.80
SCB	16	5.97	12	3.96	28	4.90
SHAMIL	13	4.85	18	5.94	31	5.43
KFH	4	1.49	2	0.66	6	1.05
OTHER	4	1.49	11	3.63	15	2.63
Total	268	100	303	100	571	100

When the above figures are plotted in a graph, Figure 6.11, it becomes clear to notice these differences in the personal bank choice for each category of customers.

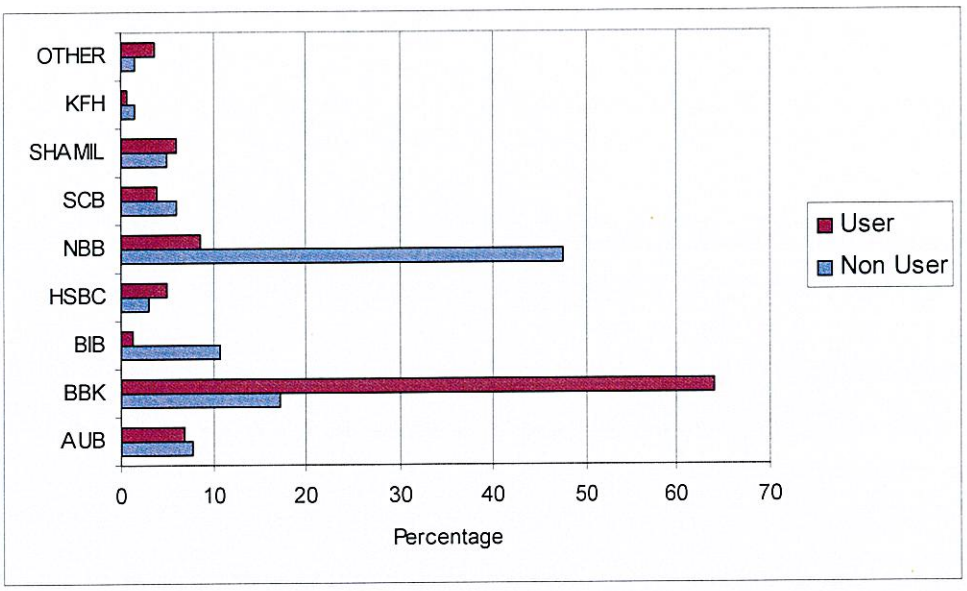


Figure 6.11: **Users and Non-Users Personal Banks Comparison**

The above graph shows us that the majority of the users (64%) are customers of Bank of Bahrain and Kuwait (BBK) and the majority of the non-users (47%) are customers of the National Bank of Bahrain (NBB). This can be explained as these two particular banks are among the top commercial banks in Bahrain and most of the public sector employees are their customers. In addition, NBB is the country's premier financial institution and the first Bahraini bank, which was founded in 1957 and rated highest among Bahraini commercial banks and in the top five regionally (NBBonline.com). Therefore, as an established bank, it is expected that their customer base is quite large. However, NBB still does not offer online banking services to its customers. Their services are limited to mobile banking, and ATM services. Accordingly, it is only natural that the segment of non-users who are customers of NBB is quite large as the opportunity to use online banking services is non-existent currently.

On the other hand, BBK is a pioneer of banking technology and information in Bahrain, and has taken initiatives in introducing innovative products and services to serve the customers better. Among all the banks in Bahrain, BBK

remains the commercial bank that offers a full, comprehensive electronic banking service.

6.6 PROFILE OF PARTICIPANTS' INTERNET USAGE BEHAVIOUR

Participants were asked a number of questions concerning their Internet access and usage behaviour.

6.6.1 *Length of Time Using the Internet*

When asked about the length of time the participants have been users of the Internet in general, there were very slight differences between the two groups of respondents. The majority of both users and non-users of online banking services have been users of the Internet for two or more years (86% and 81%, respectively).

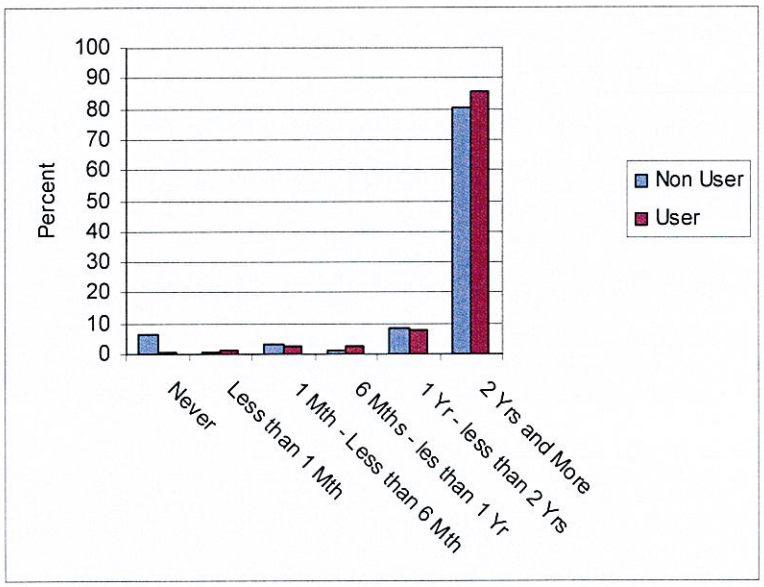


Figure 6.12: **Online Banking Users and Non-Users Length of Internet Use Comparison**

As the pattern of the time length of both users and non-users segments of the sample are closely related, this suggests that the length of time of Internet usage does not have a significant impact on the decision to use online banking

for our sample as both users and non-users are quite familiar and proficient with computers in general and the Internet in particular.

However, by considering the length of time of Internet usage for both users and non-users of online banking, it becomes apparent that there is a relationship between the choice of bank and online banking usage as the lack of such services is an obstacle to the adoption and not the Internet usage proficiency.

6.6.2 *Frequency of Internet Usage*

Respondents were asked to indicate the frequency with which they use the Internet on a weekly basis. More than half the participants (55.5%) use the Internet everyday of the week. Eighteen percent use the Internet 3-4 times a week, 11.7% use the Internet 5-6 times a week, and 11.4% use the Internet only 1-2 times a week.

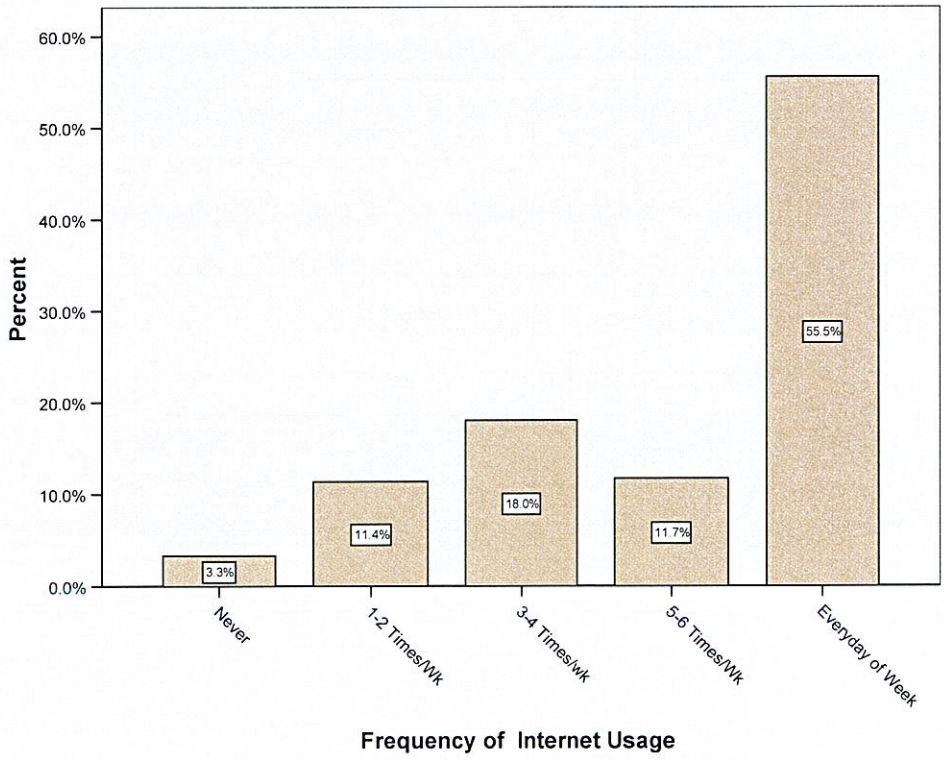


Figure 6.13: **Sample Frequency of Internet Usage per Week**

However, when comparing the frequency of Internet usage per week between the users and non-users of online banking, it is noticeable that users use the Internet more than non-users when compared on the everyday of the week category. There are slight differences between the two segments in the other four usage categories.

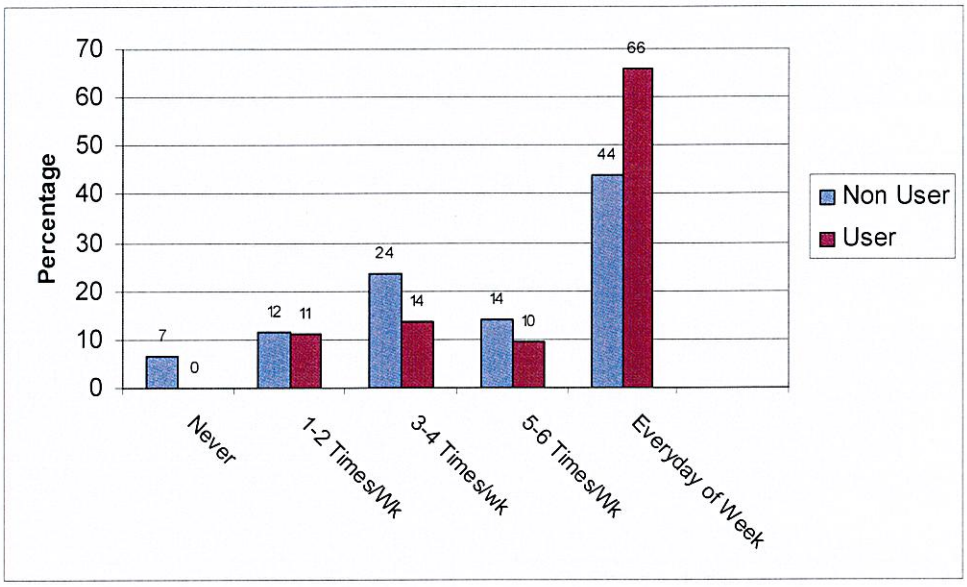


Figure 6.14: **Online Banking Users and Non-Users Frequency of Internet Usage Comparison**

Therefore, the differences in the two segments of the sample suggest that the frequency with which the sample participants use the Internet per week may have some indication of their willingness to use advanced technologies such as online banking services. As earlier studies confirmed the role of computer proficiency in the adoption process of technology-based services (Dabholkar and Bagozzi, 2002; Karjaluoto *et al.*, 2002b; Walker *et al.*, 2002), the tendency for future adoption of online banking in this instance is plausible.

6.6.3 *Place of Access*

The dominant place of access by the participants to the Internet was from home (70.9%). This was followed by workplace (24%), cyber café (1.2%) and school (0.5%).

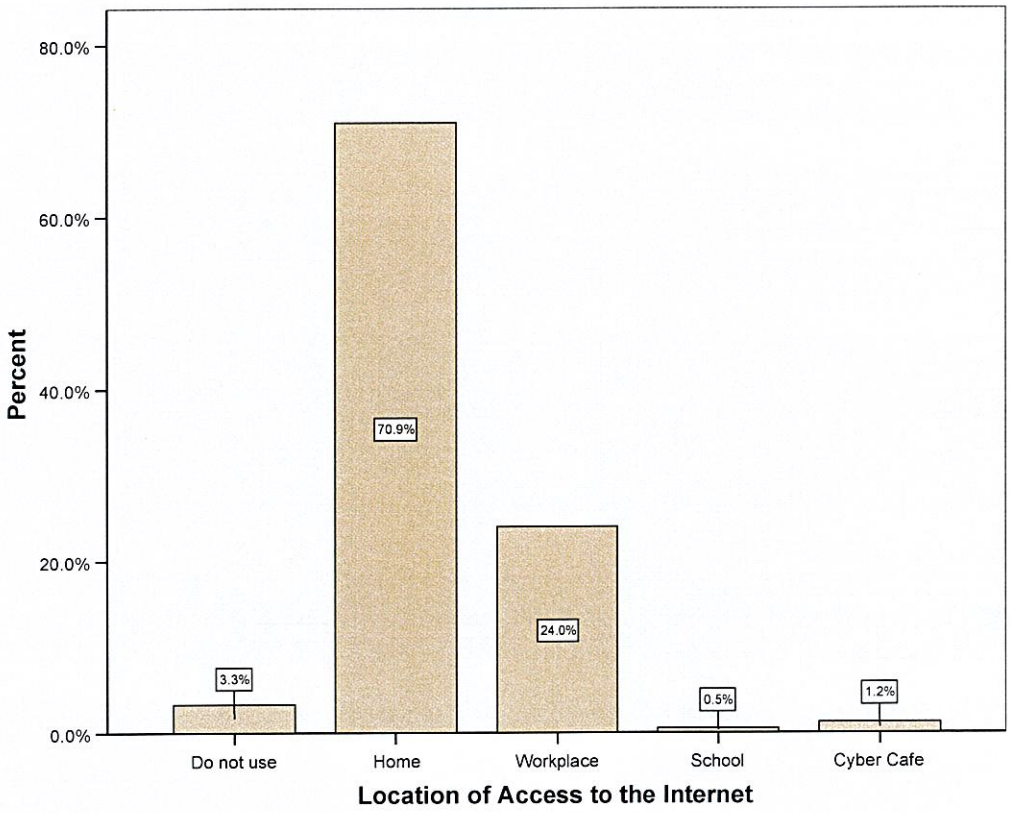


Figure 6.15: **Sample Location of Access to the Internet**

The above finding is consistent with the type of Internet usage among the sample. As the majority of the sample is users of online banking (53%) and due to the confidential nature of the banking services, it is only logical that most of these transactions are conducted at home. In addition, it is apparent that the workplace venue for usage of the Internet is mainly for work-related communication and business transactions.

6.6.4 *Speed of Internet Connection*

A total of 54.6% of the participants indicated that the Internet connection speed they use is moderate. Only 23.5% considered their connection speed to be fast while 3.5% found it to be very fast. However, 12.3% of the participants thought their Internet connection was slow and 2.6% found it to be very slow.

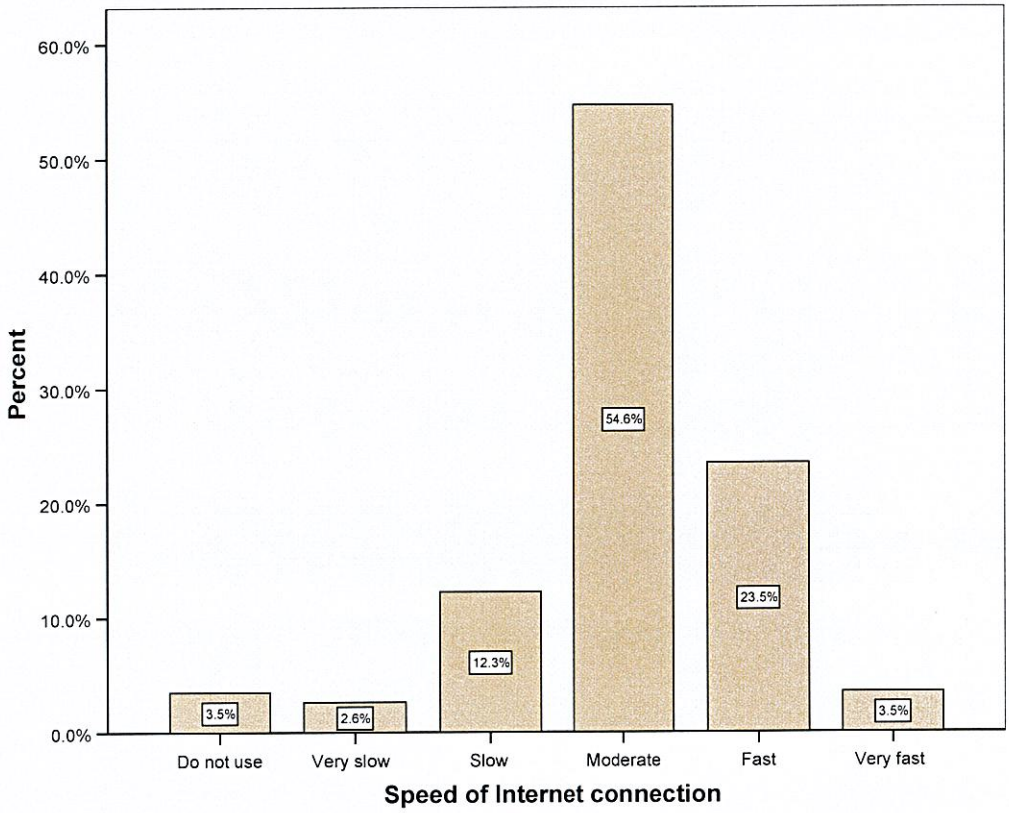


Figure 6.16: **Sample Perceptions Regarding the Speed of Internet Connection**

The current level of Internet services in Bahrain may be adequate for the current needs of the country but major improvements must be introduced to accommodate the new influx of expatriates. A world-class telecommunications infrastructure is a key enabler to growth in information technology. Although, the telecommunications infrastructure in Bahrain is comparable in certain features to global standards, yet there are many aspects that lag global standards such as the current limited bandwidth, the high prices, limitation of services as well as the current monopoly of service provider (ESCWA 2003).

6.6.5 *Internet Utilisation among Study Sample*

Respondents were presented with six choices for reasons why they use the Internet other than for banking and were asked to rate the extent to which they use the Internet for each particular choice. The rating varied from Always (1), Very often (2), Often (3), Sometimes (4), Rarely (5), Very Rarely (6) to Never (7).

Table 6.5: **Distribution of Internet Utilisation among Participants**

	Information Search	Communication	Free Software	Shopping	Work Search	Other
	%	%	%	%	%	%
Never	6.83	8.41	21.72	36.60	48.51	62.70
Very Rarely	5.25	4.03	15.94	17.69	15.59	7.88
Rarely	7.18	7.36	13.66	12.43	5.60	5.08
Sometimes	9.46	7.71	14.36	11.56	11.03	6.65
Often	13.84	11.03	12.08	10.16	6.65	5.08
Very Often	15.76	17.34	7.36	6.30	3.15	2.80
Always	41.68	44.13	14.89	5.25	9.46	9.81

The analysis of the Internet utilisation patterns among the study sample indicates that it is mainly used for communication and information search purposes in addition to downloading free software from the Internet. The "other" category included using the Internet to play games, make airline and hotel bookings, follow the news, pursue hobbies, study investment opportunities and to develop personal web sites.

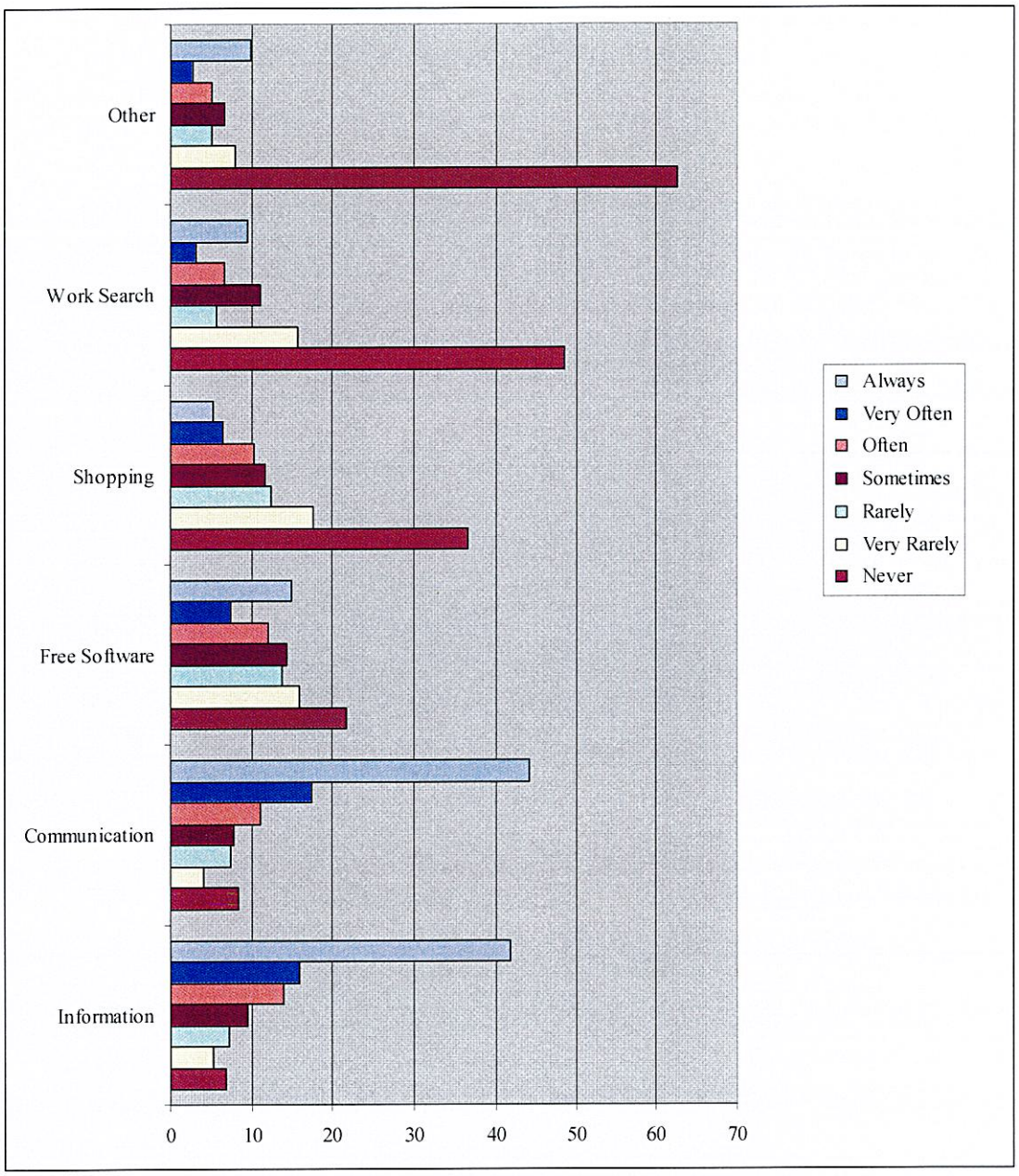


Figure 6.17: **Internet Utilisation among Study Sample**

6.6.6 *Summary of Banking and Internet Usage Individual Differences*

The previous section presented a summary of the sample's Internet usage behaviour and choice of personal bank. In addition, comparison was made between the users and non-users segments of the sample in an attempt to gain a better understanding of the differences which may lead to explain the role of individual differences in the technology adoption process.

As presented in Table 6.4, it was found that the majority of the users (64%) were customers of BBK which is a leader in online banking in Bahrain, while the majority of the non-users (47%) were customers of NBB which is a well-established domestic bank but does not offer online services at present. Most of the sample, both users and non-users of online banking, were connected to the Internet for 2 years or more (86% and 81%, respectively) which suggests that this duration did not have a significant impact on the adoption of online banking services. However, when participants were asked to indicate the frequency with which they use the Internet on a weekly basis, it was found that although the majority of the sample (55%) used the Internet every day of the week, and users secured a higher percentage than non-users (66% as compared to 44%, respectively). This suggests that this pattern may have some influence on the use of online banking services.

Home was found to be the location where the majority of the sample accessed the Internet from (71%), followed by the workplace (24%), while very few used the school or the cyber café as their points of access (0.5% and 1.2%, respectively). This confirms that due to the sensitivity of the banking transaction, the home seemed to be the most suitable point of access. Although cyber cafés are popular in Bahrain, the patrons of these places are mainly limited to the very young such as teenagers who are mainly students and are not expected to be online banking customers.

The majority of the sample (55%) conceded that the speed of the Internet connection offered by the sole Internet service provider in Bahrain, BATELCO, is moderate and these services are mainly used for information search and communication purposes.

6.7 ANOVA RESULTS ON INTERNET USAGE

In an attempt to better explain the Internet usage behaviour among the respondents, ANOVA by age is conducted. This test will help to determine if the model used in this study is significantly better at predicting the outcome than using the mean. The F-ratio will be the indicator of this improvement in prediction that results from fitting the model as compared to the inaccuracy that still exists in the model. The ANOVA test is the initial step which will help us identify the factors that are influencing the Internet usage behaviour. In addition, it will also facilitate finding answers for some of the research questions.

The Analysis of Variance (ANOVA) focuses on F-tests of significance of differences in group means, testing if the means of the groups formed by values of the independent variable (in this case the age of the respondent) are different enough not to have occurred by chance. If the group means do not differ significantly then it is inferred that age do not have an effect on the dependent variable Internet usage. The results will also help explain the decision to include the age variable as one of the individual differences that affects the intention to adopt online banking in the research model.

Table 6.6: **ANOVA by Age (Internet Usage Behaviour)**

Use	Age	N	Mean	S.d.	MS between Groups	F-Value	Sig.
Gathering information					**21.390**	**6.837**	**.000**
	18-24 years	75	6.00	1.443			
	25-29 years	118	5.75	1.760			
	30-34 years	105	5.35	2.166			
	35-39 years	83	5.07	1.846			
	40-44 years	89	5.12	1.724			
	Above 44	101	4.67	2.103			
Communi-cation					8.286	2.014	.077
	18-24 years	75	5.52	1.679			
	25-29 years	118	5.64	1.737			
	30-34 years	105	5.01	2.212			
	35-39 years	83	5.28	1.883			
	40-44 years	89	5.71	1.967			
	Above 44	101	5.12	2.169			
Free soft-ware					**30.554**	**7.604**	**.000**
	18-24 years	75	4.31	1.910			
	25-29 years	118	4.14	2.193			
	30-34 years	105	3.87	2.103			
	35-39 years	83	3.12	1.890			
	40-44 years	89	3.10	2.028			
	Above 44	101	3.04	1.928			
Shopping					**19.293**	**6.153**	**.000**
	18-24 years	75	3.52	1.848			
	25-29 years	118	3.09	1.974			
	30-34 years	105	2.90	1.926			
	35-39 years	83	2.25	1.568			
	40-44 years	89	2.79	1.892			
	Above 44	101	2.34	1.762			
Work search					**11.123**	**2.899**	**.014**
	18-24 years	75	3.19	2.103			
	25-29 years	118	2.63	2.075			
	30-34 years	105	2.78	2.043			
	35-39 years	83	2.16	1.707			
	40-44 years	89	2.56	2.153			
	Above 44	101	2.29	1.936			
Banking					1.518	1.630	.152
	18-24 years	75	1.81	1.193			
	25-29 years	118	1.90	1.016			
	30-34 years	105	1.76	0.946			
	35-39 years	83	1.73	0.766			
	40-44 years	89	2.08	1.003			
	Above 44	101	1.76	1.078			
Other					3.598	.912	.473
	18-24 years	75	2.27	2.022			
	25-29 years	118	2.43	2.134			
	30-34 years	105	2.57	2.143			
	35-39 years	83	2.33	2.073			
	40-44 years	89	2.18	2.135			
	Above 44	101	2.04	1.777			

The results displayed in Table 6.6 show significant differences in means between the age groups for each Internet usage category. However, in general young people use the Internet services more than the older groups. When looking at using the Internet for banking $F(565)= 1.630$, $p = 0.152$, communication $F(565) = 2.014$, $p = 0.077$, and other categories $F(565) = 0.912$, $p = 0.473$ were not statistically significant. Therefore, it seems that age does not have an impact on Internet banking, communication, and other categories of Internet usage.

In Appendix 3 a comprehensive table showing the ANOVA results by each particular age group in relation to the others for the internet usage categories. The post hoc results compare individual groups against each other to see if there are significant differences between the age groups' means. For instance, for the Internet usage for the purposes of gathering information there is significant differences between the 18-24 years, 25 – 29 years age group and those above 44 ($p = .001$, $p = .004$, respectively) while there is no significance between the other age groups. For the usage of the Internet for the purposes of downloading free software, there are significant differences between the 18-24 years of age and those of 35-39 years, 40 – 44 years and above 44 years categories ($p = .020$, $p = .014$, $p = .005$, respectively). In addition, those who fall in the 25 – 29 years of age have significant differences from those in the 35 – 39 years, 40 – 44 years and above 44 years groups ($p = .030$, $p = .021$, $p = .007$, respectively). And finally, the usage of the Internet for shopping purposes indicate significant differences between the young respondents of 18 – 24 years of age and those who are in the 35 – 39 years and above 44 years groups ($p = .003$, $p = .004$, respectively). Therefore, this confirms that age does play a significant role in the usage of the Internet by the respondents.

6.8 INDEPENDENT SAMPLES T-TESTS

Independent samples t-tests were carried out to compare the means among the categories of the sample (users and non-users). With this test it would be possible to look at the differences between the scores of each category. The t-test compares the means for two groups of cases and tests whether the differences in means of one variable between two groups of respondents is significantly different from zero.

Here a comparison of the mean ratings of the current users of online banking and the non-users on a number of factors such as Age, Education, Income, Attitude, External Influences, Subjective Norms, Perceived Behavioural Control, Perceived Ease of Use, Perceived Usefulness, Perceived Risk, Interpersonal Influences, Cultural Influences, Facilitating Conditions and Self Efficacy is made. It is not just whether there is a difference between the two segments means, but also if these differences are large enough to suggest that there are differences in the two population means that these samples represent. Such an understanding will help deduce what makes a group of people use online banking technologies while it does not work with another group.

Table 6.7 shows that the means and standard errors for Self Efficacy (SE), Perceived Risk (PR), Perceived Usefulness (PU), Perceived Ease of Use (PEU), Perceived Behavioural Control (PBC), Subjective Norms (SN), and Attitude (ATT) are all significantly different when comparing users to non-users of online banking ($p<.000$, $p<.01$ and $p<.05$).

Table 6.7: **Users and Non-Users Model Variables Mean Comparison**

Factor	Non Users			Users			P Value
	Mean	SD	SE	Mean	SD	SE	
Attitude	2.65	1.686	0.103	1.90	1.393	0.080	**.000**
Subjective Norms	3.021	.715	0.105	2.58	1.704	0.098	**.002**
Perceived Behavioural Control	5.41	1.638	0.100	5.86	1.416	0.081	**.001**
Perceived Ease of Use	4.98	1.220	0.074	5.57	1.065	0.061	**.000**
Perceived Usefulness	5.32	1.396	0.085	6.04	1.200	0.069	**.000**
Perceived Risk	4.20	1.358	0.083	4.92	1.375	0.079	**.000**
External Influences	5.10	1.303	0.080	4.99	1.052	0.060	.274
Interpersonal Influences	4.42	1.686	0.103	4.12	1.839	0.106	**.042**
Culture	4.34	1.539	0.094	4.22	1.607	0.092	.364
Facilitating Conditions	3.56	1.312	0.080	3.76	1.353	0.078	.081
Self Efficacy	4.91	1.480	0.090	5.67	1.221	0.070	**.000**

The significant results for Attitude, Subjective Norms, Perceived Behavioural Control, Perceived Ease of Use, Perceived Usefulness, Perceived Risk, Interpersonal Influences and Self Efficacy all indicate that it is more likely that there are significant differences between the users and non-users of online banking in Bahrain and that the differences are real particularly for those variables.

6.9 CHI-SQUARE ANALYSIS

To examine the relationship of the demographic variables between the two groups of respondents, i.e., users and non-users, chi-square tests were conducted. This helps to ascertain if the probability that the observed

relationship between the demographic variables and the adoption variable is a matter of coincidence or not.

Each variable of the demographic profile was used individually to determine the significance of the chi-square test results. Table 6.8 depicts the results of this analysis with the significance level noted. Only four demographic variables are significant: age and education, profession at $p<0.05$ and income at a higher significance level of .000.

However, it is worthy to note that the chi-square is usually not a strong statistic in that it does not convey information about the strength of the relation as a large chi-square value and a corresponding strong significance cannot be taken to mean a closer relationship between two variables than when chi-square is considerably smaller but moderately significant (Bryman and Cramer, 2005, p.212). It only conveys that there is a relationship between the two variables.

Table 6.8: **Segmented Sample Demographic Characteristics Chi Square Results**

Rated Demographic Variable	Users %	Non-users %	Chi-Square	Sig.
Gender			3.409	.065
Male	55.8	44.2		
Female	47.7	52.3		
Marital Status			0.005	.944
Married	53.2	46.8		
Single	52.8	47.2		
Age*			**11.142**	**0.049**
18-24 Years	42.7	57.3		
25-29 Years	57.6	42.4		
30-34 Years	51.4	48.6		
35-39 Years	55.4	44.6		
40-44 Years	64.0	36.0		
Above 44 Years	45.5	54.5		
Education**			**13.910**	**.003**
Secondary School	25.0	75.0		
1-4 Years University	51.9	48.1		
5 + Years University	57.7	42.3		
Professional Degrees	57.8	42.2		
Profession**			**25.901**	**.002**
Student	27.3	72.7		
Self-employed	30.0	70.0		
Professional	57.2	42.8		
Executive/Manager	70.3	29.7		
Academic	47.1	52.9		
Technician	46.2	53.8		
Office Worker	47.8	52.2		
Retiree	27.3	72.7		
Housewife	66.7	33.3		
Other	0.0	100.0		
Income***			**48.038**	**.000**
Less than BD200	0.0	100.0		
BD200-400	20.4	79.6		
BD401-600	41.9	58.1		
BD601-800	54.7	45.3		
BD801-1000	60.3	39.7		
Above BD1000	65.4	34.6		

*p<.05
**p<.01
***p<.001

6.10 CORRELATIONS

Pearson correlations were conducted on the different variables of the model and their two-tailed significance was recorded. Correlations varied from weak to moderate according to the rule specified by Fink (1995). The following table shows these guidelines.

Table 6.9: **Correlation Guidelines**
(Source: Fink, 1995, p. 36)

Correlation	Description
0 to +(-) 0.25	Little or no relationship
+(-) 0.26 to +(-) 0.50	Fair degree of relationship
+(-) 0.51 to +(-) 0.75	Moderate to good relationship
Over +(-) 0.75	Very good to excellent relationship

The correlations affecting each dependent variable are analysed and discussed individually.[1]

6.10.1 *Attitude*

Table 6.10 shows the correlations affecting the attitude dependent variable. The relationships varied from negative weak to positive moderate. Gender showed no significant relationship on attitude (0.055, p=0.193). Age has a weak significant negative relationship on attitudes (-0.105, p=0.012) which is in agreement with the Internet research studies which claim that the younger the age of the internet user, the more positive the attitude (see Chapter 2). Analysis shows that there is no significant relationship between education and attitude (0.072, p=0.084). However, both perceived ease of use (PEU) and perceived useful (PU) display a fair degree of positive correlation with attitude (.322, p=0.000 and .400, p=0.000, respectively). This again is in agreement with research findings on attitudes toward the adoption of new

[1] A complete correlation matrix (Appendix 3) was derived but is not presented here

technological services as presented in the Literature Review Chapter. Culture was found to have no significant relationship to attitude (0.040, p=0.336). Past research studies on culture and its impact on attitudes when adopting new technologies presented differing results. While some studies indicated the existence of a correlation between these two, others failed to do so (see Chapter 2).

Table 6.10: **Correlations Analysis of Dependent Variable Attitude (ATT)**

		GEN	AGE	INC	EDU	ATT	PEU	PU	PR
AGE	Pearson Correlation	**-.309(**)**							
	Sig. (2-tailed)	**.000**							
INC	Pearson Correlation	**-.333(**)**	**.434(**)**						
	Sig. (2-tailed)	**.000**	**.000**						
EDU	Pearson Correlation	**-.198(**)**	.009	**.305(**)**					
	Sig. (2-tailed)	**.000**	.830	**.000**					
ATT	Pearson Correlation	.055	**-.105(*)**	**.159(**)**	.072				
	Sig. (2-tailed)	.193	**.012**	**.000**	.084				
PEU	Pearson Correlation	**-.094(*)**	.025	**.088(*)**	.036	**.322(**)**			
	Sig. (2-tailed)	**.025**	.548	**.036**	.385	**.000**			
PU	Pearson Correlation	**-.101(*)**	-.066	**.126(**)**	.061	**.400(**)**	**.628(**)**		
	Sig. (2-tailed)	**.016**	.113	**.003**	.148	**.000**	**.000**		
PR	Pearson Correlation	-.042	-.027	-.040	**-.097(*)**	**.176(**)**	**.503(**)**	**.471(**)**	
	Sig. (2-tailed)	.314	.512	.345	**.021**	**.000**	**.000**	**.000**	
CUL	Pearson Correlation	-.011	-.018	**-.177(**)**	**-.134(**)**	.040	**.210(**)**	**.217(**)**	**.334(**)**
	Sig. (2-tailed)	.800	.676	**.000**	**.001**	.336	**.000**	**.000**	**.000**
	N	571	571	571	571	571	571	571	571

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

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

KEY

AGE = Age
ATT = Attitude
GEN = Gender
CUL = Culture
EDU = Education
INC = Income
PEU = Perceived Ease of Use
PU = Perceived Usefulness
PR = Perceived Risk

It was interesting to find that there is a weak positive correlation between perceived risk and attitude (0.176, p=000) which although weak but seems out of place. Logic dictates that the more risk there is in taking a specific action the more negative the attitude will be. However, this does not seem to be the case here.

6.10.2 *Subjective Norms*

The second dependant variable in the research model, subjective norms (SN) has two independent variables affecting it, external influences (EXTI) represented by media and bank promotion and interpersonal influences (INTI) represented by peer induced influences. Correlation results show that interpersonal influences have a weak significant positive correlation on subjective norms (0.250, p=0.000) while external influences do not have a significant correlation with subjective norms (0.057, p=0.173).

Table 6.11: **Correlations Analysis of Dependent Variable Subjective Norms (SN)**

		SN	EXTI
EXTI	Pearson Correlation	.057	
	Sig. (2-tailed)	.173	
INTI	Pearson Correlation	**.250(**)**	**.210(**)**
	Sig. (2-tailed)	**.000**	**.000**
	N	571	571

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

KEY
SN = Subjective Norms
EXTI = External Influences
INTI = Internal Influences

6.10.3 *Perceived Behavioural Control*

Perceived behavioural control (PBC) was assumed to be influenced by two independent variables, namely facilitating condition (FC) and self efficacy (SE). The correlation analysis indicates the existence of a moderate positive correlation between SE and PBC (0.468, p=0.000) and a weak positive correlation between FC and PBC (0.172, p=0.000).

Table 6.12: **Correlations Analysis of Dependant Variable Perceived Behavioural Control (PBC)**

		PBC	SE	FC
SE	Pearson Correlation	**.468(**)**		
	Sig. (2-tailed)	**.000**		
FC	Pearson Correlation	**.172(**)**	**.119(**)**	
	Sig. (2-tailed)	**.000**	**.004**	
	N	571	571	571

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

KEY
PBC = Perceived Behavioural Control
SE = Self Efficacy
FC = Facilitating Conditions

6.10.4 *Behavioural Intention*

The final part of the model consists of the original form of the Theory of Planned Behaviour (Ajzen, 1975) with attitude (ATT), subjective norms (SN) and perceived behavioural control (PBC) exerting influences on the behavioural intention (BI) (see Chapter 2). The correlation analysis indicates that there is significant positive weak correlation between attitude and the behavioural intention which is supported by the adoption and attitude literature. The same type of correlation also exists between perceived behavioural control and the behavioural intention which is also supported by technology adoption research literature. However, a significant negative

weak correlation exists between the subjective norms and the behavioural intention. This finding does not seem to be in agreement with research on technology adoption as specified in the literature as some earlier research found that subjective norms do exert some influence on the behavioural intention to adopt a new technology-based innovation (see Chapter 2).

Table 6.13: **Correlations Analysis of Dependant Variable Behavioural Intention (BI)**

		ATT	SN	PBC
SN	Pearson Correlation	**-.187(**)**		
	Sig. (2-tailed)	**.000**		
PBC	Pearson Correlation	**.274(**)**	**-.145(**)**	
	Sig. (2-tailed)	**.000**	**.000**	
BI	Pearson Correlation	**.275(**)**	**-.128(**)**	**.261(**)**
	Sig. (2-tailed)	**.000**	**.002**	**.000**
	N	571	571	571

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

KEY
ATT = Attitude
BI = Behavioural Intention
PBC = Perceived Behavioural Control
SN = Subjective Norms

The overall significance levels of the variables as displayed in the above table are quite weak which subsequently does not help in providing a solid contribution in explaining the formation of the behavioural intention of the respondents.

6.11 FURTHER SEGMENTATION OF RESPONDENTS

Three segments of respondents are identified: current users, non-users who are likely to adopt online banking (potential users) and non-users who are not likely to adopt online banking within the next 18 months (persistent non-

users). This classification was introduced following the responses to question number 9 in the survey distributed (Appendix 2) which asked respondents: "Suppose that online banking services were available to you, how likely would you be to become a regular user?"

The first category was derived by selecting those who already adopted online banking as current users. Respondents who expressed an intention to use online banking within the next 18 months and selected "very likely" (7) to "somewhat likely" (5) are classified as potential users while persistent non-users were those respondents who stated that they were not likely to adopt online banking within the next 18 months and answered "very unlikely (1) to "somewhat unlikely" (3). Respondents who expressed that they were neither likely nor unlikely to adopt online banking in the next 18 months and selected (4) on the 7-Likert scale were excluded from further analysis.

Accordingly, the result was as follows:

303 as current users,
147 as potential users, and
72 as persistent non-users.

Respondents were then classified and coded as follows:

1 = Current users
2 = Potential users
0 = Persistent non-users

The following table presents the demographic information of respondents for the three segments of respondents: current users, potential users and persistent non-users.

Table 6.14: **Profile of the Segmented Sample**

Variable	Users		Potential Users		Persistent Non-users		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gender								
Male	211	69.9	92	62.6	45	62.5	348	66.67
Female	92	30.4	55	37.4	27	37.5	174	33.33
Total	303		147		72		522	100
Age								
18 – 24 years	32	10.6	23	15.6	12	16.7	67	12.84
25 – 29 years	68	22.4	28	19.0	11	15.3	107	20.50
30 – 34 years	54	17.8	29	19.7	16	22.2	99	18.96
35 – 39 years	46	15.2	21	14.3	10	13.9	77	14.75
40 – 44 years	57	18.8	20	13.6	4	5.6	81	15.52
Above 44 years	46	15.2	26	17.7	19	26.4	91	17.43
Total	303		147		72		522	100
Profession								
Student	3	1.0	3	2.0	5	6.9	11	2.11
Self-employed	3	1.0	2	1.4	5	6.9	10	1.92
Professional	103	34.0	43	29.3	15	20.8	161	30.84
Executive/Manager	64	21.1	16	10.9	7	9.7	87	16.67
Academic	16	5.3	12	8.2	3	4.2	31	5.94
Technician	12	4.0	11	7.5	2	2.8	25	4.79
Office worker	97	32.0	52	35.4	33	45.8	182	34.86
Retiree	3	1.0	6	4.1	2	2.8	11	2.11
Housewife	2	0.7	1	0.7	0	0	3	0.57
Other	0	0	1	0.7	0	0	1	0.19
Total							522	100
Monthly Income								
Less than BD200	0	0	2	1.4	1	1.4	3	0.57
200 – 400	11	3.6	19	12.9	19	26.4	49	9.39
401 – 600	54	17.8	40	27.2	18	25.0	112	21.45
601 – 800	52	17.2	23	15.6	13	18.1	88	16.86
801 – 1000	44	14.5	16	10.9	8	11.1	68	13.03
Above 1000	142	46.9	47	32.0	13	18.1	202	38.70
Total							522	100
Education								
Primary School	0	0	0	0	0	0	0	0
Intermediate School	0	0	0	0	0	0	0	0
Secondary School	9	3.0	10	6.8	11	15.3	30	5.75
1 – 4 years university	134	44.2	73	49.7	34	47.2	241	46.17
5+ years university	112	37.0	39	26.5	24	33.3	175	33.52
Professional Degree	48	15.8	25	17.0	3	4.2	76	14.56
							522	100

6.12 SUMMARY

This chapter presented the analysis results for the data collected from the respondents. A questionnaire was prepared and distributed to participants by mail and in person to both public and private establishments in Bahrain. The

response rate for this survey was 38% (571 usable questionnaires were utilised out of 1500 distributed). The reliability test of the questionnaire variables confirmed that non-response bias was not an issue.

Analysis of the demographic profile of the respondents together with a comparison between users and non-users of online banking highlighted the differences between the two segments of the study population. It also helped explain the characteristics of the typical online banking user in Bahrain which could be beneficial for banks to identify and concentrate their marketing strategies on convincing the non-users segment to adopt online banking.

The data analysis continues in the next chapter with the data modelling process where hypotheses are tested and the possibility of future online banking adoption predicted.

The ANOVA, t-tests and chi-square analyses helped identify the variables which are more logical for the next stage, i.e., data modelling which follows in the next chapter. The individual differences of the respondents represented by age, and income were found to be of significance and should be further investigated. In addition, the t-tests emphasised the importance of self efficacy, perceived risk, perceived usefulness, perceived ease of use, perceived behavioural control, subjective norms and attitude variables. The data modelling stage will further analyse the influence of these variables on the model under study.

CHAPTER 7

DATA MODELLING

7.1 INTRODUCTION

This chapter utilises the data collected from the questionnaire into building the research model to answer some of the research questions. The chapter starts with a binary logistic regression test which is used to predict a dichotomous variable among the current non-users of online banking (may use online banking/may not use online banking) in an attempt to answer the sixth research question stated at the beginning of this thesis. A comparison of the results of the binary logistic regression for users and non-users with those of potential users and persistent non-users is also made to highlight the differences in the predicting variables for each segment of the sample. Then, path analysis is used to test the hypotheses generated in Chapter 4 and results are discussed. A comparison of predicted and actual hypotheses results is also presented and the chapter concludes with a summary of all the above results.

7.2 BINARY LOGISTIC REGRESSION

Although many previous studies on online technology adoption have taken a dichotomous view of users versus non-users (see Chapter 2), in this section the results of this research will help predict prospective adopters from the current non-users segment of the sample.

A logistic regression to predict the percentage of current non-users who may adopt online banking in the next 18 months and those who may not is

conducted. The results of this regression will help answer the sixth research question:

"Can behavioural intention predict future online banking adoption for the current non-users sample participants?"

7.2.1 *Criterion Variable*

The respondents' decision about future adoption or non-adoption of online banking is used in this analysis as the dichotomous criterion variable as follows:

Decision to adopt online banking in the future is coded here with
0 = "Not adopt", and
1 = "Adopt".

7.2.2 *The Predictor Variables*

In Chapter 6, several non-parametric statistical tests were conducted such as ANOVA, t-tests and the Chi-square tests. The subsequent non-parametric results produced a number of variables that proved to be of significance. Therefore, those variables will be utilised here to further investigate online banking adoption in Bahrain and which may help explain their influence on the intention to adopt.

Variables that were used as the predictor variables to evaluate the chances that current non-users may consider when it comes to future decisions about adoption of online banking services were categorised into six main categories. From the demographics category, income and education were two factors considered under the demographics profile of non-users to predict future adoption. Two other categories which are major players in the Theory of Planned Behaviour, namely, attitudes and subjective norms have also been

considered. Self efficacy and facilitating conditions are two categories that were included. In addition, due to the nature of the banking environment and sensitivity of banking transactions, the researcher deemed it necessary to include another category reflecting the security aspects of transacting online as an influential variable in the decision to adopt online banking.

7.2.2.1 Attitude

Research has shown that use of technology-based services may be influenced by a combination of consumer traits and attitudes which in turn will affect the willingness of the customers to use these services (Azjen and Fishbein, 1980; Dabholkar, 1996; Curran *et al.*, 2003; Meuter *et al.*, 2003;). Attitudes in turn are influenced by external and internal variables that affect the decision making process. Therefore, this construct is included due to its importance in the prediction of adoption as cited in the literature. Respondents were asked to express their views about how they perceive online banking in terms of: bad idea - good idea; foolish decision – wise decision; unfavourable – favourable; and unbeneficial – beneficial. The responses were ranked on a seven-point Likert scale.

7.2.2.2 Subjective Norms

As the sample under study comes from a traditional, collective culture, it was necessary to consider the impact of the circle of people with whom the customer interacts. Therefore, and in line with the literature which emphasised that one of the factors that influences technology adoption is the extent of the importance of personal contact as seen by the individual (e.g. Dabholkar and Bagozzi, 2002; Walker, *et al.,* 2002), subjective norms variable is included. Accordingly, respondents were asked to rate three statements that measure the influence of three groups of people on them when making their decisions about the adoption of online banking whether currently or in the future. These three groups are: friends, family and colleagues/peers.

The responses were rated on a seven point Likert scale with (1) indicating strong disagreement with the statement and (7) on the other end indicating strong agreement with the statement.

7.2.2.3 Self Efficacy

Research has shown that self confidence of the technology user represented by his self efficacy can impact the adoption or rejection of technology-based innovations (e.g. Agarwal and Karahanna, 2000; Dabholkar and Bagozzi, 2002; Walker *et al.*, 2002; Meuter *et al.*, 2003). Accordingly, this variable is considered in the prediction of future adoption of online banking in Bahrain. The consumers' perception of their self efficacy in an online banking environment was measured with five statements investigating if the customer was: able to use the Internet without help from others, confident of using online banking even for the first time, confident of using online banking with online instructions only for help; confident he/she has the necessary knowledge and skills needed to use online banking and considered himself/herself as an experienced Internet user. Responses were rated on a seven point Likert scale with (1) indicating strong disagreement with the statement and (7) on the other end indicating strong agreement with the statement.

7.2.2.4 Facilitating Conditions

Online banking necessitates the availability of a sound technical infrastructure support in addition to government support to provide a trust-worthy medium to enable customers to transact confidently. The perception of the individual of the reliability of using such as services and the security associated with it have been proved to be of significance in the literature (e.g. Bitner, 2001; Jun and Cai, 2001). Therefore, customers were presented with six statements that measured their agreement with issues relating to their confidence in the Central Bank of Bahrain (CBB) as a sound regulating controller of online

banking, problems with the Internet provider services in addition to its degree of reliability and costs. In addition, government support of electronic commerce was also evaluated. Responses were rated on a seven point Likert scale with (1) indicating strong disagreement with the statement and (7) on the other end indicating strong agreement with the statement.

7.2.2.5 Security

As literature emphasised that security of online banking is a big concern for banking customers in general (e.g. De Ruyter *et al.*, 2000; Polatoglu and Ekin, 2001; Walker *et al.*, 2002; Curran *et al.*, 2003; Meuter *et al.*, 2003), respondents were asked to evaluate the significance of perceived risk in terms of (1) confidence in security aspects of online banking in Bahrain, (2) trust in their bank taking appropriate action to settle any wrong transactions, (3) personal information being kept confidential; and (4) their confidence that advances in Internet security technology provides for a safer online banking environment. Each of the responses was rated on a seven point Likert scale with (1) indicating strong disagreement with the statement and (7) on the other end indicating strong agreement with the statement.

7.2.3 *Analysis and Results of Binary Logistic Regression*

In order to predict the logit, which is the natural log of the odds of having made one or the other decision of adopting or not adopting online banking for the category of current non-users, the model applied is:

$$\ln(\text{ODDS}) = \ln\left[\frac{P}{1-P}\right]$$

Where P is the predicted probability of adoption
1- P is the predicted probability of non-adoption

Here, we present the method employed in this research which is designed to investigate how the adopter categories can be identified with regard to the

selective adoption factors presented in the binary regression test. Two customer segments are identified (persistent non-adopters who are not likely to adopt online banking within the next 18 months and potential adopters who are likely to adopt online banking within the next 18 months).

It is assumed that there is a non-linear relationship between the variables explained earlier and which are listed in binary regression model and the probability that adoption will be chosen by the current non-users of online banking. This relationship should conform approximately to a logistic curve since it implies that the probability of adoption being chosen never actually reaches 1, however high the expected utility of using Internet banking actually is. This relationship is relevant to the view that economic functions are not deterministic.

The first step in the binary logistic regression was identifying the variables to be included in the analysis. As online banking in Bahrain is comparatively a new technology, a number of variables were considered to predict the intention to adopt among the sample respondents. Those variables were identified with the help of the literature and previous studies in the field of technology adoption. This was followed by a factor analysis in order to reduce the number of variables to be included. Factors analysis produced Table 7.1 which reduced the number of variables initially used.

Table 7.1: **Factor Analysis Rotated Component Matrix (Potential Users/Persistent non-users)**

	Component					
	1	2	3	4	5	6
SELF EFFICACY						
Owns necessary knowledge and skills to use services	.865					
Confidence of using online banking even if first time	.857					
Experienced Internet user	.824					
Ability to use Internet without help of others	.815					
Confidence of using online banking only with instructions	.755					
BMA as sound controller of online banking	473				.397	
ATTITUDE						
Wise - foolish		.937				
Favourable - unfavourable		.918				
Beneficial - Unbeneficial		.907				
Good idea - bad idea		.904				
SECURITY						
Personal information safe			.843			
Bank will compensate errors caused by security flaws			.785			
Confidence over security of online banking			.769			
Bank will take appropriate action to settle any wrong			.705			
Advances in security make online banking safe	.512		.515			
SUBJECTIVE NORMS						
Decision influenced by friends				.919		
Decision influence by colleagues/peers				.916		
Decision influenced by family				.813		
FACILITATING CONDITIONS						
Govt of Bahrain active setting up facilities for e-commerce					.866	
Govt of Bahrain promotes e-commerce					.837	
Costs of connection of Internet reasonable						.505
BATELCO services advanced and reliable						.902
No problems with BATELCO services						.823

Table 7.1 indicates that five categories are identified for the binary logistic regression tests. These categories are self efficacy, attitudes, security, subjective norms, and facilitating conditions. The last category has been divided into two components (variables relating to the government and to the telecommunications infrastructure). In addition, the cumulative percentage of

variance accounted for by the factors considered in the factor analysis test for potential users and persistent non-users in the sample is equal to 73.94%.

The Kaiser-Meyer-Olkin measure of sampling adequacy is .831 (Table 7.2). As this is close to 1, then it indicates that the patterns of the correlations are relatively compact and so factor analysis should yield distinct and reliable factors (Kaiser, 1974).

Table 7.2: **KMO and Bartlett's Test (Potential Users/Persistent Non-Users)**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.831
Bartlett's Test of Sphericity	Approx. Chi-Square	8329.558
	df	253
	Sig.	.000

The binary logistic regression test will be the next step after identifying the variables to be included. This test will be conducted first among potential users and persistent non-users. Table 7.3 summarises the results of this test highlighting variables of significance.

Table 7.3: **Binary Logistic Regression Variables (Potential Users/Persistent non-users)**

	B	S.E.	Sig.	Exp(B)
Constant	.453	.617	.463	1.573
INCOME	-1.221	.581	**.036**	.295
EDUCATION	2.676	.876	**.002**	14.528
Self Efficacy	.489	.170	**.004**	1.630
Attitude	.467	.173	**.007**	1.595
Security	.310	.170	.068	1.364
Subjective Norms	.429	.178	**.016**	1.536
Facilitating Conditions - Government	-.363	.183	**.048**	.696
Facilitating Conditions - Infrastructure	.296	.171	.083	1.345

From the above logistic regression table, it is evident that the majority of the factors included in the logistic regression play significant roles in the prediction of the future adoption among the current non-users of online

banking segment in Bahrain. However, the security aspects as well as facilitating conditions represented by the telecommunications structure did not indicate that their influences in the prediction are significant.

The following table summarises the fitness of the model which contains the two pseudo R square measures – Cox and Snell and Nagelkerke. It is usually better to look at Nagelkerke's measure as this divides Cox and Snell by the maximum to give a measure that really does range between zero and one (Foster *et al.*, 2006).. In this case, the model explains more than 20% of the variance in the dependent variable for potential users and persistent non-users of online banking in Bahrain.

Table: 7.4: **Model Summary (Potential Users/Persistent non-users)**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
226.053[(a)]	.209	.291

a Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

The Hosmer and Lemeshow Goodness-of-Fit test divides the subjects into deciles based on predicted probabilities, and then computes a chi-square from observed and expected frequencies. The p-value=0.297 for the second model here is computed from the chi-square distribution (9.558) with 8 degrees of freedom and indicates that the logistic model is a good fit. The idea behind the Hosmer and Lemeshow's goodness-of-fit test is that the predicted frequency and observed frequency should match closely, and that the more closely they match, the better the fit. The Hosmer-Lemeshow goodness-of-fit statistic is computed as the Pearson chi-square from the contingency table of observed frequencies and expected frequencies. Similar to a test of association of a two-way table, a good fit as measured by Hosmer and Lemeshow's test will yield a large p-value.

Table 7.5: **Classification Table (Potential Users/Persistent non-users)**

Observed		Predicted		
		DECISION		Percentage Correct
		Not Adopt	May Adopt	
DECISION	Not Adopt	32	40	44.4
	May Adopt	17	130	88.4
Overall Percentage				74.0

The cut value is .500

The above classification table follows the rule set by SPSS which is the decision rule of "if the probability of the event is greater than or equal to the threshold of 0.5, it could be predicted that the event, which is in this case the adoption of online banking, will take place." Therefore this classification table shows that this rule allows us to correctly classify 130/147 = 88% of the subjects where the predicted event of adopting online banking was observed. In addition, this rule allows us to correctly classify 32/72 = 44% of the subjects where the predicted event of adopting online banking is not observed. Overall the predictions are correct 162 times out of 219, with an overall success rate of 74%.

The demographic variables of income and education, attitudes, self efficacy, influence of subjective norms, as well as facilitating condition among current non-users proved to be of importance in the prediction of future adoption among this group of bank customers. Those finding are in agreement with the literature as demographics, attitudes, self efficacy and subjective norms are influential in the online services adoption decision-making process (see Chapter 2).

When comparing these results with those obtained from the non-parametric results, some consistency is apparent. For example, the non-parametric results indicate the significance of the subjective norms while age did not prove to be of any significance in the predicted adoption decision process.

A final step in the binary logistic regression was conducting the test on the whole sample and comparing users and non-users to highlight the predicting variables between these two segments. This step will help identify the similarities and differences in the predicting variables for each segment of the sample, namely, users, non-users in general, persistent non-users and potential users.

A factor analysis test was run first to determine the variable categories to be included in this logistic regression and table 7.6 presents the rotated component matrix for the whole sample. Six main categories were identified, namely, Attitudes Self Efficacy, Security, Subjective Norms, and Facilitating Conditions which were sub-categorised into factors relating to the government and others to the telecommunications infrastructure.

In addition, Table 7.7 shows the results of the binary logistic regression for the whole sample (users and non-users).

Table 7.6: **Factor Analysis Rotated Matrix (Users/Non-users)**

	Component					
	1	2	3	4	5	6
SELF EFFICACY						
Confidence of using online banking even if first time	.840					
Experienced Internet user	.824					
Owns necessary knowledge and skills to use services	.821					
Ability to use Internet without help of others	.820					
Confidence of using online banking only with instructions	.682					
ATTITUDE						
Beneficial - Unbeneficial		.911				
Wise - foolish		.909				
Favourable - unfavourable		.900				
Good idea - bad idea		.896				
SECURITY						
Bank will compensate errors caused by security flaws			.827			
Personal information safe			.801			
Bank will take appropriate action to settle any wrong			.765			
Confidence over security of online banking			.761			
Advances in security make online banking safe	.401		.622			
SUBJECTIVE NORMS						
Decision influenced by friends				.929		
Decision influence by colleagues/peers				.908		
Decision influenced by family				.828		
FACILITATING CONDITIONS						
Govt of Bahrain promotes e-commerce					.903	
Govt of Bahrain active setting up facilities for e-commerce					.900	
BMA as sound controller of online banking					.462	
no problems with BATELCO services						.871
BATELCO services advanced and reliable						.867
Costs of connection of Internet reasonable					.448	.581

The cumulative percentage of variance accounted for by the above and all preceding factors considered in the factor analysis test for users and non-users is equal to 73.74%.

The following logistic regression table for the whole sample indicate that the significant predicting variables for the adoption are represented by attitudes, subjective norms, security, self efficacy as well as the income variable. Education and facilitating conditions related to the telecommunications infrastructure do not play the role of predictors for the respondents as compared to the current non-users (refer to Table 7.3).

Table 7.7: **Binary Logistic Regression Variable (Users/Non-Users)**

	B	S.E.	Sig.	Exp(B)
Constant	.54	.254	.032	1.727
INCOME	-1.795	.406	**.000**	.166
EDUCATION	-.885	.503	.079	.413
Self Efficacy	.362	.100	**.000**	1.436
Attitude	.361	.095	**.000**	1.435
Security	.548	.098	**.000**	1.729
Facilitating Conditions - Government	-.181	.095	**.055**	.834
Facilitating Conditions - Infrastructure	.082	.096	.393	1.085

The Hosmer and Lemeshow Goodness of fit test indicates that the p value of .474 which is computed from the chi-square distribution (7.598) with 8 degrees of freedom represent a good fit of the model.

The three measures of how well the logistic regression model fits the data are shown in the model summary (Table 7.8), ie, McFaddaen's -2 log-likelihood statistic (a conservative measure), Cox and Snell's R^2 (which accounts for sample size and is based on log-likelihoods, and Nagelkreke's R^2(adjusted form of Cox and Snell's R^2) (Foster *et al.*, 2006).

Table 7.8: **Model Summary (Users/Non-Users)**

-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
664.486	.197	.262

The following classification table for the whole sample shows that following the rule of .5 cut off set by SPSS allows us to correctly classify 237/406 = 78.2% of the subjects where the predicted event of adopting online banking was observed. Therefore, this rule allows us to correctly classify 169/268 = 63.1% of the subjects where the predicted event of adopting online banking is not observed. Overall the predictions are correct 404 times out of 571, with an overall success rate of 71%.

Table7.9: **Classification Table (Users/Non-Users)**

Observed		Predicted		
		USER/NONUSER		
		Non User	User	Percentage Correct
USER/NONUSER	Non User	169	99	63.1
	User	66	237	78.2
	Overall Percentage			71.1

The cut value is .500

However, it is worth to note that both the above classification tables should not be used as goodness-of-fit measures because they ignore actual predicted probabilities and instead use dichotomised predictions based on a cut off (in this case .5). For instance, in binary logistic regression, predicting a 0-or-1 dependent, the classification table does not reveal how close to 1.0 the correct predictions were nor how close to 0.0 the errors were. A model in which the predictions, correct or not, were mostly close to the .50 cut off does not have as good a fit as a model where the predicted scores cluster either near 1.0 or 0.0 (Hosmer and Lemeshow, 2000).

From the above results for the three segments of the respondents, it is evident that there are common variables which banks should pay close attention to when formulating their marketing strategies for the adoption of online banking in Bahrain. Education, attitudes, self efficacy, and subjective norms

as well factors pertaining to the facilitating conditions represented by the Government of Bahrain are of importance to the individuals when they make their decision to use online banking.

The next part of the data modelling analysis will look into the research hypotheses proposed in Chapter 4 and statistical tests will be conducted to either support or reject them.

7.3 HYPOTHESES TESTING

The hypotheses generated in this research and which were postulated in Chapter 4 were tested individually taking into consideration both the sign and significance of the individual model parameter.

Path analysis which is an extension of multiple regression procedures was used to investigate the formulated causal relationships in the model as explained in detail in the Research Method Chapter.

The results of the parameter estimation procedure for each hypothesis are displayed in Table 7.10 and the standardised model equations and squared multiple correlations are given in Table 7.11.

Table 7.10: **Research Model Parameter Estimates with Significance Levels**

Model Component	Standardised Parameter Estimate	Sig	t-value	Hypothesis	Hypothesis Result
ATT → BI	0.211	0.000	5.078	H1	YES
PEU → ATT	0.143	0.045	2.881	H1a	YES
PU → ATT	0.293	0.000	5.576	H1b	YES
PR → ATT	-0.020	0.568	-0.572	H1c	NO
AGE → ATT	-0.167	0.000	-3.994	H1d	YES
INC → ATT	0.179	0.000	4.095	H1e	YES
CUL → ATT	-0.016	0.701	-0.385	H1f	NO
SN → BI	-0.060	0.139	-1.481	H2	NO
EXTI→SN	0.005	0.910	0.113	H2a	NO
INTI → SN	0.249	0.000	5.997	H2b	YES
PBC → BI	0.195	0.000	4.730	H3	YES
SE → PBC	0.454	0.000	12.262	H3a	YES
FC → PBC	0.118	0.001	3.196	H3b	YES

KEY

AGE = Age
ATT = Attitude
BI = Behavioural Intention
CUL = Culture
EXTI = External Influences
FC = Facilitating Conditions
INC = Income
INTI = Interpersonal Influences
PBC = Perceived Behavioural Control
PEU = Perceived Ease of Use
PU = Perceived Usefulness
PR = Perceived Risk
SE = Self Efficacy
SN = Subjective Norms

Table 7.11: **Standardised Model Equations and Squared Multiple Correlations**

Dependent Variable	Model Equation	R^2
BI	0.211ATT + (-0.060)SN + 0.195PBC + 1.420ε	0.117
ATT	0.143PEU + 0.293PU + (-0.026)PR + -0.167AGE + 0.179INC + (-0.016)CUL + 1.418ε	0.204
SN	0.005EXTI + 0.249INTI + 1.670ε	0.063
PBC	0.118FC + 0.454SE + 1.350ε	0.233

KEY

ATT = Attitude
BI = Behavioural Intention
CUL = Culture
EXTI = External Influences
FC = Facilitating Conditions
ID = Individual Differences
INC = Income
INTI = Interpersonal Influences
PBC = Perceived Behavioural Control
PEU = Perceived Ease of Use
PU = Perceived Usefulness
PR = Perceived Risk
SE = Self Efficacy
SN = Subjective Norms
ε = Error

In the above multivariate regression analysis, R^2 (the coefficient of multiple determination) equals 0.117, or 12%, 0.204, or 20%, 0.063, or 6% and 0.233, or 23% for each of the four variables listed (BI, ATT, SN, and PBC, respectively). Given that R^2 = explained variance / total variance, R^2 values such as those presented above indicate that on a scatter plot of the data points, the indicated percentages fell on the regression line and the unexplained variation is quite high, meaning this study shows only a weak connection between the dependent and independent variables in each case. It could be that the amalgamated model of the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM) is weak in explaining the formation of attitudes and behavioural intention among the Bahraini retail banking customers using online technology to conduct transactions. If we

compare the prior studies on technology adoption using the TAM and TPB, the low R^2 obtained here suggests a general constraint of these two theories in explaining or predicting technology adoption by the Bahraini customers and to improve these results may require the inclusion of additional factors in the study model. Earlier researchers such as Taylor and Todd, (1995b) had a 52% and Mathieson (1991) had a 70%, while Chau and Hu (2001) secured only a 40% R^2 value.

Although the R^2 results produced by the latter studies are 'better' than the results obtained here, it must be remembered that these studies did not use exactly the same definitions. In addition, the real strength of any regression model is the individual coefficients in terms of magnitude and significance. Other studies (see Chapter 2) have not improved over this study in these terms.

The following is a detailed analysis of the results of each hypothesis tested and a comparison to previous research conducted in the field will be highlighted.

Hypothesis H1

"A favourable attitude toward online banking positively influences the customer's behavioural intention to use online banking services."

The parameter results for the above hypothesis is both positive and significant (ATT→BI = 0.211, t-value = 5.078, $p<0.001$). This suggests the existence of a positive effect of attitude toward the behavioural intention to adopt online banking services in Bahrain. Therefore, this hypothesis is supported.

Literature has demonstrated that a general positive technology attitude enable faster diffusion of Internet based services such as online banking (see Chapter 2). However, the formation of attitudes is a process which is affected by several intervening factors. The model hypothesised that in addition to individual differences (such as age and income), the culture of the country in which online banking is introduced as well as the constructs in the original TAM (namely, perceived ease of use and perceived usefulness) and perceived risk will contribute in the process of attitude formation. In addition, sometimes the consumers may think that a choice of online banking adoption is not beneficial but more time-wasting; he/she might not adopt online banking even though he/she may have a positive attitude toward Internet banking in general (Kim *et al.*, 2005).

Attitudes whether positive or negative influence the intention to adopt online banking. The result of this hypothesis test is in agreement with the literature although the extent of this influence is weak, but nevertheless attitudes play a role in shaping the behavioural intent of the Bahraini bank customer to go online to do his/her banking transactions.

Hypothesis H1a

"Perceived ease of use positively influences the bank customer's attitude towards online banking."

The standardised parameter estimate results for the above hypothesis is both positive and significant (PEU→ATT = 0.143, t-value = 2.811, $p < 0.01$). This suggests the existence of a positive effect of the perceived ease of use on the attitude toward online banking. Therefore, this hypothesis is supported.

Hypothesis H1b

"Perceived usefulness positively influences the bank customer's attitude towards online banking."

The standardised parameter estimate results for the above hypothesis is both positive and significant (PU→ATT = 0.293, t-value = 5.756, $p < 0.001$). This suggests the existence of a positive effect of perceived usefulness on the attitude towards online banking. Therefore, this hypothesis is supported.

Prior research has empirically proved the existence of a positive relationship between perceived ease of use and perceived usefulness as influential factors that affect new technology adoption and online bank adoption in particular (e.g. Venkatesh and Davis, 1996; Agarwal *et al.*, 2000; Johnson and Marakas, 2000; Chau, 2001; Hong *et al.*, 2001; Wang *et al.*, 2003; Pikkarainen *et al.*, 2004).

In the terms of perceived usefulness, online banking provides higher degree of convenience that enables customers to access their bank accounts at all times and places. Apart from that, the accessibility of computers is perceived as a measure of relative advantage (Devlin, 1995; Ainscough and Luckett, 1996; Daniel, 1999, Black *et al.*, 2001; Polatoglu and Ekin, 2001; Suganthi *et al.*,

2001; Gerrard and Cunningham, 2003). In addition perceived usefulness has been constantly identified as an important driver of behavioural intention to use a new innovation in both offline and online technology acceptance research (Venkatesh and Davis, 2000; Venkatesh *et al.*, 2003; Legris *et al.*, 2003).

Therefore, it was expected that both perceived usefulness and perceived ease of use to play their roles in influencing the attitude of the Bahraini consumer in this research. The extent of both their influences on the attitude formation is not strong enough to agree with what the literature has displayed earlier (see Chapter 2).

Hypothesis H1c

"Perceived risk negatively influences the attitude of the bank customer toward online banking."

The standardised parameter estimate results for the above hypothesis is both negative and insignificant (PR→ATT = -0.026, t-value = -0.572, p>0.1). This finding does not support the above hypothesis that perceived risk negatively influences the attitude of the bank customer towards online banking and is not consistent with the logit results (see Table 7.1) which showed that security is one of the influential factors to affect the intention of future adoption among the current non-users segment of the respondents. Therefore, this hypothesis is rejected.

In Internet banking, security is one of the most important future challenges, because customers fear higher risk in using the web for financial transactions (Aladwani, 2001; Black *et al.*, 2001; Gerrard and Cunningham, 2003; Sathye, 1999). The online banking customer usually has doubts about the security measures taken by the providing bank and particularly regarding its privacy policies (Gerrard and Cunningham, 2003). Security and the feeling of trust

have considerable influence on the customer's willingness to engage in online exchanges of money and personal sensitive information (Hoffman *et al.*, 1999; Friedman *et al.*, 2000; Wang *et al.*, 2003).

There is theoretical and empirical support for integrating trust and the construct of risk involved with technology adoption with TAM (Gefen and Straub, 1997; Chircu *et al.*, 2000; Pavlou, 2003). Some researchers have repeatedly identified this construct as a direct determinant to behavioural intention (Jarvenpaa *et al.*, 1999; Gefen and Straub, 2000; Chai and Pavlou, 2002; Song and Zahedi, 2002).

However although research emphasised the importance of risk in shaping the consumer behaviour toward the adoption of online technology and constitutes an obstacle to electronic commerce adoption (e.g. Bhimani, 1996; Cockburn and Wilson, 1996; Quelch and Klein, 1996; Tan and Teo, 2000) some other researchers found risk to be only marginally significant (e.g., Ndubisi *et al.* 2004). An explanation to the conflict in the importance of risk in influencing the intention to adopt online banking could be that earlier studies took place when the current advances in technology and security were not applied to the online banking industry such as Bhimani's results (1996) compared to Ndubisi's *et al.* (2004) results. Future studies in this field may witness the diminishing influence of risk in determining the feasibility of adopting online banking.

Although security breaches can lead to numerous problems such as destruction of operating systems, or disruption of information access (Min and Galle, 1999), continuous upgrades to security act as a comforting shield to users. This could be another contributing factor to this hypothesis results. The insignificance of the construct risk in affecting attitudes is in contrast to the earlier research on technology adoption. The Bahraini customer may have sufficient trust that their providing bank has the competency in providing him/her with minimum risk while transacting online.

Hypothesis H1d

"Age of bank customer has a significant negative influence on his/her attitude toward online banking."

The standardised parameter estimate results for the hypothesis is both negative and significant (AGE→ATT = -0.167, t-value = -3.994, $p < 0.001$). This suggests the existence of a negative effect of age on the attitude towards online banking services. Therefore, this hypothesis is supported.

Wu (2003) found that consumers between the ages of 36 and 40 are the most open to using an innovation while Thompson (2001) reported that the Internet is predominantly used by younger people. Research also indicated that Internet shoppers are more likely to be younger consumers (e.g. Shiu and Dawson, 2002), and frequent online shoppers (who go online about five or more times a year are more likely to be between 24 and 44 years of age (Chang and Samuel, 2004). In contrast, elderly consumers generally prefer to conduct their transactions by interacting with bank employees instead of through technological channels (Zeithaml and Gilly, 1987).

The results of this particular hypothesis testing provided a consistent result with those obtained by the literature. The online banking customer in Bahrain tends to be young as his/her counterparts in other parts of the world.

Hypothesis H1e

"Income of bank customer has a significant positive influence on his/her attitude towards online banking."

The standardised parameter estimate results for the above hypothesis is both positive and significant (INC→ATT = 0.179, t-value = 4.095, $p < 0.001$).

This suggests the existence of a positive effect of income on the attitude towards online banking services. Therefore, this hypothesis is supported.

Wilhelm (2000) has shown that the lower socioeconomic group would be less likely to use the Internet. Other researchers such as Morris and Venkatesh, (2000) reported that socio-economically disadvantaged consumers would be less likely to pay for a monthly fee to subscribe to an Internet service, and would be less likely to have a home computer. Literature also indicated that usually consumers with high incomes show a greater tendency to adopt innovations than do consumers with lower incomes (Zeithaml and Gilly, 1987) and also make online purchases more frequently (Li *et al.*, 1999). Lee *et al.* (2003) found the average computer banking user to be younger, better educated, and with a higher income compared to the average ATM user. In a study conducted in the U.S., Kolodinsky *et al.* (2004) concluded that income and education positively influenced, and age negatively influenced the adoption of phone banking and personal computer banking, while gender was only significant for phone banking.

The Bahraini online banking customer proved to fall within the same category of being highly paid as the other users elsewhere. The support of this hypothesis provides similar results obtained by earlier research carried out in the field.

Hypothesis H1f

"Culture of bank customer has a significant positive influence on his/her attitude towards online banking services."

The standardised parameter estimate results for the above hypothesis is both negative and insignificant (CUL→ATT = -0.016, t-value = -0.385, p >0.1). This finding does not support the above hypothesis that culture of bank

customers has a positive influence on the attitude towards online banking services. Therefore, this hypothesis is rejected.

The dimensions on which culture is measured for this hypothesis were mainly restricted to status seeking and importance of interaction with others as well as competitiveness in being the first to adopt.

Earlier research has demonstrated that cultures with a high degree of individualism are more eager to adopt innovations, whereas individuals in cultures with a high level of uncertainty avoidance hesitate to commit to innovations (Steenkamp *et al.*, 1999; Van Everdingen and Waarts, 2003; Yeniyurt and Townsend, 2003; Bagchi *et al.*, 2004). Therefore, it is expected that the dimensions of individualism-collectivism and uncertainty avoidance may affect an individual's Internet usage behaviour.

However, regardless of whether people are collectivists or individualists, those who have a low level of tolerance for uncertainty will not use the Internet because they perceive the uncertainty involved to be too high (Lim *et al.*, 2004). For countries with a relatively high level of uncertainty avoidance, individualism-collectivism should, therefore, not have any impact on Internet use. Therefore, it would be assumed here that the Bahraini online banking customer falls within this category as culture proved to be insignificant in shaping the attitude toward the adoption as proposed in the study model.

Hypothesis H2

"Subjective norms have a significant positive influence on the customer's behavioural intention to use online banking services."

The standardised parameter estimate results for the above hypothesis is both negative and insignificant (SN→BI = -0.060, t-value = -1.481, $p > 0.1$). This finding does not support the above hypothesis that subjective norms have a

positive influence on the behavioural intention toward using online banking services. Therefore, this hypothesis is rejected.

When it comes to evaluating the feasibility of using online services of any type, the important referents of online service users are often other users in the virtual communities (Gounaris and Dimitriadis, 2003; Smith, 2005; Szmigin *et al.*, 2005). The role of the subjective norm and its direct effect on behavioural intention has been validated in many studies based on the Theory of Reasoned Action and the Theory of Planned Behaviour (Ajzen, 1991; Ajzen and Fishbein, 1980; Pavlou, 2003). However, the influence subjective norm exerts on the behavioural intention to adopt is not consistently significant in research on TAM.

In addition, researchers found that subjective norm influence tends to be more important in the early stages of implementation of new technological system, when users have only limited direct experience from which to develop attitudes (Hartwick and Barki, 1994).

Although online banking is relatively new in Bahrain, it is well past the implementation stage as several banks have already had their systems in operation for some time. Therefore, as subjective norms have been found to be of no significance at all to influence the behavioural intention to adopt, it would be assumed that the influence of subjective norms decreases with time.

Hypothesis H2a

"External influences such as bank promotion and media have a significant positive influence on the subjective norms."

The standardised parameter estimate results for the above hypothesis is positive but not significant (EXTI→SN = 0.005, t-value = 0.113, $p > 0.1$). This finding does not support the above hypothesis that external influences

such as bank promotion and media have a positive influence on the subjective norms. Therefore, this hypothesis is rejected.

The external influences in the hypothesised model referred to mass media and the bank promotion which might be considered by the online banking adopters. Research has shown that young users may be more susceptible to the influence of external factors as their subjective norm is developing and changing as they grow while they may be more exposed to the sources of external influences such as media and advertising (Pedersen, 2001; Townsend, 2000).

However, the above results for this hypothesis testing indicate no significance of these external factors on the formation of the subjective norms for the online banking customers in Bahrain.

Hypothesis H2b

"Interpersonal influences such as those exerted by peers have a significant positive relationship on the subjective norms."

The standardised parameter estimate results for the above hypothesis is both positive and significant (INTI→SN = 0.249, t-value = 5.997, $p < 0.001$). This suggests the existence of a positive effect of interpersonal influences such as those exerted by peers on the subjective norms. Therefore, this hypothesis is supported.

In their research on online banking adoption in Finland, Karjaluoto *et al.* (2002) showed that reference groups have equally affected attitudes and behaviours towards online banking. Measuring attitudes with the Fishbein model, they also suggested that the overall strong positive attitudes towards online banking are strong influencers of the behavioural intention to adopt. In addition, the interpersonal factors which are hypothesised to affect the

subjective norms are intertwined with the cultural aspect of the collectivist society in which the opinion of others have a considerable weight in the decision making process.

Reference groups also impact on consumer behaviour because people try to surround themselves with people and things that are consistent with their own identities (Tornatzky and Klein, 1982; Karjaluoto *et al.*, 2002). As Bahrain is mainly identified as a collectivist society, the extent to which this construct influences subjective norms was expected to have a positive sign. Therefore, the result of this hypothesis testing is in agreement with the influence of interpersonal relations literature.

Hypothesis 3

"Perceived behavioural control over an online banking transaction has significant positive influence on the customer's behavioural intention to use online banking services."

The standardised parameter estimate results for the above hypothesis is both positive and significant (PBC→BI = 0.195, t-value = 4.730, $p < 0.001$). This suggests the existence of a positive effect of perceived behavioural control influences on the behavioural intention to use online banking services. Therefore, this hypothesis is supported.

Perceived behavioural control has been shown in previous research papers to be an important determinant of usage intention. Mathieson (1991) found that perceived behavioural control had a significant influence on the formation of the behavioural intention. Other researchers provided indirect evidence of the effect of perceived behavioural control on intention to use technology and on technology usage, such as the effect of computer self-efficacy (Moore and Benbasat, 1993; Hartwick and Barki, 1994; Compeau and Higgins, 1995, Pedersen, 2003). Dabholkar (1996) found control to be important determinant

in adoption of technology-based self-service. This means that users are more likely to use a technology-based self-service if the sense of control is present.

The model hypothesised that perceived behavioural control to be influenced by both self efficacy of the user and the facilitating conditions such as good infrastructure and government support. The influence exerted by the perceived behavioural control on the behavioural intention of the Bahraini bank customer to adopt online banking proved to be significant and in agreement with the literature.

Hypothesis 3a

"Self efficacy of the bank customer has significant positive influence on the perceived behavioural control."

The standardised parameter estimate results for the above hypothesis is both positive and significant (SE→PBC = 0.454, t-value = 12.262, $p < 0.001$). This suggests the existence of a positive effect of self efficacy on the perceived behavioural control. Therefore, this hypothesis is supported.

Prior studies have shown that there is a positive relationship between experience with computing technology, perceived outcome and usage (Agarwal and Prasad, 1999). Continuing research work on computer self-efficacy could be observed in other information systems studies (Agarwal and Karahanna, 2000; Johnson and Marakas, 2000; Hong *et al.*, 2001). All these studies confirm the significance of computer self-efficacy in explaining the different individual responses to information technology usage.

Accordingly, the self confidence of the online banking user in Bahrain of his/her ability to conduct banking transactions online would be expected to influence his/her perception of being in control in such a virtual environment. The result of the hypothesis testing proves that this variable is significant in

influencing the perceived behavioural control construct. This is in agreement with previous research conducted using the Theory of Planned Behaviour in understanding the adoption process.

Hypothesis 3b

"Facilitating conditions such as government support and a good technological infrastructure have a significant positive influence on the perceived behavioural control."

The standardised parameter estimate results for the above hypothesis is both positive and significant (FC→PBC = 0.118, t-value 3.196, $p < 0.05$). This suggests the existence of a positive effect of the facilitating conditions represented by government support and good technological infrastructure on perceived behavioural control. Therefore, this hypothesis is supported.

Tornatzky and Klein (1982) concluded in their research that the government and industrial support seem to be major driving forces in Internet banking adoption. They inferred this to the fact that both the government and the industry can give potential users the necessary assurances that internet banking takes place in an orderly and well managed environment. This type of assurance which is a facilitating factor for the adoption process and which is hypothesised here to influence the perceived behavioural control, can take the form of government support for conducting online business as reflected in the Bahraini government's campaigns to encourage electronic commerce. Other environmental factors include a suitable technological infrastructure and adequate Internet bandwidth without which Internet banking could not take place.

7.3.1 *Summary of Hypotheses Testing*

The results of the hypotheses testing indicated that the majority of the proposed hypotheses were supported as expected by the researcher (refer to

Table 7.10). The influences of two of the constructs of the Theory of Planned Behaviour - attitude and perceived behavioural control – were found to be in agreement with the predicted model and the literature while subjective norms influence was not.

Four of the hypothesised variables affecting the attitude construct were found to be influential (perceived ease of use, perceived usefulness, age and income) while only two were insignificant (perceived risk and culture).

External influences were found to be of no influence on the formation of the subjective norms, and the latter proved also to be of no significant influence on the behavioural intention to adopt online banking in Bahrain.

Self efficacy proved to be of significant effect in shaping the perceived behavioural control of the online banking user and in agreement with the previous studies findings. Facilitating conditions were also found to be influential in affecting the perceived behavioural control.

Regardless of the results of the hypotheses testing, and as declarations of statistical significance are often associated with decision making, it is important to note at this stage that according to Armstrong (2007) researchers should be careful about the use of statistical significance in the development of knowledge about forecasting. This does not rule out the possibility that statistical significance might help in other areas such as aiding decision makers by drawing attention to areas that need attention; as part of a forecasting procedure (e.g., helping to decide whether to adopt online banking or not); or serving as a guide to a researcher who is analyzing a problem (such as a quick way to highlight areas that need further study). Gelman and Stern (2006) suggest that students and practitioners be made more aware that the difference between "significant" and "not significant" is not itself statistically significant. Although it is standard in applied statistics to evaluate inferences based on their statistical significance at the 5% level, Gelman and Stern

(2006) discuss the move in recent years toward reporting confidence intervals rather than p values, and the centrality of hypothesis testing has been challenged.

In addition, Bobbitt and Dabholkar (2001) and Santos (2003) argued that there is no comprehensive theoretical framework for understanding or predicting consumers' online service adoption process. Furthermore, when some factors were commonly supported by researchers, a high degree of variation still existed on others (e.g. the value of personalization; the requirement of ease of use). Further investigation is warranted into these variations and what are the key contributing factors to online service adoption in general.

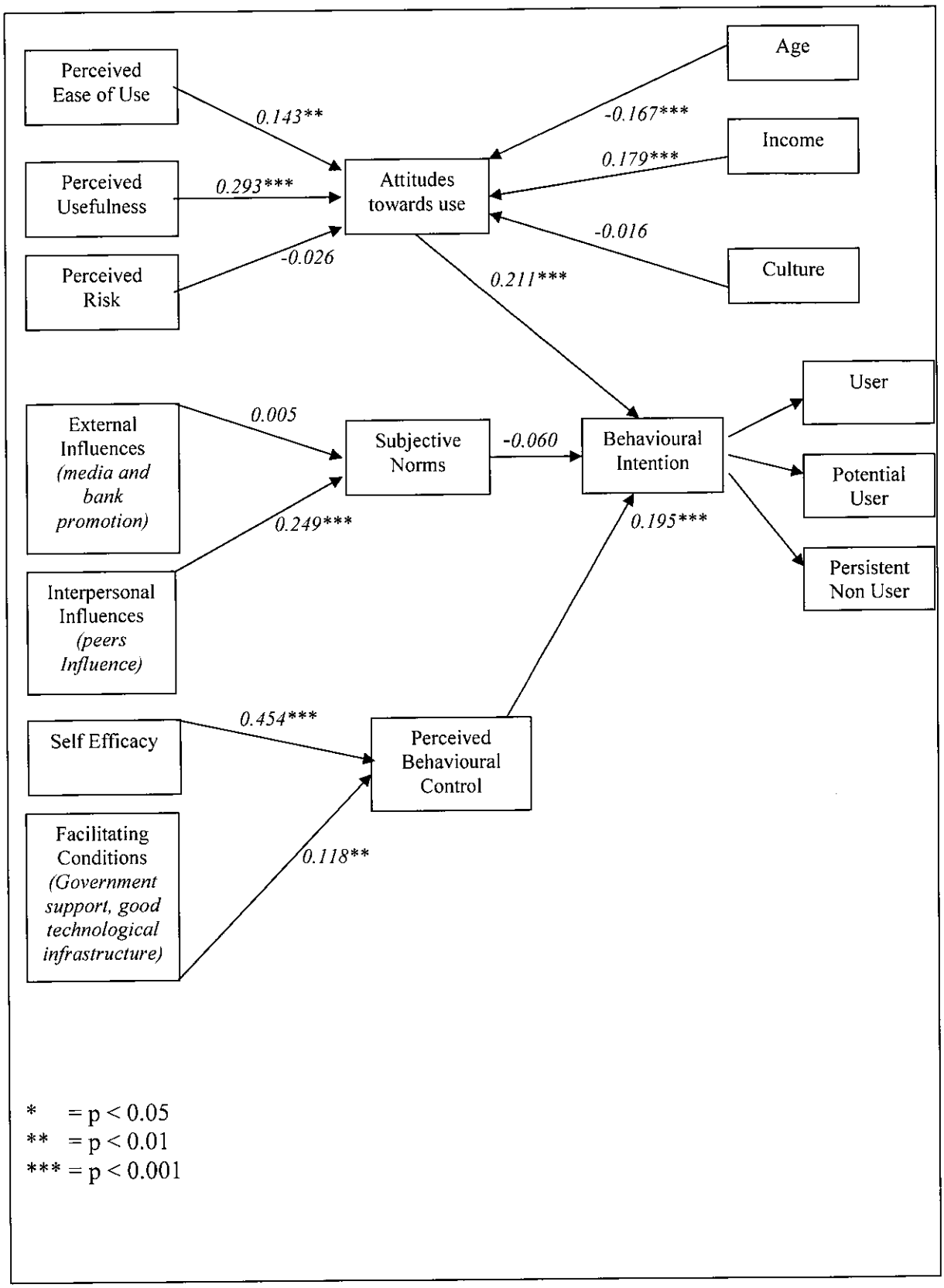


Figure 7.1: **The Research Model Results (Path Diagram)**

When comparing the hypotheses test results displayed in Figure 7.1 and the predicted results depicted in Figure 7.2, there are some discrepancies. The following predicted hypotheses were rejected:

Perceived Risk (PR) →Attitude (ATT),
Culture (CUL) →Attitude (ATT),
External Influences (EXTI) →Subjective Norms (SN), and
Subjective Norms (SN) →Behavioural Intention.

The following hypotheses although were supported, but the degrees of significance were not as strong as expected in all cases:

Attitude (ATT) →Behavioural Intention (BI),
Perceived Ease of Use (PEU) →Attitude (ATT),
Perceived Usefulness (PU) →Attitude (ATT),
Age →Attitude (ATT),
Income (INC) →Attitude (ATT),
Interpersonal Influences (INTI) →Subjective Norms (SN),
Facilitating Conditions (FC) →Perceived Behavioural Control (PBC),
Self Efficacy (SE) →Perceived Behavioural Control (PBC), and
Perceived Behavioural Control (PBC) →Behavioural Intention (BI).

In Figure 7.2, the standardised regression coefficients are shown along each hypothesized relationship. Significance is indicated as follows:

* = $p < 0.05$
** = $p < 0.01$
*** = $p < 0.001$

From Figure 7.1, it can be observed that Attitudes and Perceived Behavioural Control are important while the Subjective Norm is not important when explaining the behavioural intention toward the adoption of online banking in Bahrain. This particular finding was not predicted by the researcher at the

onset of the development of the research model and hypotheses formulation due to the nature of the culture of the country under study.

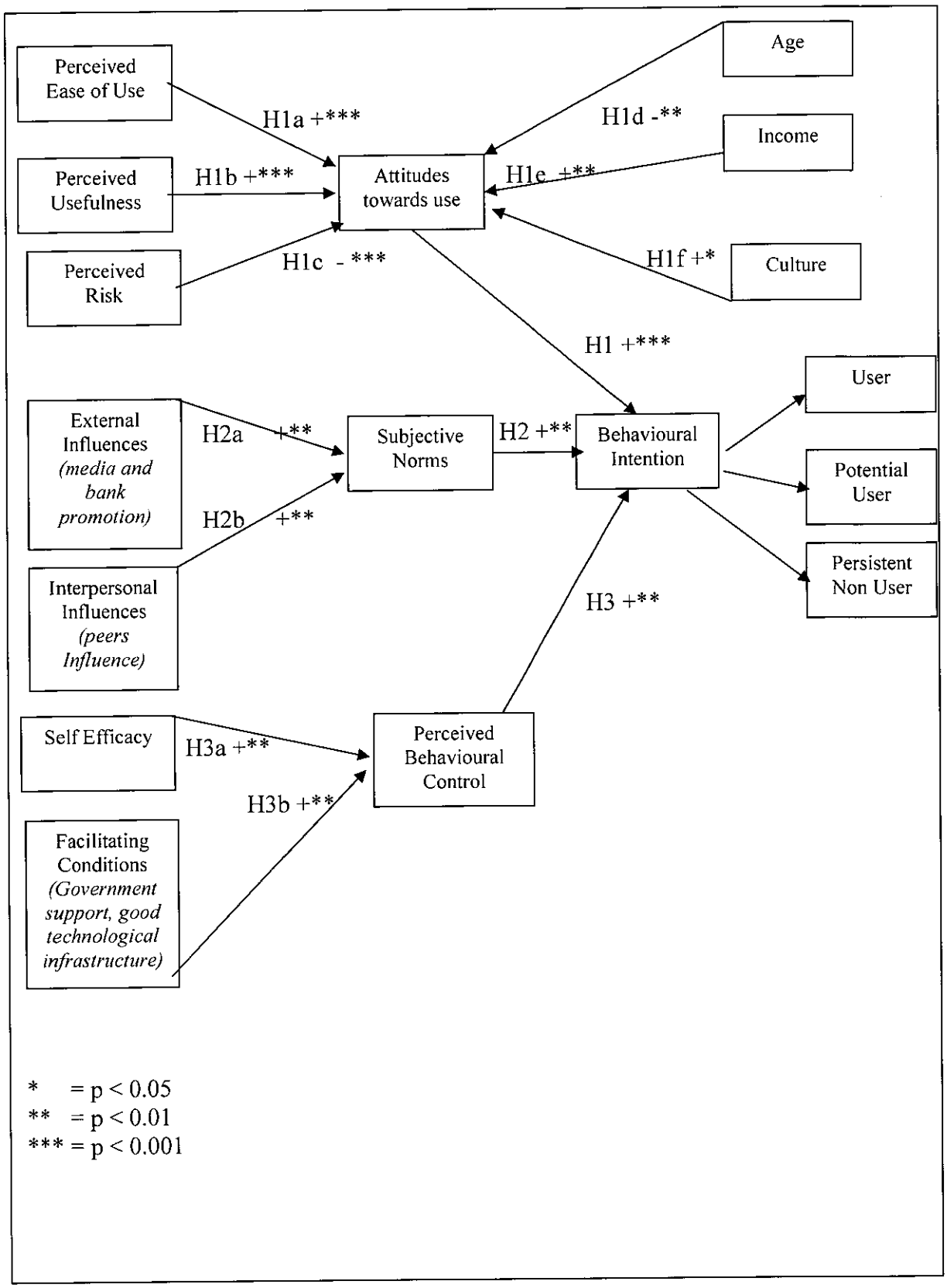


Figure 7.3: **Research Model and Hypotheses with Predicted Results (All Respondents, Users and Non-Users)**

In general, the results of the hypotheses testing showed some unexpected results which are contrary to the literature. For example, perceived risk associated with using online banking services was expected to be of some influence on shaping the attitudes of such technological services. However, the results indicate the absence of such an effect with the regard to the online banking user in Bahrain. The element of risk importance could have decreased due to the advances in security measures adopted by the providing banks which make customers more comfortable with technology usage.

The specific culture of the country proved to be of no significance when it comes to the decision making process regarding the adoption of online banking in Bahrain. Customers in Bahrain displayed similar tendencies to adopt online banking regardless of their environment as those in other parts of the world. However, the influences of peers as represented by interpersonal influences proved to be more significant than those of family members which were not expected in a collectivist society.

However, similar results were shared with findings of earlier research when it came to the influence of perceived usefulness on attitude, perceived ease of use on attitude, age on attitude, interpersonal influences on subjective norms, self efficacy on perceived behavioural control, facilitating conditions on perceived behavioural control and perceived behavioural control on the behavioural intention to adopt.

When looking at the chi-square analysis discussed in the previous chapter, income and age proved to be significant when investigating the relationship of those variables between the two groups of respondents. This finding reasserts that the relationship between both age and income and the adoption variable is not actually a matter of coincidence. This is in agreement with the findings of the hypotheses testing results for these two variables.

The independent sample t-test results (see Chapter 6) also exhibited the significance of income, self efficacy, perceived risk, perceived usefulness, perceived ease of use, subjective norms, and attitudes which compared the mean ratings of current users and non-users of online banking in Bahrain. However, only perceived risk and the subjective norms failed to show any influence on attitudes and behavioural intention to adopt, respectively, in the hypotheses testing results.

On the other hand, when comparing the hypotheses testing results with those of the Pearson correlation tests (Appendix 3), the degree of correlations ranged from no or little relationship to a fair degree of relationship. There were no strong correlations between the variables tested. If we look at Figure 7.1 with the hypotheses testing results, the same types of relationships were reflected in the findings as those in the correlations.

Finally, the researcher attempted to predict the future possibility of adopting online banking users among the current non-users segment of the respondents. The results of the binary logistic regression exhibited a high predicted adoption rate of 88% with an overall success rate of prediction of 74%. The predicted adoption rate is high, but however it should be evaluated carefully against the actual future adoption of those respondents who showed willingness to adopt. In most cases people indicate willingness to act in a specific manner in the future, but uncertainty is also a big factor in the realisation of the predicted behaviour. For this specific reason, some of the literature regarding the behavioural intention to adopt was criticised as the actual adoption was not measured and that behavioural intentions are very poor predictors of actual behaviour (Webb and Sheeran, 2006).

In the following section an analysis of the respondents' feedback is presented. The final part of the questionnaire included a couple of open-ended questions inviting respondents to comment on both feasible strategies to be followed by banks to encourage the use of online banking in Bahrain as well as the degree

of readiness of the country for such advanced technological services. The responses for the latter question varied, but the majority emphasised the importance of utilising the media in educating the public about the benefits of online banking.

7.4 RESPONDENTS' FEEDBACK

Although several alternatives were presented to the respondents to the two open-ended questions given towards the end of the survey distributed to the participants, additional feedback was also invited. The reasons for including alternatives to the open-ended questions were to avoid the possibility of having those two questions neglected by some respondents. The summaries of feedback received for these two questions are as follows:

"What do you think banks should do to encourage people to use online banking in Bahrain?"

One of the main comments which was shared by a number of respondents is that there is general dissatisfaction with the Internet connection rates in Bahrain. Internet services are still being provided by one company in Bahrain – BATELCO - and it is monopolising the market at present. Although the government opened the market for competition in the communications field, but due to the status which BATELCO gained over the years as the first in the market, most of the new comers rent the lines from it. Accordingly, the prices of the competition are not really competitive to the customer. When comparing Bahrain Internet connection costs with its counterparts in the Arabian Gulf region, Bahrain is ranked second after Saudi Arabia. Aladwani (2003) stated that for all but Kuwait and United Arab Emirates in the Arab world the cost of a month's Internet access exceeds that of the U.S.A. (AOL to be specific). The following graph shows the Internet access prices in Arab countries.

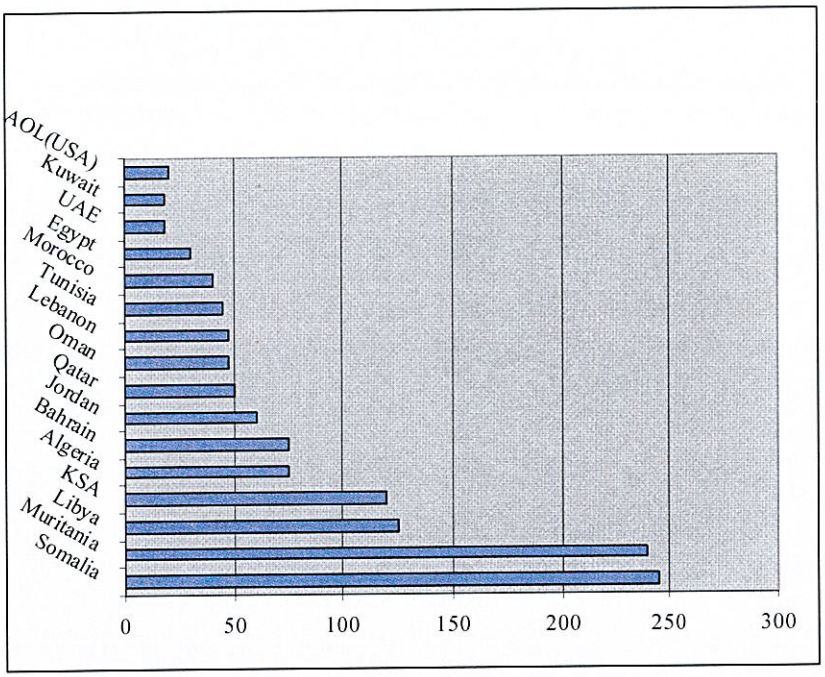


Figure 7.3: **Internet Access Prices in Arab Countries**
(Source: Aladwani, 2003, p. 14)

In addition, other respondents viewed the Internet as an insecure medium to communicate let alone to do sensitive transactions through it. About 76% of the respondents asked for increasing security measures on the bank's web site to encourage the use of online banking in Bahrain. Some were sceptical about the absence of proper documented regulations that clearly specify what banks are liable for when it comes to cases of fraud. Customers should be aware of their rights when they deal with the Internet as a banking channel. Educating the customers about not only the benefits of online banking but also of the regulations was a request by the respondents that banks should pay close attention to (79%). This is the role of banks and media in creating the link between the public and the medium and to create an atmosphere of trust and awareness between the provider, the service and the end-user.

When looking back at the results of the hypotheses testing and how perceived risk did not affect the attitude of the respondents or their behavioural intention

to adopt, it is interesting to find that the majority asked for increased security measures. This is in conflict with hypothesis (1c) result which was rejected.

Another critical issue was the frequent electric power cuts particularly during the summer, when the weather is extremely hot and the load on the electricity system is high. It is a problem which is experienced on an annual basis and most of the time is expected as there is a significant positive correlation between the temperatures and the frequency of power failures in Bahrain. Respondents also asked for an Internet service which is free from technical problems (66%) and to ensure that services in Bahrain are compatible with those provided in the West.

Fifty six percent of the respondents asked for improvement in the download speed from the host bank server while only 32 percent asked for improvement in the response time of the banks to customers' queries sent through the bank's web site.

"Do you think Bahrain is ready for such services? Why?

Feedback from customers varied when it came to the readiness of the country to move to online banking. Although culture did not seem to be an obstacle for such a move (3.5%), nor the technical problems currently experienced with the existing Internet services (3.3%), there was an obvious reluctance as there was no significant agreement on this issue. Cost and security were the two main reasons given for this lack of enthusiasm to accept online banking by a large number of respondents.

The insignificance of culture influence on the adoption of online banking services as expressed by the respondents is in agreement with the findings of the hypotheses testing which arrived at the same conclusion. In addition, the importance of a good infrastructure was emphasised by the respondents and is in agreement with the hypotheses testing results.

Table 7.12: **Summary of Respondents Feedback**

Statement	Agree	%
Improve download speed from host bank server	325	56.9
Improve response time to queries sent via bank web site	183	32.0
Increase security measure on bank's web site	434	76.0
Educate customer on benefits of online banking through media	452	79.2
Provide an internet service which is free from technical problems	377	66.0
Bahrain is ready for online banking because		
Presence of good infrastructure	66	11.6
Bahraini customer always willing to try new technologies	43	7.5
Bahrain is a developing society and we are leaders in the region	31	5.4
Bahrain is **not** ready for online banking because		
Culture of the country is not readily acceptable of such technological services	20	3.5
Internet can never replace actual bank visit	19	3.3
Internet services in Bahrain is full of technical problems	19	3.3

7.4.1 *Summary*

The previous section examined in detail the findings of this research focusing on the model and its relevant significant and insignificant results with a discussion of the theoretical and practical implications of these findings.

The main purpose of this research was to investigate the factors that help shape the intention to adopt online banking in Bahrain as specified in the proposed model and to evaluate the relative importance of each of the proposed variables in influencing the intention to adopt online banking.

The previous results of the hypotheses testing show that some of the variables presented do have a significant influence on behavioural intention while others fail to do so. The variables which were found to be influential whether directly or indirectly were: attitude toward adoption of online banking, perceived ease of use, perceived usefulness, age, income, facilitating

conditions, self efficacy, interpersonal influences, and perceived behavioural control.

7.5 Behavioural Intention to Adopt Online Banking in Bahrain

The model presented in this research indicated that it is capable to a certain degree to explain the behavioural intention toward adoption (R^2 = 0.117). However, this finding is weak in explaining the roles of attitudes, subjective norms and perceived behavioural control in shaping the behavioural intention of individuals when it comes to online banking adoption process. This is a limitation of TAM and TPB in explaining online banking adoption among this study sample.

Only attitude and perceived behavioural control were found to exert some influence on the behavioural intention to adopt online banking. An examination of the total effect of all variables included in the model revealed that attitude toward using the Internet as a banking transaction medium is a more important factor when compared to the perceived behavioural control (.211 and .195, respectively). Subjective norms variable was insignificant in its influence on intention (-.06), although one of the models on which this research is based on is the Theory of Planned Behaviour (TPB) which suggests that attitude, subjective norms and perceived behavioural control variables all influence the behavioural intention to adopt.

The weakness of the subjective norms variable can be explained by the type of technology innovation under study here, online banking, and the perceived implications which can be harvested by adopting this technology. In addition, this finding is also consistent with Davis *et al.* (1989) and Mathieson (1991), and Chau and Hu (2001), but not consistent with Taylor and Todd (1995b), and Harrison, Mykytyn and Riemenschneider (1997). Analysis results concluded that the decision to use online banking in Bahrain ignores the influence of the subjective norms variable.

7.6 ATTITUDE TOWARD ONLINE BANKING ADOPTION IN BAHRAIN

Attitude has received considerable attention in the research on technology adoption and has been supported by many studies (see Chapter 2).
In this study it refers to the perceptions the customers have regarding the usefulness of online banking, its ease of use, risk, and age and income of the user as the two demographic determinants as well as the specific culture of the country, as defined by the proposed model.

Income proved to be an influential variable when it comes to online banking adoption. It could be that customers who earn higher incomes prefer to indulge in technological experiences. Age was found to have a significant negative correlation with attitude. The very young age group represent a segment of people who may be interested in technology but do not have the financial resources to justify using online banking. Results show that the young and middle age groups are interested in online banking adoption in Bahrain.

Perceived usefulness was found to be a significantly influential perceptual variable that affects the attitude towards online banking. Tan and Teo (2000), Polatoglue and Ekin (2001), Suganthi *et al.* (2001), all support the claim that perceived usefulness favourably influences the attitudes toward the use of online banking. When comparing perceived usefulness to perceived ease of use, the magnitude of the effect on attitude is surpassed by the former.

Perceived risk was insignificant when measured as a perceptual variable that affects attitude. This result contradicts most of the literature which found that perceived risk is one of the dominant obstacles that negatively affects attitude (e.g. Tan and Teo, 2000).

The culture of Bahrain was found to be insignificant in influencing attitudes toward online banking. It seems that the Bahraini bank customers do not consider their culture as a restricting variable in the adoption process.

7.7 SUBJECTIVE NORMS

The results show that influence from peers was the only variable that contributed to the effect on subjective norms. External influences such as media and bank promotion were found to have no significant effect on shaping the subjective norms variable. In Bahrain, the government has encouraged the nationals to take employment in all types of professions and trades and at all levels. This has been met with a positive response from the young generation which could explain the move toward independence among this particular group of nationals in the decision-making process. This in turn, reduces the influence of subjective norms in general. When comparing the influence of peers and colleagues as an interpersonal influence on subjective norms to the influence of the family, a considerable significance of influence of the former on the subjective norms variable is found. The integration of the society as a whole has shifted the influence from the immediate family to the peers and colleagues instead.

7.8 PERCEIVED BEHAVIOURAL CONTROL

In the context of this research perceived behavioural control variable was used to identify the effect of the respondents' perceptions of constraints and/or opportunities affecting the online banking intention. The addition of this construct to the Theory of Planned Behaviour which was portrayed in literature as an internal control (represented here by self-efficacy) and an external control (represented here by the facilitating conditions), has been found to influence the behavioural intention and the usage behaviour both directly and indirectly (Mathieson, 1991; Igbaria *et al.*, 1995; Taylor and Todd, 1995a; Agarwal and Karahanna, 2000; Venkatesh, 2000; Hong *et al.*,

2001). Perceived behavioural control was also found to be the most influential factor to encourage customers to shop online by Keen *et al.* (2004).

The finding of this research is in agreement with the literature examined regarding the role this construct plays in shaping consumers' behavioural intention. Both self efficacy and facilitating conditions were found to influence the perceived behavioural control of the Bahraini bank customer (.454 and .118, respectively) with the former having stronger influence on the perceived control. Accordingly, the perceived behavioural control was also found to be significant in its influence on the behavioural intention (.195).

7.9 SUMMARY

This chapter presented the findings of the analysis. It was found that the intention and thereby the adoption of online banking in Bahrain is encouraged by attitudinal and perceived behavioural control factors and impeded by the subjective norms factor. The attitudinal factors that encourage adoption are: perceived ease of use, perceived usefulness, in addition to two significant moderating factors – age and income. On the other hand subjective norms lacked the ability to influence the behavioural intention to adopt online banking in Bahrain. Perceived behavioural control represented by the users' self efficacy and facilitating conditions was found to play a significant role in influencing the behavioural intention toward the adoption process

Although culture was expected to impact the attitude, it did not yield any significant influence. The Arab culture system has been long defined as an authoritarian and collective one according to which the family is more important than the individual (Dwairy and Menshar, 2006). However, the Arab societies in general are diverse and are passing through a succession of changes which may explain the fading influence of culture on attitudes in general.

Non-users were then segmented in accordance to their expressed intention in an attempt to predict if any of the current non-users of online banking would use these services within the next 18 months. Using the binary logistic regression analysis, it was found that almost 88% of the 268 non-users may become users in the specified period of time. Table 7.13 presents a summary of all hypotheses results in relation to the research questions.

A number of studies on online banking ranging from Sathye's (1999) study in Australia, Tan and Teo's (2000) research in Singapore, Hoppe *et al.*'s (2001) South Africa study, Chung and Paynter's (2002a) on online banking in New Zealand, Kerem's (2003) in Estonia, Chang's (2003) work in Korea, Wang *et al.*'s (2003) study of online banking in Taiwan, and Suganthi, *et al.*, (2001), Shanmugam and Guru (2000), Ndubisi *et al.* (2004), Ndubisi and Sinti (2006) in Malaysia were all conducted in an attempt to arrive at a better understanding of the adoption process of this type of banking medium. However, these prior studies on online banking adoption factors have produced mixed results, which make it apparent that there is a difficulty in articulating the online banking adoption drivers. Thus, research on online banking remains inconclusive. Within the few available studies, however, there are conflicting results with respect to the relative importance of the factors that explain online banking adoption.

All of the above findings would call for banks to pay closer attention to the adoption process in Bahrain and to work on encouraging the customers to use it. In the next chapter, implications of these results, directions for future research, limitations and the conclusions will be presented.

Table 7.13: **Summary of Hypotheses Results in Relation to the First Five Research Questions and Relevant Literature**

Research Question	Hypothesis No	Hypothesis Description	Sign of Hypothesized Influence	Hypothesis Results	Example of Technology Adoption Research **Supporting** Result	Example of Technology Adoption Research **Contradicting** Result
Q1, Q3, Q4	H1	ATT → BI	+	**YES**	Karjaluoto, Mattila and Pento (2002)	James, L. (2003)
Q2, Q3	H1a	PEU → ATT	+	**YES**	Wang, Wang, Lin, and Tang (2003)	Lee, Park, Ahn (2001)*
Q2, Q3	H1b	PU → ATT	+	**YES**	Pikkarainen, Pikkarainen, Karjaloto and Pahnila (2004)	Bhatti, T (2007)
Q2, Q3	H1c	PR → ATT	-	NO	McKechnie, Winklhofer and Ennew (2006)	Tan and Teo (2000)
Q2	H1d	AGE → ATT	-	**YES**	Sathye (1999)	Laforet, Sylvie and Li, Xiaoyan (2005)
Q2	H1e	INC → ATT	+	**YES**	Mattila & Karjaluoto (2003)	Chang (2003)
Q2, Q5	H1f	CUL → ATT	+	NO	Quelch and Klein (1996)	Chang (2004) (Lim *et al.* (2004) Park and Jun (2003)
Q1, Q3, Q4	H2	SN → BI	+	NO	Shih and Fang (2004)	Bhatti, T (2007)
Q2	H2a	EXTI→SN	+	NO	--	Pedersen (2002)
Q2	H2b	INTI → SN	+	**YES**	Pedersen (2002)	--
Q1, Q3, Q4	H3	PBC → BI	+	**YES**	Brown, Hoppe, Mugera, Newman and Stander (2004)	Dwivedi, Williams, Lal, Weerakkody and Bhatt (2007)
Q2	H3a	SE → PBC	+	**YES**	Shih and Fang (2004)	James, L. (2003)
Q2	H3b	FC → PBC	+	**YES**	Pedersen (2002)	Shih and Fang (2004)

** An explanation for this insignificance was provided by the authors mainly due to the respondents' characteristics. The sample consisted of knowledgeable Internet users, and therefore, PEU would not necessarily be a significant determining factor on consumers' behaviour*

Research Questions Key:

Q1. What are the most influential factors that affect the customers' intention to use online banking as a transaction channel?

Q2. What are the main characteristics of the users of online banking and what are the main obstacles for further adoption of online banking?

Q3. Why some bank customers find online banking unacceptable while others prefer this medium? Which barriers should be eliminated in order to convince the customers about the feasibility of online banking usage?

Q4. What are the decisive success factors of the Bahraini online banking?

Q5. Does the collectivist nature of the Bahraini society affect the adoption decision of online banking?

Q6. Can behavioural intention predict future online banking adoption for the current non-users sample participants?
(*For the answer to this research question, refer to section 7.2 of this chapter*)

CHAPTER 8

CONCLUSION

8.1 INTRODUCTION

This chapter concludes this research study by summarising the results with the implications they present to the banks in Bahrain, presenting the contribution of this research to knowledge, the limitations of the study, and posits recommendations for future research.

A limited amount of research on technology adoption in the Middle Eastern countries in general and the Arabian Gulf countries in particular is available to explain the factors which make individuals use a particular technology-based service or not in these countries.

As a new banking distribution medium to the retail customers, online banking is still at its early stages in Bahrain. However, there is a good potential for attracting more users in the future in spite of the presence of some issues which represent obstacles to consumer adoption of online services among which attitudes act as a motivator.

Due to the nature of banking transactions and their intangibility, it is easier for banks to deliver their services by the Internet. However, regardless of the praise online banking receives through research, media, and financial institutions, the adoption rates vary across countries. The rush to adopt online banking has not happened yet and not as many customers as banks would desire are using this type of medium for banking (see chapter 2). Bahrain is no exception as this research has found and there are similarities in the

findings with previous literature as well as differences which are unique to this country.

As customers play a key role in making online financial services a success, banks have to pay closer attention to their needs and wants and to tailor a system with which they are comfortable and keen to use. The individual's particular demographic profile represented by age and income in addition to his/her expectations and perceptions regarding usefulness of the system and its ease of use all contribute to the formation of the attitudes which prove to be key factors in determining the feasibility and success of online banking in Bahrain. Although previous technology adoption research has identified the perception of risk in using such a system to be one of the influencing factors in affecting the attitude and consequently the behavioural intention to use online banking as well as the culture of the country, this study did not secure such a link between these factors and the adoption process.

8.2 Overview of Results and Implications

The purpose of this research was to develop a conceptual framework that incorporated aspects of two well-known attitudinal theories to provide a deeper understanding of consumer motivation and behaviour related to a technology-based self-service system, i.e., online banking, in addition to answering the specific research questions presented in Chapter 1. This study examined the relationships between the intention to adopt online banking and variables from the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB) in addition to some internal and external factors (demographic characteristics, self efficacy, culture, risk, marketing influences, government influences). The relative importance of each of these variables in the prediction of intention to adopt online banking was also evaluated.

The results obtained show that these variables have varying influences on the intention to adopt.

The next section will discuss these findings and it will consider the three main constructs in the model, namely, attitude, subjective norms and perceived behavioural control and their influence on the behavioural intention. Then it will break down the variables that affect each of these constructs as hypothesised in Chapter 4 and will highlight the results individually.

8.2.1 *Intention to Adopt Online Banking in Bahrain*

The model presented in this study helped to explain the overall relationships among the variables and the intention to adopt as proposed (R^2=0.117). Attitude and perceived behavioural control were found to be important variables that exert a direct influence on the intention to adopt (total effect = 0.211 and 0.195, respectively) with attitude the more influential variable towards intention. However, subjective norms did not carry any positive significant influence on the intention to adopt.

Therefore, the above necessitates that retail banks should concentrate on influencing the attitudes of the consumers toward the adoption of online banking. The strategies that banks should develop to promote this transaction medium can concentrate on targeting the perceptual beliefs which help shape the attitudes of consumers.

8.2.2 *Attitude*

The empirical research in previous literature has well documented the importance of attitudes in affecting the intention to adopt new technologies (See Chapter 2). This research is in agreement with the importance of

attitudes and the suitability of the proposed model based on TAM and TPB in evaluating consumer adoption of online banking in Bahrain.

First, the moderating effect of gender has been replicated by several studies in the area of technology acceptance in a variety of technologies like web-based shopping, e-mail, and Internet banking. In addition, several recent empirical researches investigated the gender differences in information technology acceptance and usage indicate that the expected gap between genders is diminishing as the technologies are more widely diffused (see Chapter 2). Accordingly, gender was excluded from the research model proposed. In addition, previous research in the technology adoption field identified that several individual differences including level of education and the extent of prior experience have significant effects on TAM's beliefs. However, the results from this study indicate that the majority of the online banking users in Bahrain are married males, working as professional or as office workers, have at least 1 – 4 years of university education and with a high income level. This is generally in agreement with what the empirical literature has suggested. These results indicate that despite the geographic disparity between the Bahraini and the Western online banking customers, users of technological services share the same three demographic characteristics. In other words these transcend culture.

However, as only income and age are included in the model and hypothesised to have an effect on attitudes, this research concludes that both age and income have significant influence on the formation of the attitudes toward online banking adoption (total effect = 0.179 and -0.167, respectively). In terms of policy making in the banking sector in Bahrain, this would be helpful to banks to identify their potential customers and target them in their promotional endeavours to increase the use of technology in banking.

Second, contrary to what was hypothesised and what was expected from previous literature research, perceived risk did not exert a direct significant influence on the attitudes of the respondents that may affect their decision to adopt online banking (total effect = -.020). These findings contradict what most of the literature demonstrated in earlier studies about the importance of the element of risk in accelerating the adoption of new technologies due to uncertainties and privacy issues with the exception of few studies which are in agreement with the findings of this research (see Chapter 2). However, many respondents indicated in their feedback a considerable degree of concern about security and privacy issues in addition to fear of fraud. For banks to speed up the adoption process there is a significant need to find ways to reduce the consumers' concerns about these issues. Banks in Bahrain should make continuous efforts to improve security, provide comprehensive guarantees and most importantly educate the consumers about the nature of the online banking services and the policies and regulations involved.

Third, culture was an additional variable that was hypothesised to affect the attitudes towards online banking adoption in Bahrain. Earlier literature indicated that cultural values may be more useful in explaining and understanding the consumer behaviour than other more widely used consumer variables (e.g. demographics and subjective norms). This study investigated cultural influences in terms of status and identity gain. It concluded that culture does not seem to hold any significance on attitudes which subsequently affect the adoption process for online banking in Bahrain (total effect = -.016). Even though the findings are not statistically significant, this variable should be considered with caution as culture is one element of a complex phenomenon and banks should seek other descriptors of the national environment in which online banking is being offered. This would represent useful marketing opportunities for banks although it is important to understand the context within which the various values may be utilised to the service providers' advantage.

In summary, understanding how attitudes are influenced in the implemented model in this research, perceived ease of use, perceived usefulness, specific demographic characteristics of the individual (age and income), risk and culture were factors found to have varying influences upon attitudes towards online banking. For banks in Bahrain, it would be beneficial to understand these factors which explain attitudes toward the technology adoption. This would provide insight that may speed up the rate and extent of adoption of these banking services and which in return will maximise the return on investments made in the Bahraini banking industry.

8.2.3 *Subjective Norms*

In this research the influence of others' opinions about online banking adoption was also investigated as one of the Theory of Planned Behaviour constructs. The findings of the effect of social influence have been mixed through the investigations of several studies because the concept of social influence is likely to be complex while involving agreement and compliance related to social pressure such as subjective norms as well as identification related to self identity standing for social status gains. In this research the effect of the subjective norms is not significant and most probably the effect of self identity as a status gain concept does not dominate the influence of technology acceptance in this case. From previous research, (see Chapter 2), the long term effect of self identity in the various technology acceptance models in both the post adoption and after adoption stages was attested. However, the sample chosen for this research exhibited a considerable knowledge of computers and Internet usage which may have contributed to the lack of the subjective norms influence.

The path from subjective norms to behavioural intention did not indicate significance in the statistical model. This result is similar to what some other

researchers who concluded that behavioural intention was not predicted by subjective norms. In the early stages of user experience where user interaction with the technology-based service has been somewhat limited, even if an individual does not have a favourable reaction to the technology in question, the individual tends to comply with others' views and use the system to attain a favourable reaction from those important to him/her. However, as direct exposure to the technology increases over time, bank customers accumulate a better evaluation of the benefits and costs associated with using that technology. Even if their original decision was based on others' opinions, users begin to adopt others' opinions especially if they are consistent with the results of their own direct experience. As is the case with the Bahraini bank customer, the direct effect of subjective norms on behavioural intention is reduced. With increasing experience, customer's judgments reflect specific criteria that result from the interaction with the banking system being used and less from normative influences. Earlier research suggested that the influence of people diminishes to a state of non-significance over time with increasing self experience. More than 80 percent of the respondents in this research had at least two years' experience with the Internet in general which places them past the novice technology user category.

8.2.4 *Perceived Behavioural Control*

Computer self efficacy is a salient variable that helps consumers improve their perceived behavioural control over the technology in use. The study concluded that consumers' positive judgment of their abilities to use the Internet and computers would favourably influence their perceptions of overall PBC (total effect = 0.195). This finding indicates that computer self efficacy would lead to more favourable behavioural control which would subsequently affect the intention to adopt. The designers of online banking systems have to ensure that people would use such systems in which large

investments are made. To achieve this goal, they must design easy to use systems which would create favourable beliefs on the PBC of customers. Banks should organise computer training sessions and motivational sessions to increase general computer self efficacy and confidence of the potential users of the systems as people who demonstrate higher computer self efficacy are more readily prepared to use online banking services as they show favourable PBC.

Banks should try to boost confidence and enhance self efficacy in using online banking services. This could be achieved by conducting demonstrations and presentations at the bank branches to emphasise the user-friendliness of such systems. Such initiatives will help customers to become more familiar with the bank and its online banking services, which are considered important factors in the adoption process.

The facilitating conditions represented by good infrastructure and government support as hypothesised to affect the variable of perceived behavioural control proved to be significant in the proposed model. Although the Internet has been in Bahrain for some time now as compared to other Arabian Gulf countries, it has numerous problems which cause failure to the system on frequent occasions. In fact, as supporting technological infrastructures become easily and readily available, online banking services will also become more efficient and subsequently acceptable by customers. Accordingly, the government can play an intervention and leadership roles in the diffusion of this innovation.

8.3 RESEARCH QUESTIONS

In the light of the findings in Chapters 6 and 7 regarding the analysis and modelling of the data obtained, the following conclusions are drawn for each research question and hypothesis.

1. What are the most influential factors that affect the customers' intention to use online banking as a transaction channel?

The results of this research propose that attitudes and perceived behavioural control exert positive influences on the behavioural intention to adopt online banking services in Bahrain. Attitudes in particular which are shaped by certain factors some of which are related to the customers demographic characteristics such as age and income and other beliefs (perceived ease of use and perceived usefulness) impacted heavily on online banking behaviour. On the other hand, perceived risk and culture did not play any significant roles on the attitude formation process of the Bahraini bank customer when choosing online services which is contradictory to the literature (see Chapter 2).

2. What are the main characteristics of the users of online banking and what are the main obstacles to further adoption of electronic banking?

Only two demographic factors of the online banking customers exhibited some influence on the adoption process. Age and income proved to be influential in choosing this banking channel. These results suggest that the typical online banking user in Bahrain is relatively young, with a high level of income. These findings are in line with the previous studies relating to both online services adoption in general and online banking adoption in particular (see Chapter 2). By understanding the specific demographics that indirectly hold some significance on the consumer's behavioural intention, bank officials can use this information in the segmentation of potential online customers. Accordingly, strategies that banks could and should adopt may concentrate on consumers who are not in the middle class and whose income is in the lower ranges. In addition, older customers should not be neglected by banks particularly as this segment tends to exhibit more negative attitudes toward technology-based services such as online banking.

For a country of the size of Bahrain, providing online banking services can be costly. Achieving critical mass is a key success factor in online banking development and introduction and this can only be achieved by substantial penetration of a sound telecommunications infrastructure and support from the government.

3. Why do some bank customers find online banking unacceptable while others prefer this medium? Which barriers should be eliminated in order to convince the customers about the feasibility of online banking usage?

Many factors contribute to the acceptance of the online banking channel among customers. The findings from both the hypotheses testing and the respondents' feedback indicate that current users of this channel perceive it as useful, easy to use and of low risk level. This reflects the beliefs those users hold of the services provided by their banks. It is only rational to conclude that the more secure, useful and easier to use the online banking is as perceived by the bank customer, the more likely that he/she will adopt it. Ensuring that technology is compatible with people's beliefs is not so much a matter of changing technology as changing the visions that influence technology development. Technology and beliefs are not necessarily incompatible regardless of the culture in which they are present. Technology can support and complement individuals' beliefs and help simplify their daily lives. Banks should begin to conduct and translate the findings of field research conducted in Bahrain into new technology products as people will accept more easily an idea they initiated than something forced upon them.

4. What are the decisive success factors of Bahraini online banking?

It has been clearly signalled from the respondents' feedback that the government's role in enhancing the electronic environment is vital for the success of any new technology-based services to be introduced in Bahrain. The readiness of the telecommunications infrastructure is an important criterion for the success of online banking. In addition, there is a strong need for a sound regulatory framework to monitor this kind of services and offer the customers assurances that this channel really works and should be adopted by the public. This regulation is also required to control the Internet connection costs as customers believe that having a good infrastructure is crucial but the existence of relevant laws and control will give it more authenticity and credibility in the eyes of the public.

The issue of security was frequently cited by respondents as a major barrier to widespread consumer adoption. Customers still perceive this issue as detrimental to the success of online banking. Although the past few years have witnessed remarkable advances in the ability to provide cost-effective and highly secure banking transactions over the Internet, customers still have a fear of loss of their money. However, experts now claim that a well designed online banking system is less vulnerable to fraud and attack than a physical bank location or an ATM.

5. Does the collectivist nature of the Bahraini society affect the adoption decision of online banking?

Although literature has provided evidence that culture can play an important role in shaping consumer behaviour toward adopting new technologies in general and online banking in particular (see Chapter 2), this research showed that such hypothesised influences are not significant. Customers in Bahrain are on a par with their counterparts in the Western world and tradition and

national culture do not impact significantly on their decisions when it comes to technology adoption.

6. Can behavioural intention predict future online banking adoption for the current non-users sample participants?

Previous research indicated that substantial differences exist in the non-adopter population of online banking specifically between prospective adopters and persistent non-adopters. This research has indicated that the majority of the current non-users (88%) have the potential of being future online banking users. Although this percentage is quite high, it would be optimistic to expect that this majority will indeed become online banking users within the next 18 months. Nevertheless, with their expressed interest and intent to adopt, it would be assumed that the majority of the current non-users are most likely to be potential users. Therefore, behavioural intention did help in predicting future online banking adoption for the current non-user sample participants and the accuracy of the predication is yet to be realised.

8.4 CONTRIBUTION TO KNOWLEDGE

This research has sought to provide an empirical examination of the online banking in Bahrain. Therefore, the contributions of this research can be summarised as follows:

8.4.1 *Managerial Contribution*

(i) Existing research on technology adoption in the Arabian Gulf region is scarce and this research represents a first examination of this issue in a region reputed for its adoption of the latest technological innovations. With regard to Bahrain, this is a pioneering empirical research which

takes the retail bank customer's perspective into account and investigates the drivers of adoption or rejection of online banking.

(ii) The source of the data collected for this research is from the local perceptions of the users of online banking in the country. The results reflect what the perceptions of the customers of retail banking in Bahrain are and their concerns about online banking which have not been investigated otherwise by their banks. Such information can prove valuable to banks to pinpoint areas of weaknesses and strengths as well as opportunities for expansions.

(iii) With the results of this empirical research, banks can better segment their target market as it identifies the young-middle age segment as the current online banking users in Bahrain. Strategies should be formulated to ensure the satisfaction of this segment of the market with the services provided and at the same time attract the other segments which are reluctant to use this banking medium.

(iv) As previous research practice of segmenting the adoption of online banking identified only two categories of customer (users and non-users), this research emphasises that this is an oversimplification of the issue, as this segmentation does not shed useful light on the implications of the research results. Here, the feasibility of identifying the distinctive customer segments among the current online banking non-users in Bahrain on the basis of the motivational and perceptual factors towards this technology-based service is analysed. This identification of potential users would be helpful for the commercial banks particularly when marketing their new services on the Internet. It would enable them to concentrate their marketing efforts on the potential users and persuade them to move into the users segment. An attempt to change the perceptions of the persistent non-users about this transaction medium

and to emphasise the positive aspects of it such as convenience and ease of use should be made by banks.

(v) The survey tool used for the gathering of the data from the respondents is a custom-made questionnaire designed specifically for this research and which can be adopted for use in the future for gathering data on various technology adoption researches. By using the same tool, similar studies could be conducted at later dates and compare the results to evaluate the effectiveness of strategies followed by the banks. This will determine areas of weaknesses in such strategies and remedial solutions could be taken accordingly.

(vi) Banks in cooperation with the Central Bank of Bahrain as the main regulator of all banking operations on the island should give customers necessary assurances to clarify any ambiguity about online banking in Bahrain. This can be achieved by establishing an official approved code of business which should be distributed to all parties involved.

(vii) As security concerns were repeatedly mentioned from the respondents' feedback, banks should be able to explain to their customers what their current security measures are, and what each level of security entails.

(viii) There is a need for branch managers to conduct workshops and presentations for the bank customers to demonstrate the simplicity and ease of use of online banking. Awareness of the features and the capabilities of the system as well as its user friendliness will be of stronger effect if customers have the opportunity to try the system with guidance from bank officials. However, care should be taken to reinforce the fact that ease of use does not necessarily imply lenient security measures but more of user friendliness than complexity.

(ix) Currently, when customers ask for online banking services to access their accounts, the bank provides these customers with the Personal

Identification Number (PIN) and then customers are left on their own and asked to follow online instructions. There is a need to produce pamphlets that give a description of how to use the system including the help numbers to contact in case of difficulty.

(x) Customers need a written documentation from the banks that lists their responsibilities as well as their rights when operating in an online environment to conduct banking transactions. Such documentation will help minimise the element of insecurity and lack of trust that is currently attached to online banking in Bahrain as expressed by the respondents.

(xi) Promotional campaigns that target potential customers emphasising the convenience factor of using online banking (such as avoidance of long queues, parking problems, travelling in hot weather conditions to conduct a simple banking transaction). These promotional messages with careful planning can play a significant role to convince people to try these services particularly with the unfavourable weather conditions in Bahrain.

(xii) The government represented by the Central Bank of Bahrain should liaise with the telecommunications services provider in Bahrain to help provide a system which would minimise the breakdowns in connections as well as provide an overall dependable and secure communications infrastructure. This is an important aspect to encourage the transfer to the e-government system which is being aggressively promoted on the island. The success of any technology-based service is dependent on the soundness of the telecommunication infrastructure which is being used to deliver these services.

8.4.2 *Contribution to Theory*

(i) Theoretical models used to investigate the user acceptance, adoption and usage behaviour such as TAM and TPB have been widely used to examine and understand the technology adoption process. In this research the model used confirms the appropriateness of the model in predicting online banking adoption intention in Bahrain despite its weakness in explaining the adoption process.

(ii) Even though several constructs were included in the model and extensions to both TPB and TAM were incorporated here, many of the relevant findings indicate a need to develop different adoption model versions depending on both user segments and services being studied. For example, different variations of the suggested model may be necessary to help explain the adoption of online banking among young end-users.

(iii) This research contributes to the existing technology adoption theory as it explores the applicability of a framework which combines both the Theory of Planned Behaviour and the Technology Acceptance Model that empirically traces the adoption process from its conception to the intention and adoption stages.

8.5 LIMITATIONS

This study like any other research has its limitation which can be summarised as follows:

First, although the sample was collected on random basis, the sample frame used for this research happened to consist of mostly those who had considerable knowledge about the Internet and thus could be considered experienced Internet users. Accordingly, the sample of respondents may be

skewed toward the more experienced group of respondents. This fact should be treated with caution when generalising the findings of this research on the whole population of Bahrain.

Second, as the sample used was cross-sectional in nature, data collected accordingly depict the relationships among variables studied at the time of data gathering. It could be more insightful to utilise a longitudinal sample particularly when it comes to the segmentation of the non-users segment of the sample and prediction of future online banking usage. Prediction of behavioural intention should be followed up to confirm the validity of the findings of the intention analysis.

Third, with regard to the statistical method used in analysing the data, the path analysis method is a favoured technique for the inference of multiple causal interrelationships among variables (see Chapter 5) and directionality is an important issue when presenting the path model diagrams. The directionality used in this research was mainly based on the technology adoption literature and past empirical research. Therefore, the results of the analysis of these directional relationships depict those in the model used in these studies which are not necessarily the exclusive relationships. It is particularly sensitive to the model specification because failure to include relevant causal variables or inclusion of irrelevant variables often substantially affects the path coefficients, which are used to assess the relative importance of various direct and indirect causal paths to the dependent variable. Path analysis merely highlights which of two or more competing models, derived from theory, is most consistent with the pattern of correlations found in the data (see Chapter 5). The path analysis has also the limitation of measurement error as it assumes the correctness of the measurement of the variables used in the research model.

Fourth, the model itself with the amalgamated Theory of Planned Behaviour and Technology Acceptance Model assumes that individuals are motivated to perform a given behaviour with a set of identical belief structures among the respondents. From a theoretical perspective, this is a heroic assumption but nevertheless an unavoidable one.

Fifth, although online banking services in Bahrain have been launched in 1999, its usage has been very limited until recent years. Accordingly, this fact may mar the results obtained and falsely restrict its generalisability. This is due to the fact that online banking is still at an early stage of the diffusion process in Bahrain and the results obtained would not necessarily be representative of the situation at a later stage in time. However, with the move towards e-government in Bahrain and the support of the top officials in the country to implement it, online banking may find more support from the public. Future research would rectify this limitation and comparison of results would be beneficial.

8.6 FUTURE RESEARCH

As this study is the first of its kind to be conducted in Bahrain, it is worthwhile to pay closer attention to some issues raised by this research. It is of importance to delve deeper into the adoption of technology as many establishments are investing substantial amounts in this arena.

In addition, it is important to emphasise that indigenous research is called for when studying consumer behaviour and not adopt and generalise the findings of foreign research. The environment in which each research is conducted is usually unique and it would be presumptuous to apply the findings to other countries with different environments and cultures.

Online banking is still a new technology in Bahrain which creates a number of issues that affect the consumers' intention to adopt these services. There are still a number of issues which could be investigated to better understand the behaviour of the online banking customers in Bahrain. These include studies that identify additional factors that influence the technology adoption decision making process. Other studies may be performed on the data accumulated by the current research to identify factors that may be of influence on adoption rates and were not emphasised in this research.

This study has not measured the actual usage of the online banking services of the users segment of the respondents which was originally suggested by the Theory of Planned Behaviour (TPB). It assumed that the intention to adopt would be a good indication of usage itself. To secure a comprehensive investigation of online banking in Bahrain, this measure should be incorporated in future studies and investigated as actual usage rather than intention to use.

Also, this research has identified 'young' users as particularly important and there is a definite need for further research to investigate this group in particular.

A parallel comparison of online banking with other bank services such as branch networks, ATMs, mobile banking would also help explain online banking in Bahrain. It is noteworthy that such comparisons may reveal which combination of these distribution channels are likely to lead the service providers to the quickest path to the adoption of online banking as well as the provision of the most satisfied customers.

Future studies may also addresses the different aspects of marketing strategy, promotional and communication issues to attract new online banking users, and effectively maintain the existing customers and ensure their satisfaction.

Future research could also redesign the model proposed in this thesis and employ the variables which were found to be of some significance by treating the independent dimensions as moderators of the relationship of perceived usefulness, and ease of use with behavioural intention instead of attitude. By regarding computer self efficacy as moderator, for example, one can better understand the level or extent of influence that perceived usefulness, and ease of use has on behavioural intention at different levels of self efficacy of customers. This understanding will assist in the development and design of marketing interventions that could be useful in reaching different groups of potential adopters.

Finally, this study covered individual retail customers of online banking in Bahrain. Future studies should be extended to include companies and businesses. This would enable banks to draw a comparison between these types of customers and better define the factors which influence each group's adoption decisions and what each group looks for as criteria for the selection of online services. In addition, the type of services required by the businesses may help banks in their future online banking strategies formulation and expansion.

8.7 CONCLUDING REMARKS

Online Banking in Bahrain is far from being a priority for both retail banks and customers. The Bahraini customer needs encouragement and a sense of security when transacting online. The encouragement should come from both the providing banks and the government to make customers realise the full potential of this banking medium. For example, some banks in the Kingdom of Saudi Arabia such as Al-Rajhi Financing Company offer their customers special incentives for using online banking. A free broadband line for a year, an increased interest rate on deposits in addition to special discounts when

transacting online are some of the incentives offered to customers in Saudi Arabia. Banks in Bahrain could introduce similar offers to their customers to tempt them to go online to do their banking transactions. Customers should be able to feel the benefits and privileges of using the Internet when banking.

The government's role in this area comes by providing an uninterrupted Internet service at affordable prices to the public. Although the Central bank of Bahrain acts as a strict regulator of the banking industry, security and trust in the online banking system should be reinforced in the bank customers by improving the online banking regulatory system.

Online banking in Bahrain has a long way to go to be accepted on a national level among all bank customers as the case everywhere. The country is working hard to realise this goal with the government's support to encourage the use of technology as a step towards the electronic government (e-government). However, great efforts have to be made to make this banking channel acceptable to the people in order to justify the huge investments banks have made in addition to their current brick and mortar facilities. Without a sound infrastructure to support these services and encouragement to adopt on the part of banks, this will take a long time.

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APPENDICES

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APPENDIX 1

VARIABLES DEFINITIONS

VARIABLES DEFINITIONS

Variable	Author/Year	Definition	Definition Relevant To The Research
Adoption Intention	Bagozzi, Davis,and Warshaw (1992)	A user's intention to adopt the application or the technology (Bagozzi, Davis,and Warshaw).	Person's subjective probability that he will perform some behaviour (Ajzen, p 288). The behaviour under study here is the adoption of online banking services.
	Fishbein, Ajzen (1975)	Person's subjective probability that he will perform some behaviour (Ajzen, p 288).	
	Sheeran, Milne, Webb, and Gollwitzer (2004)	The instructions that people give themselves to perform particular behaviours or to achieve certain goals. (Sheeran, Milne, Webb, and Gollwitzer, p 2).	
Attitude	Fishbein andAjzen (1975)	An individual's positive or negative feeling (evaluative effect) about performing the target behaviour (Fishbein andAjzen, p. 216).	An individual's positive or negative feeling (evaluative effect) about performing the target behaviour (Fishbein andAjzen, p. 216).
	Gordon Allport (1935)	A mental and neural state of readiness which exerts a directing influence upon the individual's response to all objects and situations with which it is related (Allport, p 810).	
	Lutz (1981)	Covert feeling of favourability toward an object, person, issue or behaviour (Lutz, p. 234).	
	Baron and Byrne (1984)	Relatively lasting clusters of feeling, beliefs and behavioural tendencies directed toward specific	

	Fishbein, Ajzen (1975)	persons, ideas, objects or groups (Baron and Byrne, p. 126). A learned predisposition to respond to an object in a consistently favourable or unfavourable manner. (Fishbein and Ajzen, p. 6).	
Behaviour	Fishbein, Ajzen (1975)	Observable acts that are studied in their own right (Fishbein and Ajzen, p. 13).	Based on Fishbein and Ajzen (1975) definition, the observable act studied will be the actual use of the online banking services provided by the bank.
External Influences	IRDC (International Research Development Center) 2005	Conditions that exist in a firm's external environment and may affect its technology-adoption decisions. These factors can be found at the industry level, in the macroeconomic environment, or in national policies.	Conditions that exist in a firm's external environment and may affect its technology-adoption decisions. These factors can be found at the industry level, in the macroeconomic environment, or in national policies.
Facilitating Conditions	Taylor and Todd (1995) Venkatesh, Morris, Davis, and Davis (2003) Venkatesh, Morris, Davis, and Davis (2003)	The availability of resources needed to engage in a behaviour, such as time, money or other specialized resources (Taylor and Todd, p. 150). Objective factors in the environment that observers agree make an act easy to accomplish. (Venkatesh, Morris, Davis, and Davis, p 430). Degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system (Venkatesh, Morris,	Degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system (Venkatesh, Morris, Davis, and Davis, p 453). In this research the facilitating conditions would include the government support as a regulator of the online banking industry and the availability of a good telecommunication infrastructure.

	Thompson, Higgins and Howell (1991)	Davis, and Davis, p 453). Provision of support for users of PCs may be one type of facilitating condition that can influence system utilization. (Thompson, Higgins and Howell, p. 129).	
Interpersonal Influences	Kim, H. and Kim, J. (2003) Rice, Grant, Schmidt, and Torobin (1990) Venkatesh and Brown (2001)	The degree of interaction among people in their social context (Kim and Kim, p. 96). Social influences are the extent to which members of a social network influence one another's behaviour (Rice, Grant, Schmidt, and Torobin, p. 28). influence exerted through messages and signals that help to form perceptions of the value of a product or activity (Venkatesh and Brown, p. 71).	Based on Venkatesh and Brown (2001) definition, the influence exerted from peers, family and friends that help to form perceptions of the value of usage of online banking services.
Perceived Behavioural Control	Ajzen (1991) Ajzen (1991)	The perceived ease or difficulty of performing the behaviour and it is assumed to reflect past experience as well as anticipated impediments and obstacles (Ajzen, p. 188). Beliefs about the presence of factors that may facilitate or impede performance of the behaviour and the perceived power of these factors (Ajzen, p 182).	Beliefs about the presence of factors that may facilitate or impede performance of the behaviour and the perceived power of these factors (Ajzen, p. 182).

	Van Akkeren and Harker (2003) Taylor and Todd (1995)	Amount of requisite opportunities and resources (time, money, skills, co-operation of others) someone posses to be able to carry out the course of action (technology adoption. (Van Akkeren and Harker, p. 206). Perceptions of internal and external constraints on behaviour (Taylor and Todd, p. 149).	
Perceived Ease of Use	Davis, 1989 Shih and Fang (2004)	Degree to which a person believes that using a particular system would be free from effort" (Davis, p.320). The degree to which an innovation is perceived as relatively difficulty to understand and use (Shih and Fang, p. 216).	Degree to which a person believes that using a particular system would be free from effort" (Davis, p. 320).
Perceived Risk	Featherman and Pavlou (2003) Cox and Rich (1964) Murphy and Enis (1986)	Prominent barrier of consumer acceptance of services in an e-commerce environment (Featherman and Pavlou, p.451). The overall amount of uncertainty perceived by a consumer in a particular purchase situation (Cox and Rich, p. 34). Customer's subjective assessment of the consequence of making a purchasing mistake. (Murphy and Enis, p. 34).	Prominent barrier of consumer acceptance of services in an e-commerce environment (Featherman and Pavlou, p. 451) and in this case the acceptance of online banking services.

	Ahn, Park and Lee. (2004)	Overall amount of uncertainty or anxiety perceived by a consumer in a particular product/service when the consumer purchase online.	
Perceived Usefulness	Davis, 1989	The degree to which a person believes that using a particular system would enhance his or her job performance (Davis, p. 320).	The degree to which a person believes that using a particular system would enhance his or her job performance (Davis, p. 320).
	Shih and Fang (2004)	The degree to which an innovation provides benefits which supersede those of its precursor (Shih and Fang, p. 216).	
Self Efficacy	Bandura (1994)	People's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave. (Bandura, p. 72).	An individual' self-confidence in his/her ability to perform a behaviour (Taylor and Todd, p 150) such as using online banking services.
	Bandura (1986)	People's judgements of their capabilities to organize and execute course of action required to attain designated types of performances. It is concerned not with the skills one has but the judgements of what one can do with whatever skills one possesses. (Bandura, p.391).	

	Bandura (1997) Taylor and Todd (1995) Venkatesh, Morris, Davis, and Davis (2003)	beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations" (Bandura, p. 2) An individual' self-confidence in his/her ability to perform a behaviour (Taylor and Todd, p 150) Judgement of one's ability to use a technology (e.g. computer) to accomplish a particular job or task. (Venkatesh, Morris, Davis, and Davis, p. 432)	
Subjective Norms	Ajzen (1991) Ajzen and Fishbein (1975) Taylor and Todd (1995)	A social factor is the perceived social pressure to perform or not to perform the behaviour Person's perception that most people who are important to him think he should or should not perform the behaviour in Question (Ajzen and Fishbein, p 302) Perceptions that significant referents desire the individual to perform or not perform a behaviour (Taylor and Todd, p. 149)	Perceptions that significant referents desire the individual to perform or not perform behaviour (Taylor and Todd, p. 149).

APPENDIX 2

QUESTIONNAIRE

Questionnaire Cover Letter
Questionnaire (English Version)
Questionnaire (Arabic Version)

بسم الله الرحمن الرحيم

الأخ الفاضل / الأخت الفاضلة

لقد بدأت معظم البنوك التجارية في البحرين في إطلاق خدماتها المصرفية الالكترونية من خلال شبكة الإنترنت وذلك لتسهيل انجاز معاملات الزبائن وتشهد هذه الخدمات اقبالاً لدى الكثيرين.

وكجزء من إعداد رسالة الدكتوراه حول هذا الموضوع ومحاولة تقييم هذه التجربة الالكترونية في البحرين ومدى تقبل الزبون البحريني لها أرفق مع هذه الرسالة استبياناً لاستطلاع آراء مستخدمي جميع الخدمات المصرفية في البحرين من الفئتين (مستخدمي الخدمات الالكترونية و العادية). ومن خلال نتائج هذا الإستبيان آمل الوصول إلى فهم أفضل للطريقة المثلى لتقديم خدمة سريعة ومثالية للزبون البحريني.ولذلك **أرجو منكم التكرم بإجابة هذا الاستبيان حتى وان كنتم من غير مستخدمي الخدمات المصرفية الالكترونية في الوقت الحالي** حيث أن آرائكم سوف تغني نتائج هذا البحث.

إن نجاح هذا الإستبيان يعتمد في المقام الأول على تعاونكم من خلال إجاباتكم الصريحة على الأسئلة المطروحة فيه. وبناء عليه أتقدم منكم راجية حسن تجاوبكم في انجاز هذه المهمة وملء الإستبيان المرفق. كما أحب أن أؤكد على أن جميع الإجابات ستعامل بسرية تامة ولن يتم إعلان الإجابات فردية ، بل ستقدم وتحلل كمحصلة إجمالية لجميع الردود المقدمة.

الرجاء الاتصال بي شخصياً على البريد الإلكتروني التالي في حال وجود أي استفسار :
larahman@buss.uob.bh

هذا ما لزم مع بالغ شكري وتقديري لتعاونكم.

لطيفة أحمد عبدالرحمن محمد
كلية إدارة الأعمال
جامعة البحرين

Dear Bank Customer

Recently, many banks in Bahrain have begun offering some banking services through the Internet. As part of a PhD. study examining your opinions about banking on the Internet and the beliefs and attitudes that helped shape these opinions, please find enclosed a copy of a questionnaire targeting all banking services users in Bahrain.

With the results of this survey, I hope to gain a better understanding of how Internet banking services can best be utilized and presented to provide the service sought by customers.

The success of this survey depends on your participation and candid responses. I would therefore greatly appreciate your assistance in completing the attached questionnaire. Please be assured that your responses will be kept strictly confidential. Individual participants will not be identified in the analysis as only aggregate results will be analyzed and presented.

If you have any queries, please do not hesitate to contact me by email at larahman@buss.uob.bh

Thank you for your participation.

Latifa A Abdulrahman Mohamed
College of Business Administration
University of Bahrain

ONLINE BANKING QUESTIONNAIRE

This questionnaire will present you with a number of questions about your perceptions and attitudes toward online banking services provided by commercial banks in Bahrain.

1 How long have you been using the Internet?

- □ Never
- □ Less than one month
- □ 1 month- less than 6 months
- □ 6 months – less than one year
- □ 1 year – less than 2 years
- □ 2 years and more

2 On average, how frequently do you use the Internet?

- □ Never
- □ 1 – 2 times a week
- □ 3 - 4 times a week
- □ 5 – 6 times a week
- □ Everyday of the week

3 Where do you usually access the Internet from? (Please select as many as applicable)

- □ I do not use the Internet
- □ Home
- □ Workplace
- □ School
- □ Cyber café
- □ Other (Please specify) _____

4 How would you rate the internet connection speed that you currently use?

- □ I do not use the Internet
- □ Very slow
- □ Slow
- □ Moderate
- □ Fast
- □ Very fast

5 Do you think that banks should invest more in promoting their online banking services to encourage customers to use them?

- □ Yes
- □ No
- □ I do not know

6 How often do you use the online banking services from your home/workplace/school?

- □ Never
- □ 1 – 2 times a week
- □ 3 - 4 times a week
- □ 5 – 6 times a week
- □ Everyday of the week

7 How would you be **interested** in using online banking if it is available?

- □ I am already a user
- □ I would most certainly be interested
- □ I would be very interested
- □ I would be interested
- □ I maybe interested
- □ I would not be interested
- □ I would not be interested at all

8 **Name of Bank(s) with which you transact**

9 Suppose that online banking services were available to you, **how likely would you become a regular user**?

(a) □**I am already a user** *(If already a user, please go to Question 16; if not, rate either **b**, **c** or **d**)*

(b) in the next 1 – 6 months

Very Unlikely □1 □2 □3 □4 □5 □6 □7 Very Likely

(c) in the next 7 – 12 months

Very Unlikely □1 □2 □3 □4 □5 □6 □7 Very Likely

(d) in the next 13 – 18 months

Very Unlikely □1 □2 □3 □4 □5 □6 □7 Very Likely

10 Please indicate the **extent** to which you **use the Internet** to perform the following tasks

(Please circle one for each statement)

(a) Gathering information

Not at all □1 □2 □3 □4 □5 □6 □7 To a great extent

(b) Communication (e.g. email, chat, etc.)

Not at all □1 □2 □3 □4 □5 □6 □7 To a great extent

(c) Downloading free software

Not at all □1 □2 □3 □4 □5 □6 □7 To a great extent

(d) Shopping

Not at all □1 □2 □3 □4 □5 □6 □7 To a great extent

(e) Searching for work

Not at all □1 □2 □3 □4 □5 □6 □7 To a great extent

(g) Other _____

Not at all □1 □2 □3 □4 □5 □6 □7 To a great extent

11 Please indicate the importance of the following criteria to you in choosing the online banking facilities?

(Please circle one for each statement)

(a) The role of **media and advertising** in recommending the use of online banking services

Not at all important □1 □2 □3 □4 □5 □6 □7 Very important

(b) **Familiarity** with the bank

Not at all important □1 □2 □3 □4 □5 □6 □7 Very important

(c) Ownership of the bank is **local**

Not at all important □1 □2 □3 □4 □5 □6 □7 Very important

(d) Ownership of the bank is **international**

Not at all important □1 □2 □3 □4 □5 □6 □7 Very important

(e) **Reputation** of the bank

Not at all important □1 □2 □3 □4 □5 □6 □7 Very important

(f) **Bank employees** are encouraging and helpful

Not at all important □1 □2 □3 □4 □5 □6 □7 Very important

In this section of the questionnaire, please indicate your general attitude toward online banking services provided by commercial banks in Bahrain. The following four questions focus on your attitude toward online banking services. Please rate your feelings about this behaviour using the four sets of adjective scales below the statement.

12 All things considered, I do believe that using online banking is: **(Please circle one for each)**

(a) **A Good idea**	□1	□2	□3	□4	□5	□6	□7	**A Bad idea**
(b) **Wise**	□1	□2	□3	□4	□5	□6	□7	**Foolish**
(c) **Favourable**	□1	□2	□3	□4	□5	□6	□7	**Unfavourable**
(d) **Beneficial**	□1	□2	□3	□4	□5	□6	□7	**Unbeneficial**

Some of our actions are sometimes influenced by other people such as a spouse, relative, or a friend and what they should think we should do. In this section, we would like to learn about how people who are important to you influence your decision to adopt online banking services. Please select the number which closely responds to your answer.

13 How would you rate the following statements?

(Please circle one for each statement, EVEN IF YOU ARE CURRENTLY NOT AN ONLINE USER as these questions deal with your perceptions and what you think about online banking)

(a) My decision to adopt online banking is influenced by my **friends** whose opinion is important to me and they have great influence on my behaviour

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) My decision to adopt online banking is influenced by my **family** whose opinion is important to me and they have great influence on my behaviour

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) My decision to adopt online banking is influenced by my **colleagues/peers** whose opinion is important to me and they have great influence on my behaviour

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

.....

(a) Using online banking services **is completely within my control**

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) I have the **freedom** to use the kind of online banking services I prefer

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) I have the **necessary means and resources** to use online banking services

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

In this section of the questionnaire, we would appreciate your views on how you perceive the ease of use, the usefulness, and the risks of using online banking services compared to the traditional way of banking (visiting the bank to conduct your banking transactions).

(a) I think online banking is an **easy way** to conduct banking transactions

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) I believe online banks in Bahrain provide **easy to follow** instructions on their web sites

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) I think it is **easy to navigate** in the bank site to conduct transactions

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(d) I think learning to use online banking services is **easy** to **me**

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(e) I think using online banking can be **frustrating**

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

.....

(a) I think using online banking gives me **more time and freedom**

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) I think online banking **really works** and it is a good decision to move online

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) Online banking services can be very **useful** to me as a customer

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(d) Online banking can make it **easier** for me to conduct banking transactions

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

How likely do you believe that using the online banking services provided by your bank is associated with the following risks.

(a) I am **confident** over the security aspects of online banking in Bahrain

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) I think my **bank will take appropriate action** as soon as possible to settle any wrong transactions

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) I think my **bank will compensate** me for any fault in my account caused by security breach such as hacking of personal accounts

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(d) **Personal information** regarding my online banking transaction will not be known to others

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(e) **Advances** in Internet security technology provides for safer online banking

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(a) It is important to me to **follow the example of others** who already use online banking

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) It is important to me to **seek others' opinions** about my choice of mode of banking

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

.....

(a) It is important to me to be able to **interact** with other people when I visit the bank branch

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) It is important to me to **use new technologies** which I believe will give me **higher status** among my peers

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) It is important to me to be the first **among my friends** to use new technologies when they are offered

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

.....

(a) I am able to use the Internet **without** the help of others

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) I am **confident** of using online banking even if I have **never used such a system before**

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) I am **confident** of using online banking services if I have only **the online instructions for reference**

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(d) I have the necessary **knowledge and skills** required to use online banking service

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(e) I consider myself as an **experienced** internet user

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(a) The Bahrain Monetary Agency (BMA) acts as a **sound regulating body and controller** of online banking

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(b) There are **no** major **problems** with BATELCO internet services that may affect online banking

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(c) BATELCO internet services are quite **advanced and reliable**

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(d) The **costs of connection** to the Internet are reasonable

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(f) The government of Kingdom of Bahrain **promotes** the use of the Internet for commerce

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

(g) The government of Kingdom of Bahrain is **active** in setting up facilities to enable electronic commerce

Strongly Disagree □1 □2 □3 □4 □5 □6 □7 Strongly agree

14 What do you think banks should do to encourage people to use online banking in Bahrain? (**Tick as many as applicable**)

- □ Increase security measures on their web sites
- □ Educate the customer on the benefits of using online banking through different media tools
- □ Provide services free from technical problems
- □ Improve download speed from host bank server
- □ Improve response time to queries sent via the bank web site
- □ Others (Please specify)

_____

_____

_____

_____

15 Do you think Bahrain is ready for such services? Why? (**Tick as many as applicable**)

- □ Yes, because Bahrain has the infrastructure to provide such services
- □ Yes, because the Bahraini customer is always willing to try new technologies offered
- □ Yes, because Bahrain is a developing society and we pride ourselves on being leaders in the region
- □ Not really, because the culture of Bahrain is not readily acceptable of such technological services
- □ No, because the Internet can never replace the actual visit to the bank and transacting with actual cash
- □ No, because Internet services in Bahrain are full with technical problems
- □ Others (Please specify)

_____

_____

_____

_____

(Personal data)

16 **Gender**: □ Male □ Female

17 **Marital Status** □ Married □ Single

18 **Age group**

□ 18 to 24 years old □ 25 to 29 years old
□ 30 to 34 years old □ 35 to 39 years old
□ 40 to 44 years old □ Above 44 years old

19 **Profession**

□ Student □ Self-employed
□ Professional □ Executive/manager
□ Academic □ Technician
□ Office Worker □ Retiree
□ Housewife □ Other (please specify) _____

20 **Monthly income**

□ Less than BD200 □ BD200 – BD400
□ BD401 – BD600 □ BD601 – BD800
□ BD801- BD1000 □ Above BD1000

21 **What is your highest level of education attained**?

□ Primary School Leaving Certificate
□ Intermediate School Leaving Certificate
□ Secondary School Leaving Certificate
□ University/College 1 – 4 years
□ University/College 5 years or more
□ Professional degree (e.g. .C.P.A, C.P.Eng., etc)

Thank you very much for your time and effort.
Please contact me for any queries on: larahman@buss.uob.bh

استبيان حول استخدام الخدمات المصرفية الإلكترونية في البحرين

بيانات شخصية

(1) الجنس

□أنثى □ذكر

(2) الحالة الاجتماعية

□ متزوج □ أعزب

(3) الفئة العمرية

□ 18 – 24 سنة
□ 25 – 29 سنة
□ 30 – 34 سنة
□ 35 – 39 سنة
□ 40- 44 سنة
□ أكبر من 44 سنة

(4) المهنة:

□ طالب/طالبة
□ أعمال حرة
□ مهني/مهنية
□ مدير/مديرة
□ أكاديمي/أكاديمية
□ فني/فنية
□ موظف/موظفة مكتب
□ متقاعد/متقاعدة
□ ربة منزل
□ أخرى (الرجاء التحديد)

_____

(5) الدخل الشهري

□أقل من 200 دينار
□ 401 – 600 دينار
□ 801– 1000 دينار
□200 – 400 دينار
□601 – 800 دينار
□أكثر من 1000 دينار

(6) ما هو أعلى مستوى تعليم حصلت عليه؟

□ الشهادة الابتدائية
□ الشهادة الإعدادية
□ الشهادة الثانوية
□ تعليم جامعي من 1- 4 سنوات
□ تعليم جامعي 5 سنوات أو أكثر
□ شهادات مهنية احترافية

(7) ما اسم البنك الذي تتعامل معه

(8) **منذ متى** وأنت تستخدم شبكة المعلومات (الإنترنت)؟

□ لا استخدم الإنترنت
□ أقل من شهر
□ شهر – أقل من 6 أشهر
□ 6 أشهر – أقل من سنة
□ سنة – أقل من سنتين
□ سنتين أو أكثر

(9) كم **مرة** تستخدم الإنترنت أسبوعيا تقريباً؟

□ لا استخدم الإنترنت
□ 1 – 2 مرات/أسبوعيا
□ 3 – 4 مرات/أسبوعيا
□ 5 – 6 مرات/أسبوعيا
□ كل يوم في الإسبوع

(10) من **أي مكان** تستخدم الإنترنت عادةً؟

□ لا استخدم الإنترنت
□ المنزل
□ العمل
□ مكان الدراسة
□ انترنت كافيه
□ مكان آخر (الرجاء التحديد) _____

(11) كيف تصنف **سرعة الإنترنت** التي تستخدمها حالياً؟

□ لا استخدم الإنترنت
□ بطيئة جداً
□ بطيئة
□ معتدلة
□ سريعة
□ سريعة جداً

(12) كم **يبعد أقرب فرع** للبنك الذي تتعامل معه من مكان سكنك/عملك/دراستك؟

□ بالسيارة _____ دقيقة
□ سيراً _____ دقيقة

(13) هل تعتقد أنه يتوجب على البنوك في البحرين صرف مبالغ أكثر من أجل **ترويج** خدماتهم الإلكترونية للزبائن؟

□ نعم
□ لا
□ لا أعلم

(14) كم **مرة أسبوعياً** تستخدم الخدمات المصرفية الإلكترونية ؟

□ لا استخدم
□ 1 – 2 مرة/اسبوعياً
□ 3 – 4 مرات/اسبوعياً
□ 5 – 6 مرات/اسبوعياً
□ كل يوم في الإسبوع

(15) هل ستكون **راغباً** في استخدام الخدمات المصرفية الإلكترونية لو كانت متاحة لك؟

□أنا مستخدم فعلي حالياً
□بكل تأكيد سأكون راغباً
□سأكون راغباً جداً
□سأكون راغباً
□سأكون راغباً نوعاً ما
□قد أكون راغباً
□لن أكون راغباً
□لن أكون راغباً قطعياً

(16) لنفترض أن الخدمات المصرفية الإلكترونية أصبحت متاحة لك، ما **مدى احتمال استخدامك** لها خلال الفترات التالية:

□أنا مستخدم فعلي حالياً

خلال فترة شهر - 6 أشهر المقبلة

احتمال غير وارد أبداً □1 □2 □3 □4 □5 □6 □7 احتمال وارد جداً

خلال فترة 7 – 12 شهرا المقبلة

احتمال غير وارد أبداً □1 □2 □3 □4 □5 □6 □7 احتمال وارد جداً

خلال فترة 13 – 18 شهراً المقبلة

احتمال غير وارد أبداً □1 □2 □3 □4 □5 □6 □7 احتمال وارد جداً

(17) الرجاء تحديد **المدى الذي تستخدم** فيه الإنترنت للقيام بالأعمال التالية وذلك **بوضع دائرة حول رقم واحد لكل عبارة**

جمع المعلومات

استخدام معدوم □1 □2 □3 □4 □5 □6 □7 استخدام كبير جداً

المراسلات والتواصل (البريد الإلكتروني email ، التحدث Chat ... الخ)

استخدام معدوم □1 □2 □3 □4 □5 □6 □7 استخدام كبير جداً

تنزيل البرامج المجانية

استخدام معدوم □1 □2 □3 □4 □5 □6 □7 استخدام كبير جداً

التسوق عبر الإنترنت

استخدام معدوم □1 □2 □3 □4 □5 □6 □7 استخدام كبير جداً

البحث عن وظائف

استخدام معدوم □1 □2 □3 □4 □5 □6 □7 استخدام كبير جداً

أعمال أخرى (الرجاء التحديد) _____

استخدام معدوم □1 □2 □3 □4 □5 □6 □7 استخدام كبير جداً

(18) الرجاء تحديد **أهمية** العوامل التالية في اتخاذك قرار استخدام الخدمات المصرفية الإلكترونية

(الرجاء الإجابة حتى لو كنت غير مستخدم حالياً)

أهمية وسائل الإعلام والإعلان في الترويج لاستخدام الخدمات المصرفية

غير مهمة أبداً □1 □2 □3 □4 □5 □6 □7 مهمة جداً

المعرفة الجيدة بالبنك

غير مهمة أبداً □1 □2 □3 □4 □5 □6 □7 مهمة جداً

ملكية البنك محلية

غير مهمة أبداً □1 □2 □3 □4 □5 □6 □7 مهمة جداً

ملكية البنك أجنبية

غير مهمة أبداً □1 □2 □3 □4 □5 □6 □7 مهمة جداً

سمعة البنك

غير مهمة أبداً □1 □2 □3 □4 □5 □6 □7 مهمة جداً

تشجيع موظفي البنك واستعدادهم لمساعدتك

غير مهمة أبداً □1 □2 □3 □4 □5 □6 □7 مهمة جداً

(19) بغض النظر عن كل الأشياء الأخرى ، أنا أعتقد **إن قرار استخدام** الخدمات المصرفية الإلكترونية

(الرجاء وضع دائرة حول رقم واحد في كل سطر)

فكرة جيدة **(Good Idea)**	□1	□2	□3	□4	□5	□6	□7	فكرة غير جيدة
قرار حكيم **(Wise)**	□1	□2	□3	□4	□5	□6	□7	قرار غير حكيم
قرار مفضل **(Favourable)**	□1	□2	□3	□4	□5	□6	□7	قرار غير مفضل
قرار مفيد **(Beneficial)**	□1	□2	□3	□4	□5	□6	□7	قرار غير مفيد
قرار ايجابي **(Positive)**	□1	□2	□3	□4	□5	□6	□7	قرار سلبي
قرار رائع **(Terrific)**	□1	□2	□3	□4	□5	□6	□7	قرار سيئ

(20) كيف تقيم موافقتك على العبارات التالية

(الرجاء وضع دائرة حول رقم واحد لكل عبارة)

إن الأشخاص **المهمين** لي يعتقدون بأنه **يجب** أن استخدم الخدمات المصرفية الإلكترونية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن الأشخاص الذين لديهم **تأثير قوي** على قراراتي يعتقدون بأنه يجب أن استخدم الخدمات المصرفية الإلكترونية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن الأشخاص **المهمين** لي **يفضلون** أن استخدم الخدمات المصرفية الإلكترونية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن قراري باستخدام الخدمات المصرفية الإلكترونية **متأثر بقرار أصدقائي** حول هذا الشأن

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن قراري باستخدام الخدمات المصرفية الإلكترونية **متأثر بقرار عائلتي** حول هذا الشأن

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن قراري باستخدام الخدمات المصرفية الإلكترونية **متأثر بقرار أقراني و زملائي** في العمل

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن استخدام الخدمات المصرفية الإلكترونية يقع **تحت سيطرتي الكاملة**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أمتلك **الحرية الكاملة** لاستخدام الخدمات المصرفية الإلكترونية المفضلة لدي

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أمتلك **الموارد و الوسائل** اللازمة لاستخدام الخدمات المصرفية الإلكترونية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن استخدام الخدمات المصرفية الإلكترونية طريقة **سهلة** لانجاز المعاملات البنكية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن البنوك التي تستخدم الخدمات الإلكترونية في البحرين توفر **تعليمات سهلة** لاستخدامها

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن **التنقل** في صفحة البنك الإلكترونية عملية **سهلة**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن **تعلم** استخدام الخدمات الإلكترونية عملية **سهلة** بالنسبة **لي**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن **التعامل** بالخدمات الإلكترونية عملية **سهلة الفهم وواضحة**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن **استخدام** الخدمات المصرفية الإلكترونية **عديم الجدوى**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن استخدام الخدمات المصرفية الإلكترونية يمنحني **حرية أكثر ووقت فراغ أكثر**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد إن الخدمات المصرفية الإلكترونية يعمل بطريقة فعالة وقرار استخدامه **قرار جيد**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

استخدام الخدمات المصرفية الإلكترونية **ملائم لي**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

استخدام الخدمات المصرفية الإلكترونية يمكن أن يكون **مفيد جداً لي كزبون**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

استخدام الخدمات المصرفية الإلكترونية **يسهل** علي عملية انجاز المعاملات البنكية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

استخدام الخدمات المصرفية الإلكترونية **يوفر علي الوقت والجهد**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

يتمتع استخدام الخدمات المصرفية الإلكترونية **بمزايا كثيرة مقارنة بالطرق التقليدية**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن مستوى **الأمن** الذي تقدمه الخدمات المصرفية الإلكترونية **مُرضي**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد أن مصرفي سيتخذ الإجراءات المناسبة **لتصحيح أي عملية خاطئة حال حدوثها**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا أعتقد أن مصرفي سيضمن أن **حسابي لن يتأثر** بسبب أي تدخل في الحاجز الأمني للبنك من قبل قراصنة الإنترنت

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

أنا واثق من جميع **الواجهات الأمنية** للخدمات المصرفية الإلكترونية في البحرين

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن **معلوماتي الشخصية** لن تصبح متداولة لدى الجميع بسبب استخدامي الخدمات المصرفية الإلكترونية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن **التطورات التقنية الحديثة** في عالم الإنترنت تؤمن **بيئة آمنة** لاستخدام الخدمات المصرفية الإلكترونية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إنه من المهم عندي أن **أعمل مثل الآخرين** الذين قاموا باستخدام الخدمات المصرفية الإلكترونية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إنه من المهم عندي أن **أستشف آراء الآخرين** حول أفضل طريقة لاستخدام الخدمات المصرفية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إنه من المهم عندي **أن أقابل وأتحدث** مع أناساً آخرين لدى زيارتي للبنك
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إنه من المهم عندي أن **أسأل النصح** من أصدقائي وأقاربي حول استخدام الخدمات المصرفية الإلكترونية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إنه من المهم عندي أن استخدم **أحدث التقنيات** مما يجعلني حسب ما أعتقد **متفوقاً** على أقراني
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إنه من المهم عندي أن أكون من **أوائل مستخدمي** التقنيات الحديثة المطروحة في الأسواق
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

انا استطيع استخدام الإنترنت من **دون أي مساعدة** من الغير
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

انا واثق من قدرتي على استخدام الخدمات المصرفية الإلكترونية حتى لو **لم أكن قد استخدمت نظاماً مشابهاً من قبل**
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

انا واثق من قدرتي على استخدام الخدمات المصرفية الإلكترونية في **حال تواجد التعليمات على الموقع فقط**
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

انا أمتلك **المعرفة والمهارات الكافية** التي تمكنني من استخدام الخدمات المصرفية الإلكترونية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

انا استطيع **تصنيف** نفسي على أنني **مستخدم ماهر للإنترنت**
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن **مؤسسة نقد البحرين** تقوم بعملها بكل كفاءة في مجال **تنظيم** استخدام الخدمات الإلكترونية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

لا توجد **أية مشاكل** رئيسية في خدمات شركة **بتلكو** مما يعيق استخدام الخدمات المصرفية الإلكترونية
لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن خدمات شركة **بتلكو متقدمة** تقنياً ويمكن الاعتماد عليها

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن **أجرة** استخدام الإنترنت في البحرين **معقولة**

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن استخدام **الطريقة التقليدية** في انجاز المعاملات المصرفية **يكلف أكثر** من الخدمات الإلكترونية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

تقوم **حكومة** مملكة البحرين **بالترويج** لاستخدام الإنترنت للتجارة الإلكترونية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

إن **حكومة** مملكة البحرين لها دور فعال **في توفير الإمكانيات** لتسهيل التجارة الإلكترونية

لا أوافق أبداً □1 □2 □3 □4 □5 □6 □7 أوافق جداً

(21) ماذا تعتقد أنه يتوجب على المصارف في البحرين القيام به لتشجيع الزبائن على استخدام الخدمات المصرفية الإلكترونية

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(22) هل تعتقد أن البحرين مستعدة لتبني مثل هذه الخدمات ؟ ولماذا؟

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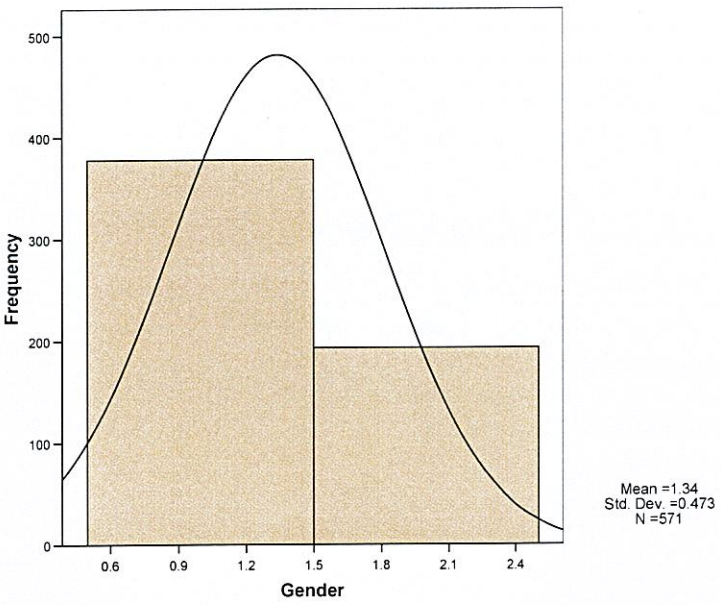
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مع جزيل الشكر والتقدير لمساعدتكم في انجاح هذا الإستبيان

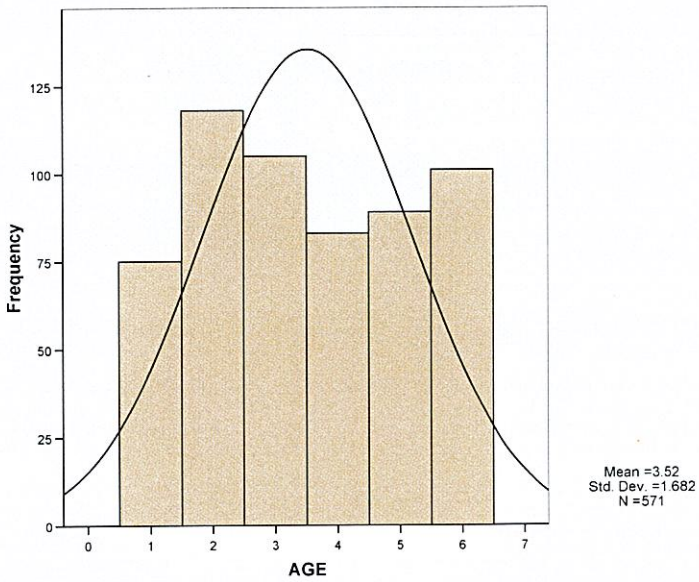
APPENDIX 3

STATISTICS

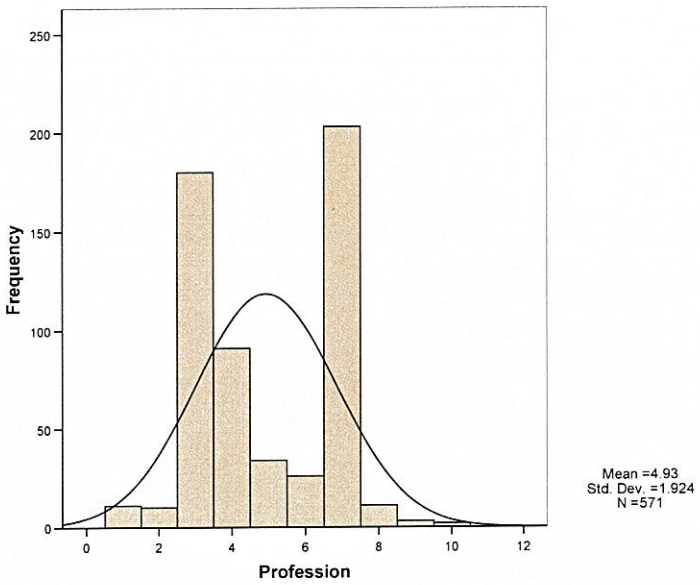
Frequency Distributions (Demographics)
Post Hoc Tables
Correlation Table
Frequency Tables



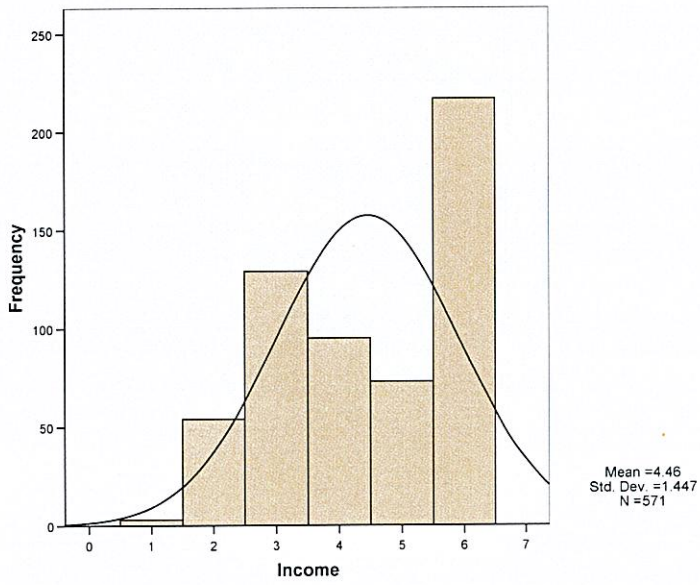
Frequency Distribution of Gender Variable



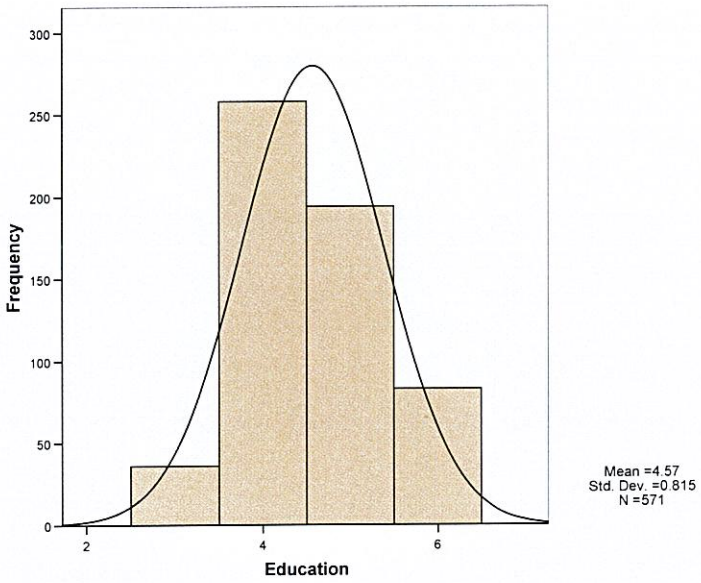
Frequency Distribution of Age Variable



Frequency Distribution of Profession Variable



Frequency Distribution of Level of Income Variable



Frequency Distribution of Level of Education Variable

POST HOC TABLES

Multiple Comparisons

Dependent Variable	(I) Age Group	(J) Age Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Use Internet for gathering information	18-24 years	25-29 years	.254	.277	.974	-.67	1.18
		30-34 years	.648	.284	.391	-.30	1.59
		35-39 years	.928	.299	.088	-.07	1.93
		40-44 years	.876	.294	.116	-.11	1.86
		Above 44	1.327(*)	.286	.001	.37	2.28
	25-29 years	18-24 years	-.254	.277	.974	-1.18	.67
		30-34 years	.393	.252	.785	-.45	1.23
		35-39 years	.673	.269	.281	-.22	1.57
		40-44 years	.622	.263	.350	-.26	1.50
		Above 44	1.072(*)	.254	.004	.22	1.92
	30-34 years	18-24 years	-.648	.284	.391	-1.59	.30
		25-29 years	-.393	.252	.785	-1.23	.45
		35-39 years	.280	.275	.960	-.64	1.20
		40-44 years	.229	.270	.982	-.67	1.13
		Above 44	.679	.261	.242	-.19	1.55
	35-39 years	18-24 years	-.928	.299	.088	-1.93	.07
		25-29 years	-.673	.269	.281	-1.57	.22
		30-34 years	-.280	.275	.960	-1.20	.64
		40-44 years	-.051	.286	1.000	-1.01	.90
		Above 44	.399	.278	.840	-.53	1.33
	40-44 years	18-24 years	-.876	.294	.116	-1.86	.11
		25-29 years	-.622	.263	.350	-1.50	.26
		30-34 years	-.229	.270	.982	-1.13	.67
		35-39 years	.051	.286	1.000	-.90	1.01
		Above 44	.450	.273	.742	-.46	1.36
	Above 44	18-24 years	-1.327(*)	.286	.001	-2.28	-.37
		25-29 years	-1.072(*)	.254	.004	-1.92	-.22
		30-34 years	-.679	.261	.242	-1.55	.19
		35-39 years	-.399	.278	.840	-1.33	.53
		40-44 years	-.450	.273	.742	-1.36	.46
Use Internet for communication	18-24 years	25-29 years	-.124	.290	.999	-1.09	.84
		30-34 years	.510	.296	.705	-.48	1.50
		35-39 years	.243	.312	.988	-.80	1.29
		40-44 years	-.188	.307	.996	-1.21	.84
		Above 44	.401	.299	.876	-.60	1.40
	25-29 years	18-24 years	.124	.290	.999	-.84	1.09
		30-34 years	.635	.263	.326	-.24	1.51
		35-39 years	.367	.281	.888	-.57	1.30
		40-44 years	-.064	.275	1.000	-.98	.86
		Above 44	.525	.266	.564	-.36	1.41
	30-34 years	18-24 years	-.510	.296	.705	-1.50	.48

		25-29 years	-.635	.263	.326	-1.51	.24
		35-39 years	-.268	.288	.973	-1.23	.69
		40-44 years	-.698	.283	.297	-1.64	.25
		Above 44	-.109	.273	.999	-1.02	.80
	35-39 years	18-24 years	-.243	.312	.988	-1.29	.80
		25-29 years	-.367	.281	.888	-1.30	.57
		30-34 years	.268	.288	.973	-.69	1.23
		40-44 years	-.431	.299	.839	-1.43	.57
		Above 44	.158	.291	.998	-.81	1.13
	40-44 years	18-24 years	.188	.307	.996	-.84	1.21
		25-29 years	.064	.275	1.000	-.86	.98
		30-34 years	.698	.283	.297	-.25	1.64
		35-39 years	.431	.299	.839	-.57	1.43
		Above 44	.589	.285	.512	-.36	1.54
	Above 44	18-24 years	-.401	.299	.876	-1.40	.60
		25-29 years	-.525	.266	.564	-1.41	.36
		30-34 years	.109	.273	.999	-.80	1.02
		35-39 years	-.158	.291	.998	-1.13	.81
		40-44 years	-.589	.285	.512	-1.54	.36
Use Internet for downloading free software	18-24 years	25-29 years	.163	.299	.998	-.84	1.16
		30-34 years	.440	.306	.840	-.58	1.46
		35-39 years	1.186(*)	.323	.020	.11	2.26
		40-44 years	1.206(*)	.318	.014	.15	2.27
		Above 44	1.267(*)	.309	.005	.24	2.30
	25-29 years	18-24 years	-.163	.299	.998	-1.16	.84
		30-34 years	.277	.272	.959	-.63	1.19
		35-39 years	1.024(*)	.290	.030	.05	1.99
		40-44 years	1.043(*)	.284	.021	.09	1.99
		Above 44	1.104(*)	.275	.007	.19	2.02
	30-34 years	18-24 years	-.440	.306	.840	-1.46	.58
		25-29 years	-.277	.272	.959	-1.19	.63
		35-39 years	.746	.298	.281	-.25	1.74
		40-44 years	.766	.292	.232	-.21	1.74
		Above 44	.827	.282	.129	-.12	1.77
	35-39 years	18-24 years	-1.186(*)	.323	.020	-2.26	-.11
		25-29 years	-1.024(*)	.290	.030	-1.99	-.05
		30-34 years	-.746	.298	.281	-1.74	.25
		40-44 years	.019	.309	1.000	-1.01	1.05
		Above 44	.081	.300	1.000	-.92	1.08
	40-44 years	18-24 years	-1.206(*)	.318	.014	-2.27	-.15
		25-29 years	-1.043(*)	.284	.021	-1.99	-.09
		30-34 years	-.766	.292	.232	-1.74	.21
		35-39 years	-.019	.309	1.000	-1.05	1.01
		Above 44	.062	.295	1.000	-.92	1.05
	Above 44	18-24 years	-1.267(*)	.309	.005	-2.30	-.24
		25-29 years	-1.104(*)	.275	.007	-2.02	-.19
		30-34 years	-.827	.282	.129	-1.77	.12
		35-39 years	-.081	.300	1.000	-1.08	.92

		40-44 years	-.062	.295	1.000	-1.05	.92
Use Internet for shopping	18-24 years	25-29 years	.427	.272	.783	-.48	1.34
		30-34 years	.625	.279	.414	-.31	1.56
		35-39 years	1.267(*)	.294	.003	.29	2.25
		40-44 years	.733	.289	.268	-.23	1.70
		Above 44	1.183(*)	.281	.004	.24	2.12
	25-29 years	18-24 years	-.427	.272	.783	-1.34	.48
		30-34 years	.198	.247	.986	-.63	1.02
		35-39 years	.840	.264	.074	-.04	1.72
		40-44 years	.307	.259	.924	-.56	1.17
		Above 44	.757	.250	.105	-.08	1.59
	30-34 years	18-24 years	-.625	.279	.414	-1.56	.31
		25-29 years	-.198	.247	.986	-1.02	.63
		35-39 years	.642	.271	.346	-.26	1.55
		40-44 years	.109	.266	.999	-.78	1.00
		Above 44	.559	.257	.452	-.30	1.42
	35-39 years	18-24 years	-1.267(*)	.294	.003	-2.25	-.29
		25-29 years	-.840	.264	.074	-1.72	.04
		30-34 years	-.642	.271	.346	-1.55	.26
		40-44 years	-.534	.281	.610	-1.47	.41
		Above 44	-.084	.273	1.000	-1.00	.83
	40-44 years	18-24 years	-.733	.289	.268	-1.70	.23
		25-29 years	-.307	.259	.924	-1.17	.56
		30-34 years	-.109	.266	.999	-1.00	.78
		35-39 years	.534	.281	.610	-.41	1.47
		Above 44	.450	.268	.728	-.45	1.35
	Above 44	18-24 years	-1.183(*)	.281	.004	-2.12	-.24
		25-29 years	-.757	.250	.105	-1.59	.08
		30-34 years	-.559	.257	.452	-1.42	.30
		35-39 years	.084	.273	1.000	-.83	1.00
		40-44 years	-.450	.268	.728	-1.35	.45
Use Internet for work search	18-24 years	25-29 years	.560	.297	.616	-.43	1.55
		30-34 years	.406	.304	.878	-.61	1.42
		35-39 years	1.030	.320	.068	-.04	2.10
		40-44 years	.625	.315	.560	-.43	1.68
		Above 44	.900	.307	.128	-.12	1.92
	25-29 years	18-24 years	-.560	.297	.616	-1.55	.43
		30-34 years	-.154	.270	.997	-1.06	.75
		35-39 years	.470	.288	.751	-.49	1.43
		40-44 years	.065	.282	1.000	-.88	1.01
		Above 44	.340	.273	.906	-.57	1.25
	30-34 years	18-24 years	-.406	.304	.878	-1.42	.61
		25-29 years	.154	.270	.997	-.75	1.06
		35-39 years	.624	.295	.485	-.36	1.61
		40-44 years	.219	.290	.989	-.75	1.19
		Above 44	.494	.280	.684	-.44	1.43

	35-39 years	18-24 years	-1.030	.320	.068	-2.10	.04
		25-29 years	-.470	.288	.751	-1.43	.49
		30-34 years	-.624	.295	.485	-1.61	.36
		40-44 years	-.405	.307	.883	-1.43	.62
		Above 44	-.131	.298	.999	-1.13	.86
	40-44 years	18-24 years	-.625	.315	.560	-1.68	.43
		25-29 years	-.065	.282	1.000	-1.01	.88
		30-34 years	-.219	.290	.989	-1.19	.75
		35-39 years	.405	.307	.883	-.62	1.43
		Above 44	.275	.292	.971	-.70	1.25
	Above 44	18-24 years	-.900	.307	.128	-1.92	.12
		25-29 years	-.340	.273	.906	-1.25	.57
		30-34 years	-.494	.280	.684	-1.43	.44
		35-39 years	.131	.298	.999	-.86	1.13
		40-44 years	-.275	.292	.971	-1.25	.70
Use Internet for other	18-24 years	25-29 years	-.166	.303	.998	-1.18	.85
		30-34 years	-.305	.310	.965	-1.34	.73
		35-39 years	-.059	.327	1.000	-1.15	1.03
		40-44 years	.087	.322	1.000	-.99	1.16
		Above 44	.227	.313	.991	-.82	1.27
	25-29 years	18-24 years	.166	.303	.998	-.85	1.18
		30-34 years	-.139	.275	.998	-1.06	.78
		35-39 years	.107	.294	1.000	-.88	1.09
		40-44 years	.252	.288	.979	-.71	1.22
		Above 44	.393	.278	.850	-.54	1.32
	30-34 years	18-24 years	.305	.310	.965	-.73	1.34
		25-29 years	.139	.275	.998	-.78	1.06
		35-39 years	.246	.302	.985	-.76	1.25
		40-44 years	.392	.296	.882	-.60	1.38
		Above 44	.532	.286	.631	-.42	1.49
	35-39 years	18-24 years	.059	.327	1.000	-1.03	1.15
		25-29 years	-.107	.294	1.000	-1.09	.88
		30-34 years	-.246	.302	.985	-1.25	.76
		40-44 years	.146	.313	.999	-.90	1.19
		Above 44	.286	.304	.971	-.73	1.30
	40-44 years	18-24 years	-.087	.322	1.000	-1.16	.99
		25-29 years	-.252	.288	.979	-1.22	.71
		30-34 years	-.392	.296	.882	-1.38	.60
		35-39 years	-.146	.313	.999	-1.19	.90
		Above 44	.140	.299	.999	-.86	1.14
	Above 44	18-24 years	-.227	.313	.991	-1.27	.82
		25-29 years	-.393	.278	.850	-1.32	.54
		30-34 years	-.532	.286	.631	-1.49	.42
		35-39 years	-.286	.304	.971	-1.30	.73
		40-44 years	-.140	.299	.999	-1.14	.86

* The mean difference is significant at the .05 level.

		AGE	INC	EDU	ATT	SN	PBC	PEO	PU	PR	INTI	EXTI	CUL	SE	FC
AGE	Pearson Corr.														
	Sig. (2-tailed)														
INC	Pearson Corr.	.434(**)													
	Sig. (2-tailed)	.000													
EDU	Pearson Corr.	.009	.305(**)												
	Sig. (2-tailed)	.830	.000												
ATT	Pearson Corr.	-.105(*)	.159(**)	.072											
	Sig. (2-tailed)	.012	.000	.084											
SN	Pearson Corr.	-.083(*)	-.129(**)	-.134(**)	-.187(**)										
	Sig. (2-tailed)	.048	.002	.001	.000										
PBC	Pearson Corr.	.078	.100(*)	.031	.274(**)	-.145(**)									
	Sig. (2-tailed)	.063	.017	.459	.000	.000									
PEU	Pearson Corr.	.025	.088(*)	.036	.322(**)	-.135(**)	.482(**)								
	Sig. (2-tailed)	.548	.036	.385	.000	.001	.000								
PU	Pearson Corr.	-.066	.126(**)	.061	.400(**)	-.097(*)	.522(**)	.628(**)							
	Sig. (2-tailed)	.113	.003	.148	.000	.021	.000	.000							
PR	Pearson Corr.	-.027	-.040	-.097(*)	.176(**)	-.001	.418(**)	.503(**)	.471(**)						
	Sig. (2-tailed)	.512	.345	.021	.000	.990	.000	.000	.000						
INTI	Pearson Corr.	.003	-.138(**)	-.158(**)	.008	.250(**)	.126(**)	.121(**)	.206(**)	.295(**)					
	Sig. (2-tailed)	.944	.001	.000	.850	.000	.003	.004	.000	.000					
EXTI	Pearson Corr.	-.030	-.096(*)	-.035	.099(*)	.057	.312(**)	.221(**)	.256(**)	.131(**)	.210(**)				
	Sig. (2-tailed)	.471	.022	.399	.017	.173	.000	.000	.000	.002	.000				
CUL	Pearson Corr.	-.018	-.177(**)	-.134(**)	.040	.164(**)	.133(**)	.210(**)	.217(**)	.334(**)	.589(**)	.214(**)			
	Sig. (2-tailed)	.676	.000	.001	.336	.000	.001	.000	.000	.000	.000	.000			
SE	Pearson Corr.	-.191(**)	.164(**)	.188(**)	.356(**)	-.090(*)	.468(**)	.488(**)	.623(**)	.348(**)	.089(*)	.144(**)	.132(**)		
	Sig. (2-tailed)	.000	.000	.000	.000	.032	.000	.000	.000	.000	.033	.001	.002		
FC	Pearson Corr.	-.031	-.049	-.055	.059	.101(*)	.172(**)	.255(**)	.138(**)	.416(**)	.132(**)	.073	.208(**)	.119(**)	
	Sig. (2-tailed)	.453	.240	.193	.161	.016	.000	.000	.001	.000	.002	.080	.000	.004	
BI	Pearson Corr.	-.003	.200(**)	.080	.275(**)	-.128(**)	.261(**)	.281(**)	.393(**)	.340(**)	.012	.047	.035	.327(**)	.072
	Sig. (2-tailed)	.934	.000	.056	.000	.002	.000	.000	.000	.000	.770	.262	.410	.000	.084
	N	571	571	571	571	571	571	571	571	571	571	571	571	571	571

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

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

Mean and Frequency Distribution of Intention to Use Internet

	Description	N	Percentage
1	Already Users	303	53.1
2	Non Users	268	46.9
	Total	571	100

					Frequency Distribution of Responses For Likelihood of Non Users' Intention to Adopt						
Suppose that online banking services were available to you, how likely would you become a regular user?											
Item	Statement	N	Mean	SD	Very Unlikely						Very Likely
2	In the next 1-6 months	172	1.52	2.543	13	13	7	27	30	25	57
3	In the next 7-12 months	44	0.32	1.185	1	8	6	9	12	5	3
4	In the next 13–18 months	52	0.34	1.236	10	6	8	13	2	5	8
	Total	268									

Mean and Frequency Distribution of Attitude Toward Use of Online Banking

					Frequency Distribution of Responses %						
All things considered, I do believe that using online banking is											
Item	Statement	N	Mean	SD	Extremely	Quite	Slightly	Neither	Slightly	Quite	Extremely
					Good Idea						Bad Idea
1	A good idea	571	2.10	1.744	62.7	10.7	6.3	5.8	6.5	5.3	2.8
					Wise						Foolish
2	Wise	571	2.35	1.640	45.7	18.7	12.3	9.8	7.5	3.7	2.3
					Favourable						Unfavourable
3	Favourable	571	2.33	1.664	49.2	15.9	10.0	10.3	7.7	6.0	0.9
					Beneficial						Unbeneficial
4	Beneficial	571	2.33	1.776	56.2	14.5	6.5	7.2	6.3	6.7	2.6

Items scored extremely good idea/wise/favourable/beneficial (1) to extremely bad idea/foolish/unfavourable/unbeneficial (7)

Mean and Frequency Distribution of Tasks for which the Internet is Used

					Frequency Distribution of Responses %						
Please indicate the extent to which you use the internet to perform the following tasks											
Item	Statement	N	Mean	SD	Not At All						To a Great Extent
1	Gathering information	571	5.32	1.919	6.8	5.3	7.2	9.5	13.8	15.8	41.5
2	Communication (e.g. email, chat, etc)	571	5.37	1.971	8.4	4.0	7.4	7.7	11.0	17.3	44.1
3	Downloading free software	571	3.61	2.083	21.7	15.9	13.7	14.4	12.1	7.4	14.9
4	Shopping	571	2.81	1.883	36.6	17.5	12.4	11.6	10.2	6.3	5.3
5	Searching for work	570	2.59	2.028	48.3	15.6	5.6	11.0	6.7	3.2	9.5
6	Other	570	2.31	2.053	62.7	7.9	5.1	6.5	5.1	2.8	9.8

Items scored 'Not At All' (1) to 'To a Great Extent' (7)

Mean and Frequency Distribution of Importance of External Influences on Online Banking Adoption

					Frequency Distribution of Responses %						
Please indicate the importance of the following criteria to you in choosing the online banking facilities											
Item	Statement	N	Mean	SD	Not At All Important						Very Important
1	The role of media and advertising in recommending the use of online banking services	571	5.24	1.755	3.7	4.6	9.3	15.8	16.6	13.3	36.8
2	Familiarity with the bank	571	5.49	1.648	2.6	4.4	7.2	9.8	18.0	18.7	39.2
3	Ownership of the bank is local	571	4.06	2.103	19.4	8.6	9.8	18.4	15.1	10.2	18.6
4	Ownership of the bank is international	571	3.87	3.620	23.3	8.8	11.4	19.6	13.1	11.0	12.6
5	Reputation of the bank	571	5.98	1.624	4.4	2.6	1.9	7.0	8.2	17.7	58.1
6	Bank employees are encouraging and helpful	571	5.72	1.635	3.5	1.8	5.3	12.6	11.9	15.6	49.4

Items scored 'Not At All Important' (1) to 'Very Important' (7)

Mean and Frequency Distribution of Subjective Norms

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	My decision to adopt online banking is influenced by my friends whose opinion is important to me and they have great influence on my behaviour	571	2.68	1.880	42.6	13.5	12.6	12.3	7.4	7.2	4.6
2	My decision to adopt online banking is influenced by my family whose opinion is important to me and they have great influence on my behaviour	571	2.82	1.949	40.3	13.7	10.5	13.1	9.1	7.9	5.4
3	My decision to adopt online banking is influenced by m colleagues/peers whose opinion is important to me and they have great influence on my behaviour	571	2.87	1.942	39.9	12.3	9.5	16.3	8.6	8.6	4.9

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

Mean and Frequency Distribution of Influence of Perceived Behavioural Control

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	Using online banking services is completely within my control	571	5.61	1.846	5.1	5.8	5.1	7.5	10.3	16.3	49.9
2	I have the freedom to use the kind of online banking services I prefer	571	5.76	1.714	3.3	4.7	5.6	6.8	10.0	17.2	52.4
3	I have the necessary means and resources to use online banking services	571	5.57	1.726	3.7	3.2	8.2	10.0	13.0	15.9	46.1

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

Mean and Frequency Distribution of Perceived Ease of Use of Online Banking

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	I think online banking is an easy way to conduct banking transactions	571	5.65	1.654	4.2	3.2	3.3	10.2	15.1	20.0	44.1
2	I believe online banks in Bahrain provide easy to follow instructions on their web sites	571	4.72	1.722	4.9	7.4	10.7	20.3	21.5	14.9	20.3
3	I think it is easy to navigate in the bank site to conduct transactions	571	4.91	1.640	4.6	5.3	8.4	16.8	26.1	18.9	20.0
4	I think learning to use online banking services is easy to me	571	5.74	1.515	1.2	3.2	6.5	10.7	10.3	24.5	43.6
5	I think using online banking can be frustrating	571	2.57	1.757	41.3	18.0	10.9	13.0	9.1	4.2	3.5

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

Mean and Frequency Distribution of Perceived Usefulness

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	I think using online banking gives me more time and freedom	571	5.60	1.641	3.3	4.9	2.8	11.2	13.3	24.3	40.1
2	I think online banking really works and it is a good decision to move online	571	5.63	1.520	3.2	1.2	6.3	9.5	15.1	28.4	36.4
3	Online banking services can be very useful to me as a customer	571	5.83	1.496	2.6	2.3	3.9	8.2	11.9	26.3	44.8
4	Online banking can make it easier for me to conduct banking transactions	571	5.75	1.444	1.8	2.3	5.3	7.5	16.6	26.3	40.3

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

Mean and Frequency Distribution of Security Issues

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	I am confident over the security aspects of online banking in Bahrain	571	4.42	1.772	6.0	11.4	11.9	23.5	15.8	15.9	15.6
2	I think my bank will take appropriate action as soon as possible to settle any wrong transactions	571	4.64	1.731	5.3	8.8	10.7	20.1	18.6	20.1	16.5
3	I think my bank will compensate me for any fault in my account caused by security breach such as hacking of personal accounts	571	4.24	1.876	10.0	12.3	12.1	18.9	17.0	15.8	14.0
4	Personal information regarding my online banking transaction will not be known to others	571	4.75	1.817	6.3	7.4	10.0	21.4	13.3	19.8	21.9
5	Advances in internet security technology provides for safer online banking	571	4.87	1.715	5.6	5.1	10.5	16.5	20.1	22.4	19.8

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

Mean and Frequency Distribution of Interpersonal Influences

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	It is important to me to follow the example of others who already use online banking	571	4.13	2.075	17.9	10.3	8.4	14.9	17.3	15.4	15.8
2	It is important to me to seek others' opinions about my choice of mode of banking	571	4.40	1.966	12.3	9.6	9.1	16.3	18.0	17.3	17.3

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

Mean and Frequency Distribution of Cultural Influences

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	it is important to me to be able to interact with other people when I visit the bank branch	571	4.23	2.026	13.1	13.3	9.3	16.5	15.8	14.0	18.0
2	It is important to me to use new technologies which I believe will give me higher status among my peers	571	4.55	2.068	14.4	7.4	7.2	14.4	16.3	17.9	22.6
3	It is important to me to be the first among my friends to use new technologies when they are offered	571	4.07	2.067	17.3	11.7	8.1	18.7	14.5	13.0	16.6

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

Mean and Frequency Distribution of Self Efficacy Influences

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	I am able to use the internet without the help of others	571	5.67	1.698	3.3	4.6	5.3	9.6	10.2	20.3	46.8
2	I am confident of using online banking even if I have never used such a system before	571	5.12	1.716	4.0	6.0	8.1	13.8	19.6	20.8	27.7
3	I am confident of using online banking services if I have only the online instructions for reference	571	5.24	1.714	4.4	4.7	6.5	14.9	16.6	21.9	31.0
4	I have the necessary knowledge and skills required to use online banking services	571	5.53	1.628	3.0	3.9	6.3	10.0	16.1	22.8	38.0
5	I consider myself as an experienced internet user	571	5.01	1.744	6.0	5.4	5.8	16.8	21.7	19.3	25.0

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

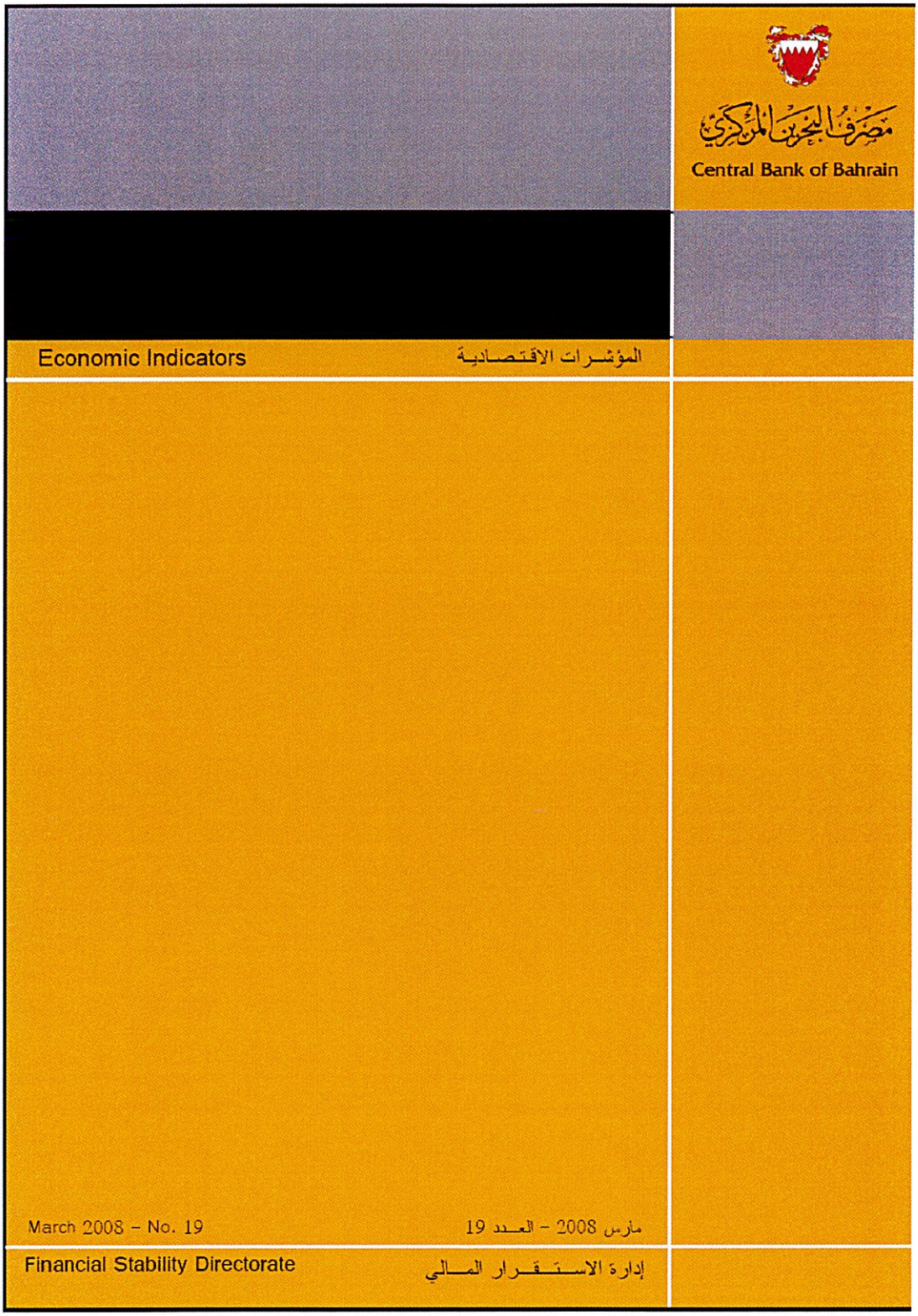
Mean and Frequency Distribution of Facilitating Conditions Influences

					Frequency Distribution of Responses %						
How would you rate the following statements											
Item	Statement	N	Mean	SD	Strongly Disagree						Strongly Agree
1	The Bahrain Monetary Agency (BMA) acts as a sound regulating body and controller of online banking	571	4.43	1.672	7.2	6.7	12.8	22.2	24.5	14.2	12.4
2	There are no major problems with BATELCO internet services that may affect online banking	571	3.78	1.859	17.5	13.0	9.6	18.9	21.9	12.6	6.5
3	BATELCO internet services are quite advanced and reliable	571	3.85	1.782	13.8	13.1	11.9	22.4	19.3	12.8	6.7
4	The cost of connection to the internet are reasonable	571	2.46	1.814	48.5	14.4	10.2	8.6	8.9	6.7	2.8
5	The government of Kingdom of Bahrain promotes the use of the internet for commerce	571	3.67	1.954	19.3	13.8	14.5	17.0	12.8	13.5	9.1
6	The government of Kingdom of Bahrain is active in setting up facilities to enable electronic commerce	571	3.81	1.941	16.8	15.1	11.2	17.0	17.5	12.4	10.0

Items scored 'Strongly Disagree' (1) to 'Strongly Agree' (7)

APPENDIX 4

NATIONAL STATISTICS


مصرف البحرين المركزي
Central Bank of Bahrain
Economic Indicators
المؤشرات الاقتصادية
March 2008 – No. 19
مارس 2008 – العدد 19
Financial Stability Directorate
إدارة الاستقرار المالي

ملخص المؤشرات الاقتصادية
Summary of Main Economic Indicators

	2006	2007	2007 Q1	2007 Q2	2007 Q3	2007 Q4	2008 Q1
السكان والقوى العاملة							
Population and Employment							
Total Population	742,561	1,046,814					
Total Employment	351,862	379,471	381,126	392,147	397,918	379,471	410,162
الإنتاج المحلي							
Domestic Output							
GDP at Current Prices (BD Millions)	5,951.3						
GDP per Capita (BD)	6,090.4						
Crude Oil Production (US Barrels Thousands)	66,908	67,262	16,606	16,857	16,962	16,837	16,543
المالية الحكومية والدين العام المحلي							
Public Finance and Domestic Public Debt							
Revenues (BD Millions)	1,839.6						
Expenditures (BD Millions)	1,558.5						
Surplus/Deficit (BD Millions)	141.6						
Domestic Public Debt (BD Millions)	679.1	816.6	565.1	545.0	520.0	616.6	634.6
As % of GDP	11.4	10.4	9.5	9.2	8.7	10.4	10.7
الأسعار							
Prices							
Consumer Price Index	109.3	103.3	102.1	102.6	103.9	104.4	104.9
Nominal Effective Exchange Rate							
القطاع الخارجي							
External Sector							
Trade Balance (BD Millions)	633.5	806.8	62.7	104.2	218.4	441.5	551.1
Current Account Balance (BD Millions)	822.5	1092.9					
As % of GDP	13.8	18.4					
Overall Balance of Payments (BD Millions)	309.1	531.9					
As % of GDP	5.2	8.9					
النقود والمصارف							
Money and Banking							
M2 Growth (%)	5.2	39.3	6.6	11.0	6.7	10.2	7.7
Consolidated Balance Sheet of the Banking System (USD Billions)	187.4	245.8	190.6	212.7	222.4	245.8	252.4
Total Deposits as % of GDP	91.9	123.8	103.4	110.7	113.0	123.8	133.2
Total Domestic Credit as % of GDP	51.0	70.3	54.1	58.0	65.2	70.3	77.7
سوق البحرين للأوراق المالية							
Bahrain Stock Exchange							
Bahrain Stock Exchange Index (Points)	-	-	-	-	-	-	-
Bahrain All Share Index (Points)	2,217.6	2,755.3	2,159.8	2,409.3	2,543.9	2,755.3	2,789.9
Dow Jones Bahrain Index (Points)	198.42	233.62	183.23	204.93	216.04	233.62	236.73
Stock Market Capitalisation (BD Billions)	8.0	10.2	7.7	8.6	9.2	10.2	10.9

السكان

Population

	2002	2003	2004	2005	2006*	2007**
Total Population	**672,124**	**689,418**	**707,160**	**724,645**	**742,561**	**1,046,814**
Bahraini	417,940	427,955	438,209	448,491	459,012	529,446
Male	210,814	215,848	221,019	226,187	231,493	267,437
Female	207,126	212,107	217,190	222,304	227,519	262,009
Non-Bahraini	254,184	261,463	268,951	276,154	283,549	517,368
Male	175,407	180,430	185,598	190,568	195,671	369,586
Female	78,777	81,033	83,353	85,586	87,878	147,782
Annual Population Growth (%)	2.7	2.6	2.6	2.5	2.5	-
Annual Bahraini Population Growth	2.4	2.4	2.4	2.3	2.3	-
Annual Non-Bahraini Population Growth	3.1	2.9	2.9	2.7	2.7	-
Population Under Age 14	**187,105**	**190,108**	**194,828**	**197,800**	**202,565**	**N/A**
Population Above Age 65	**16,457**	**17,375**	**17,798**	**18,321**	**18,756**	**N/A**
Total Fertility Rate Per Bahraini Woman	**2.9**	**2.9**	**2.9**	-	-	-

Source: Central Informatics Organisation.

الاتصالات*

Communication*

	2002	2003**	2004	2005	2006	2006 Q3	2006 Q4	2007 Q1	2007 Q2	2007 Q3
Fixed Exchange Lines	175,644	185,756	191,553	193,520	194,196	191,080	194,196	198,046	201,146	203,112
Mobile Subscribers***	350,000	453,558	649,764	767,103	907,433	872,376	907,433	940,727	899,931	975,211
Internet Subscribers	32,000	52,889	50,382	45,933	60,973	53,304	60,973	67,373	71,947	73,080

القوى العاملة
Employment

	2003	2004	2005	2006	2007	2007 Q1	2007 Q2	2007 Q3	2007 Q4	2008 Q1
Total Employment*	**248,493**	**286,380**	**336,508**	**351,882**	**378,471**	**381,126**	**382,147**	**387,818**	**378,471**	**410,162**
As % of Total Population	36.2	40.4	46.4	47.4	36.3	36.4	37.5	38.0	36.3	39.2
Change (%)	8.5	14.4	17.9	4.6	7.6	8.3	2.9	1.5	-4.6	8.1
Private Sector	**212,864**	**247,814**	**299,080**	**313,039**	**340,217**	**342,451**	**353,628**	**359,185**	**340,217**	**370,826**
As % of Total Employment	85.4	86.5	88.9	89.0	89.7	89.8	90.2	90.3	89.7	90.4
Male	188,583	220,878	269,680	283,533	310,019	309,819	320,657	326,119	310,019	336,913
Female	24,281	26,936	30,600	29,505	30,198	32,632	32,971	33,074	30,198	33,912
Bahraini	**62,278**	**68,228**	**71,800**	**66,814**	**68,834**	**71,703**	**72,352**	**72,820**	**68,834**	**72,884**
Male	46,658	48,916	53,140	47,913	48,660	52,130	52,612	52,926	48,660	52,966
Female	15,621	17,313	18,760	17,701	17,944	19,573	19,740	19,892	17,944	19,968
As % of Private Sector Employment	29.2	26.7	24.0	21.0	19.6	20.8	20.5	20.3	19.6	19.6
Non-Bahraini	**150,586**	**181,586**	**227,180**	**247,425**	**273,383**	**270,748**	**281,176**	**286,373**	**273,383**	**297,981**
Male	142,025	171,962	215,440	235,620	261,129	257,689	267,545	273,191	261,129	284,047
Female	8,660	9,623	11,740	11,805	12,254	13,059	13,231	13,182	12,254	13,914
As % of Private Sector Employment	70.8	73.3	76.0	79.0	80.4	79.1	79.5	79.7	80.4	80.4
Public Sector**	**36,529**	**37,678**	**37,428**	**38,823**	**38,264**	**38,676**	**38,619**	**38,725**	**38,264**	**39,337**
As % of Total Employment	14.6	13.2	11.1	11.0	10.3	10.1	9.9	9.7	10.3	9.6
Male	21,622	21,861	21,495	22,160	21,506	21,874	21,691	21,567	21,506	21,904
Female	14,907	15,715	15,933	16,663	17,348	16,801	16,928	17,158	17,348	17,433
Bahraini	**33,034**	**33,764**	**33,691**	**34,771**	**34,847**	**34,624**	**34,522**	**34,661**	**34,847**	**34,846**
Male	19,248	19,207	18,887	19,431	18,981	19,191	18,969	18,925	18,981	18,966
Female	13,786	14,547	14,804	15,340	15,866	15,433	15,533	15,736	15,866	15,881
As % of Public Sector Employment	90.4	89.6	90.0	89.6	88.6	89.5	89.4	89.5	88.6	88.6
Non-Bahraini	**3,495**	**3,822**	**3,737**	**4,052**	**4,407**	**4,061**	**4,097**	**4,064**	**4,407**	**4,481**
Male	2,374	2,654	2,608	2,729	2,925	2,683	2,702	2,642	2,925	2,939
Female	1,121	1,168	1,129	1,323	1,482	1,378	1,395	1,422	1,482	1,552
As % of Public Sector Employment	9.6	10.2	10.0	10.4	11.2	10.5	10.6	10.5	11.2	11.4
Average Monthly Wages (BD)***										
Private Sector	**218**	**214**	**207**	**210**	**232**	**224**	**228**	**231**	**232**	**248**
Change (%)	-0.9	-2.3	-3.3	1.4	10.5	6.7	1.8	1.3	0.4	6.0
Male	217	211	201	203	90	216	221	224	90	90
Female	238	246	254	276	309	295	304	306	309	339
Bahraini	**356**	**364**	**372**	**414**	**513**	**448**	**471**	**488**	**513**	**520**
Male	387	400	405	464	573	494	522	545	573	573
Female	258	264	278	307	360	324	337	341	360	360
Non-Bahraini	**160**	**160**	**164**	**166**	**163**	**164**	**166**	**166**	**163**	**178**
Male	161	157	161	162	155	160	161	162	159	174
Female	203	215	216	230	250	251	254	253	250	280
Public Sector	**564**	**597**	**664**	**700**	**774**	**866**	**706**	**706**	**774**	**772**
Change (%)	-5.9	5.9	11.2	5.4	10.6	-0.7	1.5	-0.1	9.8	-0.3
Male	591	607	696	742	818	727	741	738	818	807
Female	524	540	621	645	719	653	661	664	719	728
Bahraini	**656**	**674**	**666**	**679**	**757**	**686**	**695**	**702**	**757**	**771**
Male	575	597	682	706	785	711	721	725	785	800
Female	526	543	622	643	723	653	663	669	723	736
Non-Bahraini	**647**	**622**	**788**	****884	*****912	**776**	**802**	**792**	*****912	**780**
Male	720	678	796	963	1030	842	886	803	1030	856
Female	493	495	601	660	680	644	640	601	680	644



الجهاز المركزي للمعلومات

CENTRAL INFORMATICS ORGANISATION

Statistical Abstract 2006

Population

POPULATION BY AGE GROUPS, NATIONALITY AND SEX - 2001

AGE GROUPS	NATIONALITY/SEX								
	TOTAL			NON-BAHRAINI			BAHRAINI		
	BOTH SEXES	FEMALE	MALE	BOTH SEXES	FEMALE	MALE	BOTH SEXES	FEMALE	MALE
0-4	60385	29431	30954	12064	5815	6249	48321	23616	24705
9-5	62150	30682	31468	11425	5623	5802	50725	25059	25666
14-10	58834	28520	30314	9674	4641	5033	49160	23879	25281
15-19	50995	24663	26332	6755	3152	3603	44240	21511	22729
20-24	58675	26512	32163	20317	7835	12482	38358	18677	19681
25-29	69375	26546	42829	39115	11589	27526	30260	14957	15303
30-34	72289	27524	44765	43712	12889	30823	28577	14635	13942
35-39	65415	25494	39921	36078	10196	25882	29337	15298	14039
40-44	55258	19823	35435	30506	6887	23619	24752	12936	11816
45-49	37777	12766	25011	19395	3873	15522	18382	8893	9489
50-54	21331	7237	14094	9290	1769	7521	12041	5468	6573
55-59	12256	5119	7137	3700	761	2939	8556	4358	4198
60-64	9501	4564	4937	1507	392	1115	7994	4172	3822
65-69	6401	3248	3153	669	221	448	5732	3027	2705
70-74	4879	2383	2496	400	124	276	4479	2259	2220
75-79	2664	1287	1377	156	73	83	2508	1214	1294
80-84	1476	681	795	99	41	58	1377	640	737
85-89	598	296	302	49	19	30	549	277	272
90 AND OVER	345	179	166	26	11	15	319	168	151
TOTAL	650604	276955	373649	244937	75911	169026	405667	201044	204623

Percentage Distribution										التوزيع النسبي
0-4	9.3	10.6	8.3	4.9	7.7	3.7	11.9	11.7	12.1	4 - 0
5-9	9.6	11.1	8.4	4.7	7.4	3.4	12.5	12.5	12.5	9 - 5
10-14	9.0	10.3	8.1	3.9	6.1	3.0	12.1	11.9	12.4	14 - 10
15-19	7.8	8.9	7.0	2.8	4.2	2.1	10.9	10.7	11.1	19 - 15
20-24	9.0	9.6	8.6	8.3	10.3	7.4	9.5	9.3	9.6	24 - 20
25-29	10.7	9.6	11.5	16.0	15.3	16.3	7.5	7.4	7.5	29 - 25
30-34	11.1	9.9	12.0	17.8	17.0	18.2	7.0	7.3	6.8	34 - 30
35-39	10.1	9.2	10.7	14.7	13.4	15.3	7.2	7.6	6.9	39 - 35
40-44	8.5	7.2	9.5	12.5	9.1	14.0	6.1	6.4	5.8	44 - 40
45-49	5.8	4.6	6.7	7.9	5.1	9.2	4.5	4.4	4.6	49 - 45
50-54	3.3	2.6	3.8	3.8	2.3	4.4	3.0	2.7	3.2	54 - 50
55-59	1.9	1.8	1.9	1.5	1.0	1.7	2.1	2.2	2.1	59 - 55
60-64	1.5	1.6	1.3	0.6	0.5	0.7	2.0	2.1	1.9	64 - 60
65-69	1.0	1.2	0.8	0.3	0.3	0.3	1.4	1.5	1.3	69 - 65
70-74	0.7	0.9	0.7	0.2	0.2	0.2	1.1	1.1	1.1	74 - 70
75+	0.8	0.9	0.7	0.1	0.2	0.1	1.2	1.1	1.2	+ 75
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	الجملة

السكان حسب الجنسية والنـــوع في سنوات التعـــدادات
(2001 ، 1991 ، 1981 ، 1971 ، 1965 ، 1959 ، 1950 ، 1941)

Population By Nationality & Sex in Census Years
(1941, 1950, 1959, 1965, 1971, 1981, 1991 , 2001)

Nationality/ Census Year	نسبة الذكور Males Percentage	نسبة النوع* Sex Ratio*	Population السكان الجملة Total	إنـاث Females	ذكور Males	الجنسية/ سنوات التعداد
Bahraini						بحرينـــي
1941	...	...	74,040	...	...	1941
1950	...	...	91,179	...	...	1950
1959	50.50%	101.9	118,734	58,821	59,913	1959
1965	50.30%	101.3	143,814	71,446	72,368	1965
1971	50.40%	101.5	178,193	88,421	89,772	1971
1981	50.30%	101.2	238,420	118,496	119,924	1981
1991	50.60%	102.3	323,305	159,852	163,453	1991
2001	50.40%	101.8	405,667	201,044	204,623	2001
Non-Bahraini						غير بحرينـي
1941	...	...	15,930	...	...	1941
1950	...	...	18,471	...	...	1950
1959	72.60%	264.6	24,401	6,692	17,709	1959
1965	70.40%	237.5	38,389	11,373	27,016	1965
1971	70.10%	234.0	37,885	11,343	26,542	1971
1981	75.50%	308.5	112,378	27,509	84,869	1981
1991	70.90%	243.1	184,732	53,839	130,893	1991
2001	69%	222.7	244,937	75,911	169,026	2001
Total						الجملـة
1941	53.60%	115.7	89,970	41,703	48,267	1941
1950	53.40%	114.8	109,650	51,049	58,601	1950
1959	54.20%	118.5	143,135	65,513	77,622	1959
1965	54.50%	120.0	182,203	82,819	99,384	1965
1971	53.80%	116.6	216,078	99,764	116,314	1971
1981	58.40%	140.3	350,798	146,005	204,793	1981
1991	57.90%	137.7	508,037	213,691	294,346	1991
2001	57.40%	134.9	650,604	276,955	373,649	2001

* Males per 100 Females
(...) Not available

* عدد الذكور لكل 100 من الإناث
(...) غير متوفر

Total Population (15 Years +) by Highest Educational Level, Nationality and Sex - 2001

Highest Educational Level	Nationality/Sex الجنسية/النوع								
	الجملة Total			غير بحريني Non-Bahraini			بحريني Bahraini		
	كلا النوعين Both Sexes	أنثى Female	ذكر Male	كلا النوعين Both Sexes	أنثى Female	ذكر Male	كلا النوعين Both Sexes	أنثى Female	ذكر Male
Illiterate/Read Only	63118	30965	32153	31549	9080	22469	31569	21885	9684
Read & Write	49690	20086	29604	33119	11409	21710	16571	8677	7894
Primary	51964	18019	33945	20304	4910	15394	31660	13109	18551
Preparatory	74732	28432	46300	25256	6365	18891	49476	22067	27409
Above Preparatory	13736	4369	9367	7481	1744	5737	6255	2625	3630
Secondary	123932	54142	69790	38523	11965	26558	85409	42177	43232
Above Secondary/Diploma	20691	9843	10848	8942	3644	5298	11749	6199	5550
B.Sc. or B.A.	31760	14456	17304	15091	5836	9255	16669	8620	8049
High Diploma	9360	3883	5477	4106	1520	2586	5254	2363	2891
Master Degree	5008	1521	3487	2851	946	1905	2157	575	1582
Doctorate Degree	1219	321	898	539	131	408	680	190	490
Unknown	24025	2285	21740	24013	2282	21731	12	3	9
TOTAL	**469235**	**188322**	**280913**	**211774**	**59832**	**151942**	**257461**	**128490**	**128971**

Population (15 Years+) by Labour Force Participation, Nationality and Sex - 2001

Labour Force Participation	Nationality/Sex الجنسية/النوع								
	الجملة Total			غير بحريني Non-Bahraini			بحريني Bahraini		
	كلا النوعين Both Sexes	أنثى Female	ذكر Male	كلا النوعين Both Sexes	أنثى Female	ذكر Male	كلا النوعين Both Sexes	أنثى Female	ذكر Male
Working	291376	59853	231523	180391	33787	146604	110985	26066	84919
Unemployed and Worked Before	5596	1466	4130	164	48	116	5432	1418	4014
Unemployed and Not Worked Before	11369	5546	5823	665	262	403	10704	5284	5420
Student	54670	28673	25997	6889	3132	3757	47781	25541	22240
Home Maker	86716	86716	-	22034	22034	-	64682	64682	-
Income Recipient	689	247	442	118	38	80	571	209	362
Pensioners	9392	665	8727	481	32	449	8911	633	8278
Unable to Work	1411	425	986	83	22	61	1328	403	925
Not Interested to Work	4479	3321	1158	693	394	299	3786	2927	859
65 Years.+ and Not Working	3537	1410	2127	256	83	173	3281	1327	1954
TOTAL	469235	188322	280913	211774	59832	151942	257461	128490	128971

Changes in Labour Force Size by Nationality and Sex (1971-2001)

Nationality and Sex	2001	1991	1981	1971
Bahraini				
Male	94353	73118	51949	35884
Female	32768	17544	9250	1843
Both Sexes	127121	90662	61199	37727
Non-Bahraini				
Male	147123	113739	74230	20884
Female	34097	22047	6855	1400
Both Sexes	181220	135786	81085	22284
Total Labour Force				
Male	241476	186857	126179	56768
Female	66865	39591	16105	3243
Both Sexes	308341	226448	142284	60011

WORKING POPULATION (15 YEARS+) BY MAJOR ECONOMIC ACTIVITY AND AGE GROUPS - 2001

Major Economic Activity	Total	AGE GROUPS										
		65 Yrs And Over	60-64	55-59	50-54	45-49	40-44	35-39	30-34	25-29	20-24	15-19
Agriculture And Animal Husbandry	2269	66	38	66	101	203	326	387	467	408	191	16
Fishing	2214	71	45	55	96	180	272	310	429	476	241	39
Mining And Quarrying	2780	17	63	148	259	404	558	503	338	292	179	19
Manufacturing	49979	275	287	856	2195	4350	6628	7899	9882	10436	6516	655
Electricity Water, Gas	2515	5	22	89	189	275	464	483	403	353	208	24
Construction	26416	163	204	464	1058	2329	3690	4253	5533	5270	3096	356
Trade And Repair	34477	705	501	784	1719	3272	4674	5457	6426	6322	4107	510
Restaurant & Hotel	13093	54	57	137	388	900	1442	2018	2658	3079	2160	200
Transport/Storage /Communication	13769	209	256	518	1052	1733	2187	2224	2293	2077	1106	114
Banks/Insurance/ Finance	6475	22	46	153	379	815	1226	1285	1046	972	508	23
Real Estate And Business	16213	211	241	417	855	1538	2095	2667	3276	2931	1697	285
Gov./Defence/ Social Affairs/ Security	52388	228	415	1437	3328	6071	8744	9558	8527	7367	5535	1178
Educational Establishment	13557	39	123	426	1091	1792	2146	2499	2489	2132	669	151
Hospital/Health Centre/Clinic/ Social Work	7572	31	55	200	428	822	1115	1412	1526	1325	625	33
Community Social & Personal Services	10544	193	144	240	487	987	1471	1788	1939	1941	1204	150
Households With Employed Persons	29583	48	96	212	712	1850	3715	5399	7684	5963	3846	58
Regional And International Organisation	2107	1	15	59	110	198	312	427	386	347	244	8
Not Applicable **	5427	37	56	85	250	481	834	1010	1253	967	405	49
Total	291378	2375	2664	6346	14697	28200	41899	49579	56555	52658	32537	3868

ECONOMICALLY ACTIVE POPULATION (15 YEARS+) BY OCCUPATION SUB-GROUPS (*)NATIONALITY AND SEX – 2001

Occupation Sub-Groups(*)	NATIONALITY/SEX								
	TOTAL			غير بحريني NON-BAHRAINI			BAHRAINI		
	Both Sexes	Female	Male	Both Sexes	Female	Male	Both Sexes	Female	Male
Legislators	59	4	55	-	-	-	59	4	55
Senior Officials	874	352	522	16	-	16	858	352	506
Private Sector Managers	12645	1292	11353	5593	402	5191	7052	890	6162
Working Proprietors	7386	944	6442	878	55	823	6508	889	5619
Professionals In Pure Sciences	2028	370	1658	1133	96	1037	895	274	621
Professionals In Applied Sciences	6844	341	6503	4233	64	4169	2611	277	2334
Professionals In Medical & Drug Sciences	1980	948	1032	717	245	472	1263	703	560
Professionals In Human Social, Educational Sciences, Religious & Law	5988	2708	3280	2007	568	1439	3981	2140	1841
Professionals In Culture, Communications And Sports	3432	962	2470	2105	562	1543	1327	400	927
Professionals In Political, Economic Financial & Insurance	5389	1152	4237	2688	223	2465	2701	929	1772
Administration And Manpower Specialists	608	153	455	115	21	94	493	132	361
Pure Sciences Technicians	1364	490	874	264	40	224	1100	450	650
Applied Sciences Technicians	6563	176	6387	2951	30	2921	3612	146	3466
Medical & Drug Sciences Technicians	3962	2866	1096	1362	1090	272	2600	1776	824
Social & Educational Sciences Technicians	6599	4666	1933	1153	754	399	5446	3912	1534
Cultural, Information And Circus Technicians	422	82	340	282	58	224	140	24	116
Economics, Financial Accounting & Secretarial Sciences	1996	910	1086	642	296	346	1354	614	740
Administrative Clerical Workers	27365	6915	20450	7540	1049	6491	19825	5866	13959
Clerical Occupations In Finance, Accounting & Tourism	4199	1754	2445	471	131	340	3728	1623	2105
Commercial Mediation Occupations	3142	396	2746	1270	129	1141	1872	267	1605
Consumer Goods & Luxury & Cultural Articles Selling	5753	1199	4554	3786	304	3482	1967	895	1072

ECONOMICALLY ACTIVE POPULATION (15 YEARS+) BY OCCUPATION SUB-GROUPS (*)NATIONALITY AND SEX – 2001 (Cont.)

Occupation Sub-Groups(*)	NATIONALITY/SEX								
	TOTAL			غير بحريني NON-BAHRAINI			BAHRAINI		
	Both Sexes	Female	Male	Both Sexes	Female	Male	Both Sexes	Female	Male
Scientific Construction, Industrial And Agricultural	1120	86	1034	608	23	585	512	63	449
Personal & Housing Services Workers	48511	25222	23289	44108	24287	19821	4403	935	3468
Religious & Protective Workers	22269	498	21771	9206	49	9157	13063	449	12614
Sea Services, Loading Unloading, Packing & Packaging Workers	5317	194	5123	3762	9	3753	1555	185	1370
Agricultural, Animal & Birds Husbandry Workers	6780	17	6763	5902	10	5892	878	7	871
Aquatic Animals Breeding & Hunting Occupations	144	-	144	96	-	96	48	-	48
Work Supervisors	2823	170	2653	870	27	843	1953	143	1810
Industrial Operations Occupations	17683	5902	11781	14251	2968	11283	3432	2934	498
Miners, Quarrymen & Chemical Operations Occupations	1119	8	1111	625	2	623	494	6	488
Food Industry Occupations	2593	56	2537	2395	30	2365	198	26	172
Mechanical Occupations	28275	77	28198	15775	17	15758	12500	60	12440
Electrical & Electronics Occupations	4821	6	4815	3219	1	3218	1602	5	1597
Carpenters & Decorators	5912	7	5905	4938	5	4933	974	2	972
Construction Occupations	35769	-	35769	31094	-	31094	4675	-	4675
Equipments & Instruments Assembly Occupations	466	3	463	316	1	315	150	2	148
Unknown	4774	394	4380	4184	289	3895	590	105	485
Unemployed & Never Worked Before	11369	5546	5823	665	262	403	10704	5284	5420
Total	308343	66866	241477	181220	34097	147123	127123	32769	94354

APPENDIX 5

SUMMARY OF TECHNOLOGY ACCEPTANCE MODEL STUDIES

TAM Literature

Source: Shengnan (2003), Page 28

No.	Author(s)	Information Systems Applications	Research Context	Subjects	Research Methods	Perceived Usefulness (PU)	Findings
1	Davis *et al* 1989	word processing program Write One	University of Michigan, MBA program	107 full time MBA students	Experi-ment 14 weeks longi-tudinal study	Improve performance Increase productivity Enhance effectiveness Find Write One useful	TRA and TAM comparison. PU scale 0.95 and 0.92 reliability for time 1 time 2 PU-BI 0.48 and 0.61 for time1 time 2 PU-A, 0.61 and 0.50 respectively EOU indirect effect to BI through PU in time 2 SN no effect on intentions
2	Davis 1989	**Study 1**: PROFS-email XEDIT file editor (IBM mainframes accessible through 327X terminals) **Study 2**: IBM PC-based graphic system—Chart-Master and Pen draw	**Study 1**: IBM Canada's Toronto Development Laboratory **Study 2**: MBA at Boston University	**Study 1**: 120 knowledge workers **Study 2**: 40 evening MBA students	Experi-ment	**Study 1**: 1 Quality of Work; 2 Control over work; 3 Work more quickly-; 4 Critical to my job; 5 Increase Productivity; 6 Job performance; 7Accomplish more work; 8 Effectiveness; 9 Makes job easier; 10 Useful **Study 2**: 3,6,5,8,9,10	**Study 1**: PU correlated .56 to PROFS mail usage; .68 to XEDIT usage; EOU correlated PU .56 for electronic mail, .69 for XEDIT, .64 for overall. Effects of PU on electronic mail usage b=.55, XEDIT b=.69, pooled b=.57 **Study 2**: PU reliability 0.98; Chart-Master, PU-self predicted usage r=0.71 Pen draw, PU-usage r=.59, EOU-PU r=.38 Pooled: PU-Usage r=0.85, EOU-PU r=0.56 ($p<.001$)
3	Mathieson 1991	Spreadsheet or calculator	A western university juniors and seniors students in an management course	TAM program 149, TPB 113	Experi-ment	Same as Davis 1989 study 2	TAM: PU= EOU b=0.667; PU-A b=.0.694; PU-BI b=0.481 TAM is successful in explaining intention, having a slightly empirical advantage, easier to apply, only supply general information on user's opinions about a system
4	Moore and Benbasat	PWS- personal work station	First pilot: business faculties of two	First pilot:20 users and	Experi-ment,	Relative advantage:(Perceived	Instrument development procedures, to measure the perception of adopting an IT

	1993		university Second pilot: head office of a utility company Field Test: 7 companies from a variety of industries	nonusers Second pilot: 75 individuals, 66 usable Field test: 800 questionnaires, 540 usable	field survey	characteristics of innovation--PCI)	innovation. To be a tool for the study of the initial adoption and eventual diffusion of IT innovation within organisation.
5	Adams *et al* 1992	**Study 1**: voice and email **Study 2**: WordPerfect, Lotus 1-2-3, Harvard Graphics	**Study 1**: 10 different organisations **Study 2**: undergraduate and MBA students	**Study 1**: 118 respondents **Study 2**: Of 73 returned, 64 WordPerfect, 67 Lotus 1-2-3, 54 Harvard Graphics after three quarter usage.	Survey Experiment (study 2)	Same as Davis 1989 study 2	Davis instruments validation and replication **Study 1**: (homogeneous technology, heterogeneous user group) Email: PU-usage r=.347, EOU-PU r=.0.600; Vmail: PU-usage r=.445, EOU-PU r=.625; pooled, PU-usage r=.0.413, EOU-PU r= 0.688 LISREL structural equation analysis, Email PU-usage r=.36, Vmail r=.31. **Study 2**: (homogeneous user groups, heterogeneous technologies) Structural equation analysis: WordPerfect: PU-usage not significant, r=-0.03, Lotus: PU-usage r=0.85 significant, Harvard Graphics PU-usage r=0.06 not significant, EOU importance to use. Captive usage (no alternative to complete the job) explained WordPerfect low significant PU-usage; EOU is an important determination of the intention only significant early in the use (Harvard Graphics, users have 13 months average experiences, twice lower than use WordPerfect 28 months and Lotus 33 months)
6	Hendrick-son *et al* 1993	Spreadsheet and database	Undergraduate students in a major Midwestern university	Spreadsheet, 51, database 72	Experiment	Same as David's 1989 study 2	Test-retest the reliability of PU and EOU. Initial admin, T1, 3days second admin. T2. Spreadsheet reliability .89 TI, .95 T2, Database .94, and .96.Correlation T1-T2, spreadsheet, .85 PU; database .81 PU

7	Segars and Grover 1993	Same as Adams *et al* 1992	Using Adams' *et al* data			Spilt Davis 1989 PU into PU and effectiveness (effectiveness, job performance)	LISREL Confirmatory factor analysis: Adams *et al* 1992 do not appear well-modelled by the two factor structure; Effectiveness seems the third underlying construct; eight indicators, three factor model seems well-suited to the underlying pattern of correlations.
8	Subramanian 1994	Voice mail and customer dial up system	An organisation	Vmail: 75 of 102; dial up: 104 of 200	Survey	Increase productivity Enhance effectiveness Makes it easier to do job	PU and EOU measurement method through structural equation modelling, build better structural model, PU is a determinant of predicted future usage. Vmail: PU-predicted usage r=.562, Dial up, .437 significantly
9	Szajan 1994	Database management systems (choose packages to build bibliographic database)	MBA students in MIS course	Sample 231based on 47 subjects, 6 selection of DBMSs,	Experi-ment	Same as Davis 1989	Discriminant analysis (Chi Square), predictive validity. PU/EOU instrument can predict the choice behaviour of subjects in a software evaluation project. It is a logical candidate for use in the evaluation and choice of software package.
10	Igbria *et al* 1995	microcomputer	Part-time MBA students at an eastern university	280, 236returned, 214 usable	Survey	Improve performance Increase productivity Enhance effectiveness Find Microcomputer useful	Test of measurement model (sample 1): PU reliability .82, user training .09, EUC support .35 management support .23 system quality .12 EOU .50 have direct effects on PU, explain 48% variance. PU-perceived usage .33, variety of use .16. Assessing the revised measurement model (sample 2): PU reliability .82; User training and system quality strong direct and indirect effects on PU. Computer experiences, EUC support effects on PU. PU positive effect on perceived usage and variety of use.
11	Taylor and Todd, 1995a	Various systems available at computing resource centre-CRC	Business school students	786 users, 3,780 visits, 12-weeks period	Survey	The CRC will be of no benefit to me; Using the CRC will improve my grades; The advantages of the CRC will outweigh the	PU-A path coefficients .79, to BI 1.56, total effects to behaviour .54, to BI 1.41. TAM, TPB and decomposed TPB comparison.

						disadvantage; Overall, using the CRC will be advantageous.	
12	Straub *et al* 1997	Voice mail	A large financial institution in America (final data)	870 randomly users, 458 responded	Field interview Survey	Voice mail is very important in performing my job; Because of information I now get through voice-mail, my decision-making is far more effective.	LISREL, nomological network analysis, subjective (self report or predict) and objective (computer-recorded)measures of system usage Nomological net model: PU-self reported system usage r=0.623, PU –Computer-recorded system usage r=0.173 Rely on subjective measures of system usage may be artifactual.
13	Taylor and Todd, 1995b	CRC	Business school students	430 experienced and 35 inexper-ienced users	6 Survey	Same as Taylor and Todd 1995 a	PU was a stronger predictor of intention (BI) for inexperienced users, it did not differ between the two groups in its impact on A
14	Montazemi *et al* 1996	30 software package (29microcomputer application package, 1mainframe)	A large Canadian integrated steel company	24 information centre product specialists, (ICPS) 22 end users	Survey	Same as Davis 1989 study 2	The selection of packages by ICPS can compromise end users' usage, but whether they are able to correctly evaluate PU and EOU than end users are questioned. ICPS and end users have different assessment of PU. None of the covariates of gender, educational background, level of computer literacy, years of computer experience, the level of computer anxiety had a significant effect on PU and EOU of the software package.
15	Igbaria *et al* 1996	Micro computer	Companies in North America	766 of 62 companies, 519 from 52 companies returned, focus on managerial usage	Survey	1 Using a microcomputer improves my productivity on the job; 2 Using a microcomputer helps me make better decisions by giving	Skills .13 organisational support .16 perceived complexity -.38 have significant effects on PU.PU has the strongest direct effect on usage (b=.26) PU is a principal motivator, perceived complexity is a key intervening variable. Skills promote usage

						me access to higher quality information; 3 Using a computer allows me to be more innovative by providing the opportunities for more creative analysis and output; 4 Using a micro-computer gives me the opportunity to enhance my managerial image	
16	Chau 1996	Word and Excel, Word Perfect and Lotus as alternatives	An organisation	285 of 330 returned, 192 use Word, 176 use Excel	Survey	Perceived near-term usefulness, same as Davis 1989, Perceived long-term usefulness 1Knowledge of ..can increase my flexibility of changing jobs;2 Knowledge of .. can increase the opportunity for more meaningful work; 3Knowledge of .. can increase the opportunity for preferred future job assignments; 4 Knowledge of ..can increase the opportunity to gain job security.	Accomplish tasks more quickly, enhance effectiveness AND increase opportunity for preferred future job assignments omitted in the final data. EOU influences the user's intention to use indirectly via perception of near-term usefulness. Perceived near-term usefulness was found to be the most significant factor affecting intention to use. Also, has a significant and positive influence on perceived long-term usefulness. A user fins a technology useful in current work is predisposed to believe it will help in the future career. Perceived long-term usefulness has direct and statistically significant influence on BI. No significant, direct relationship between EOU-perceived long-term usefulness.

17	Szajna 1996	Email	University	61 graduate business students	Experi-ment, 15 weeks longi-tudinal study	Same as Davis 1989	Pre-implementation: PU has a significant direct effect (b=.72) on intentions, EOU does not, and no effect on PU. Post-implementation: PU has a direct and significant effect on intentions (b=.31), EOU to PU b=.29, no direct effect on intention. PU has a direct and significant relationship with self-reported usage .23. When an individual becomes more experienced with the IT, usefulness directly determines not only intentions to use but also the usage behaviour.
18	Venkatesh and Davis 1996	Experiment 1: IBM PC-based graphics system, Chart Master, Pen draw Experiment 2:Word Perfect, Lotus Experiment 3: PINE for Email, Gopher for information access (UNIX-based)	E1: Boston University E2: Temple University, Philadelphia E3: University of Minnesota	E1: 40 MBA students E2: 36 undergraduat e students E3: 32 part-time MBA students	Experi-ment	Study EOU and its antecedents	E1: Training effects on BI fully mediated by TAM. Direct-interaction with system has an effect on EOU, and form system-specific EOU perceptions. After hands-on experiences, system characteristics became significant in explaining EOU perception. The possibility of computer self-efficacy serves as an anchor for EOU perceptions. E2: Before direct experience, computer self-efficacy b=.57 was significant in determining EOU. After direct experience, both computer self-efficacy b=.51 and objective usability b=.25 were significant. Moderation test, computer self-efficacy determines EOU b=.48, but the effect of objective usability is moderated by direct experience. E3: Similar results as E2. Two systems are found to be harder than users had expected.
19	Agarwal and Prasad 1997	WWW services available on the Internet-Web	University	73 Part-time MBA students-professionals	Experi-ment	Innovation characteristics, current and future use intentions (Moore and Benbasat 1991 25 instruments)	Current usage: Visibility b=.29, compatibility b=.31 and Trialability b=.19 to acceptance, voluntariness b=-.27. Compatibility b=.31, the most important predictor of current usage. Lack of significance of relative advantage.

							Future intention: relative advantage (b=.49) and result demonstrability (b=.34) are significant. The two work in tandem. Current usage (initial use) is not instrumental in predicting future use. EOU was not significant, since Web is inherently easy to use.
20	Jackson *et al* 1997	A wide range of IS (financial system) development projects	6 large accounting firms, involved in IS projects with regional system development firms	585, 139returned, 111 usable	Survey	Situational, intrinsic involvement. PU items same as Davis *et al* 1989	EOU, situational involvement, prior usage and argument for change no correlation to PU. Only intrinsic involvement r=.628 significantly related to PU. PU no effects to A and BI. EOU to A and BI are significant. Situational involvement to BI and A, intrinsic involvement to A, and prior usage to BI, these relationship are significant.
21	Gefen and Straub 1997	Email	US. Swiss and Japan three airline companies	392 usable	Survey	Gender, SPIR (social presence and information richness of the medium) PU as Davis 1989	Gender on SPIR b=-.1429, on PU b=-.1088, on EOU b=.1306 significant at .05 level, not significant on use Gender has an impact on ht IT diffusion process. SPIR and culture as antecedents to PU in the case of email. SPIR to PU .2863, SPIR and covariate of culture on PU is respectable R square is .59.
22	Agarwal and Prasad 1998	WWW information services on the Internet	University	175 MBA students-business professionals	Survey	PIIT (personal innovativeness in the domain of IT) PU similar as Davis 1989, without useful item.	PIIT to BI .47 significant. PIIT moderates effects of compatibility perceptions, not PU and EOU. PIIT could be used as a control variable in individual level studies
23	Doll *et al* 1998	Spreadsheets, Word processing, database, graphics	Two large universities	Of 902, 244 spreadsheet, 156 database, 292 word processing, 210 graphics. Of 581, 105	Lab experi-ment (Initial exposure situation)	Confirmatory and Multi-group invariance analysis. PU and EOU same as Davis 1989	PU-type of applications (rejected): the word processing subgroup had poor data fit. PU is invariant across other three applications. PU –experience (rejected): no experience subgroup had poor model data fit. PU is invariance across novice and experienced users.

				no experiences, 244 novices, 232 experienced. 355 females, 371 males			PU –gender accepted: PU instrument is invariant across gender. EOU-types of applications invariance accepted. EOU –experience invariance accepted. EOU-gender (rejected): Both male and female subgroups had good model data fit. EOU scores are not comparable, the scale differences are probably inconsequential for most practical decision making purpose
24	Partha-sarathy and Bhatta-cherjee 1998	Online services	Online service firm	This sample, 214 continuing adopters and 229 discontinuers	Field Survey	Innovation diffusion theory, post-adoption behaviour: continuous usage, discontinuance usage (replacement and disenchantment), relative advantage (PU), EOU, compatibility as perceived services attributes	PU and compatibility measured at the time of initial adoption can be significant predictors of subsequent discontinuance behaviour. EOU did not have a continuing impact on subsequent discontinuous decisions. Network externality (use of complementary products) during the initial adoption process is a significant predictor of future discontinuance. Early adopters are more likely to be replacement discontinuers, later adopters are more likely to be disenchantment discontinuers.
25	Agarwal and Prasad 1999	PC	A Fortune 100 corporation, IT vendor	Of 468, 230 usable	Survey	Individual differences(Role with regard to technology, tenure in workforce, level of education, prior similar experiences, participation in training) PU: 1accomplish tasks quickly, 2 improve performance, 3 greater control over	A+PU-BI 26% variance. PU+EOU-A 63% variance. EOU-PU, b=.74;. PU and EOU had an equivalent total effect on BI (.39 and .40) EOU +Participation in Training have a significant and positive effect on PU, 57% variances. Other individual differences have indirectly effects through EOU. Role with technology, prior experiences, level of education were all significant determinants for EOU, collectively 18% variance. Beliefs mediated the external variables' effects on attitude toward and behaviour intentions to use.

						work, 4improve the quality of the work, 5 improve productivity, 6 enhance effectiveness, 7 easier to do job 8 useful	
26	Lucas and Spitler 1999	Broker workstations (Sun workstation, windowed interface with Unix operating system, networked to servers and to corporate mainframe computer, includes three main applications: market data, office software, and mainframe access)	An investment bank	Final sample 49 brokers, 58 sales assistants	Survey	Perceived system quality, Norm-Use/intended use, performance, PU: Workstation improves performance, productivity, effectiveness, is useful Two control variables: workload and Job	Perceived quality is an important predictor of PU in the full sample and for sales assistance, not for brokers. EOU is predictor of PU. In the field setting of broker workstations, the individual perception variables PU and EOU in TAM do not approach significance in predicting use. PU and EOU correlated at .62. Combining the two to be a single variable, it is a significant predictor of use for the full sample and sales assistance. TAM does not support it. Norms are predictor of use for all groups, not broker. Low performance (of prior performance of similar system) is associated with higher levels of use and intended use for brokers and full sample. Performance of prior systems is the best predictor of performance of new systems. Job differences or tasks may be an important predictor of use.
27	Venkatesh 1999	Virtual workplace system(Internet-based telecommuting application)	Organisations	**Study 1**: Of 320, 69 attended; **Study 2**: Of 500,146 usable, knowledge workers	Survey	Game-based training vs. traditional lecture-based training, intrinsic motivation (playfulness) PU Davis 1989	Game-based training intervention has higher levels of EOU. EOU leads to enhanced BI to use in comparison with users in the traditional training interventions. Game-based methods will potentially allow users to scale initial hurdles to acceptance and usage, also create higher-level of intrinsic motivation, which is more likely to lead to sustained usage behaviour. PU is not statistically different across interventions

28	Karahanna *et al* 1999	Windows 3.1software package	A large financial institution	Final sample, 77 potential adopters, 153 users	Survey	Pre-adoption and post- adoption. Instruments based on Moore and Banbaset 1991. PU: accomplish task more quickly, improve quality of work, enhance effectiveness, make job easier	PU (.42 and .82) is the only belief underlying A to adopting and to continuing to use. Image .32 is significant for users. Visibility, result demonstrability .35, EOU.06, Trialability -.40 are significant for potential adopters. Prior to adoption, behavioural and normative beliefs influence A to adoption. Post-adoption, only PU and Image enhancements influence A.
29	Hu *et al* 1999	Telemedicine technology	Public tertiary hospitals in Hong Kong	Physicians, of 1728, 42returned, 408 usable	1 Survey	PU: enable to complete patient care more quickly; CANNOT improve patient care and management; increase productivity in patient care; CANNOT enhance effectiveness; Make patient care and management easier; Not useful for patient care and management.	PU has a significant and strong influence on physicians' BI to the technology .36, to A.45. PU total effects on BI is .47 EOU has no significant influence on PU and A. Reflect limitations of TAM's applicability with respect to technologies, user populations or both The explanatory power of TAM, particularly the EOU factor, may weaken as the competency of the users increase, like physicians.
30	Agarwal and Karahanna 2000	WWW	A large state university	288 junior students	Experi-ment	PU: using the web enhances effectiveness in college, enhance productivity, improve performance in college, using web useful in my college activities. EOU, self efficacy (SE), playfulness	Without CA direct impact on BI: CPS-CA b=.360, PIIT-CA b=.408, CA-PU.517, CA-EOU .587, SE-PU.057, SE-EOU.230. EOU-PU not significant. PU-BI .475, EOU-BI .307. Totally explained 48% variances With CA direct impact on BI: PU-BI .367, EOU-BI .208, CA-BI .246, totally explained 50.7% variances. Neither PIIT nor CPS are statistically significant predictor of PU and EOU, CA mediated the effects with respect to beliefs about IT.

						(CPS), PIIT, Cognitive Absorption (CA)	
31	Venkatesh 2000	**Study 1**: a new interactive online help desk system **Study 2**: a new multi-media system for property management **Study 3**:PC-based (windows 95) payroll application	**Study 1**: a medium-sized retail electronic store **Study 2**: a large real estate agency **Study 3**: a medium-sized financial services firm	**Study 1**: Of 70, 58 usable **Study 2a**: Of 49, 41 usable, **2b** : of 107, 104 usable **Study 3**: Of 52. 43 usable	Survey (voluntary use, initial training T1, 1 month T2, 3 months T3)	EOU and its antecedents. Anchors (computer self-efficacy, perception of external control, computer anxiety, computer playfulness); adjustments (perceived enjoyment, objective usability). Experience is moderating variable	PU and EOU explained 35% variances in BI. EOU fully mediated the proposed antecedents to BI. EOU has a direct and indirect (via PU) to BI. At T1, the proposed anchors were only determinants of EOU, explain 40% variances. With increasing experience, adjustments play a key role in determining system-specific EOU, 60% variances explained. The general anchors continued to be important factors, e.g., computer self-efficacy and facilitating conditions were stronger determinants than were adjustments resulting from the user-system interaction.
32	Venkatesh and Morris 2000	Data and information retrieval system	5 organisations	Of 445, 324 usable response, 156 female, 186 male	Survey	Gender, experience, five months period. PU: improve performance, increase productivity, enhance effectiveness, useful	After initial exposure: men placed a greater emphasis on U-BI than women, women weighted EOU-BI more strongly, not significant for men. There were no gender difference in the role of EOU to U. SN was a significant factor influencing BI for women, not significant to men Long term: men were more strongly influenced by U to BI, than women. Women continued to weight EOU as a direct determinant of BI more strongly than men. No difference in the EOU-U relationship between men and women. SN did not influence men in the long term. Women were still influenced by SN after one month sustained technology use. SN is not significant to women after 3 months
33	Venkatash and Davis 2000	**Study 1**: a proprietary system (floor and machine scheduling	**Study 1**: a medium-sized manufacturing firm	**Study 1**: Of 48 floor supervisors,	Survey, longit-udinal	PU and its antecedents, two processes: social	**Results of pooled across studies and time periods (n=468)** Consistent with theory, the basic TAM

		and personnel assignment) **Study 2**: System project (move current mainframe operations to a Windows-based environment) **Study 3**: Windows-based customer account management system **Study 4**: Stock management system	**Study 2**: A large financial services firm **Study 3**: A small accounting services firm **Study 4**: A small international investment banking firm	38 usable **Study 2**: Of 50, 39 usable **Study 3**: Of 51, 43 usable **Study 4**: Of 51, 36 usable	field studies	influence processes (SN, voluntariness and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and EOU). Scales of PU, EOU, BI same as Davis 1989 and Davis *et al* 1989.	relationships, BI—use .52, PU-BI .55, EOU—BI.17, EOU-PU.30, were well supported, with full mediation by intention and no moderation by either voluntariness or experience. SN-BI was significantly moderated by both experience and voluntariness. SN significantly affects intention directly only when usage is mandatory and experience in the early stages. SN-PU (internalisation) was significantly moderated by experience. Image –PU (identification) no significant. Job relevance and output quality –PU are interactive. .40 TAM2 explained 60% variance of PU, SN exerts a significant direct effect on BI over and above PU and EOU for mandatory (not voluntary) systems.
34	Venketesh and Brown 2001	PC use in Household	American households	733 completed response at phase 1, 87.9% follow up response in phase 2 (after 6 months)	Mail survey, telephone interview	Attitudinal beliefs(utilitarian outcomes, hedonic outcomes, social outcomes); normative belief SN (social influences); Control beliefs (PBC)	Utilitarian outcome, hedonic outcome and social outcome drive adoption. Rapid technology changes and fear of obsolescence drive non adoption.
35	Plouff *et al* 2001	Exact Smart card-based payment system	Canadian merchants involving in system trial	Of 379, 176 usable response	Survey	TAM and PCI comparison PU similar with Davis 1989, PCI as Moore and Benbasat 1991	TAM: EOU-PU .531 28.2% variances explained, PU-BI.507, EOU-BI .108, 32.7% variance explained. PCI: relative advantage .291, EOU .005, compatibility .167…BI, 45.0% variance explained. Full set of PCI adds significantly to predict BI.
36	Chau and Hu	Telemedicine	Public tertiary	Physicians, of	1 Survey	TAM, TPB and	TAM 40%, TPB 32% and DTPB 42%

	2001	technology	hospitals in Hong Kong	1728, 42returned, 408 usable		decomposed TPB comparison PU: Using telemedicine technology cannot improve my patient care and management, cannot enhance my effectiveness, not useful	variances explained. PU was a significant determinant of A and BI in both TAM and DTPB. EOU not in all models. Compatibility –PU .70 (DTPB) is significant, not EOU. PU exhibited the strongest direct and total effects on BI. EOU was not found to have any effects on PU or A. Compatibility has greater indirect effect on BI than direct effect.
37	Koufaris 2002	B2C e-commerce web-based store	Booksamillion.com customers	Online users, 300 complete first part, and 280 of those filled out the second part	Online survey, question-naire ran for one week	TAM and flow theory. PU: using booksamillion.com can improve my shopping performance, increase shopping productivity, increase shopping effectiveness, useful.	Shopping enjoyment b=.345 and PU .415 have significant effect on intention to return. Product involvement .280, challenges .216 and skills .142 have significant effect on customer concentration. Involvement .218, challenges .338, skills .180 and value-added use .207 have significant effect on customer shopping enjoyment Confirm the dual nature of the online consumer as a traditional shopper and a computer user
38	Hong *et al* 2001-2002	Digital Library: E-library	The open University of Hong Kong	Non-traditional students, 1244 interviewed, 585 retained	Telephon e interview (17min)	Individual differences (computer self-efficacy, knowledge of search domain), systems characteristics (relevance, terminology, screen design) PU: Using the E-library would enable me to accomplish my study more effectively,	EOU=computer self-efficacy .18+knowledge of search domain.11+relevance .14-terminology.37+screen design.29, 69% variances explained PU=EOU.39+relevance.61, 57% variances explained BI=PU.51+EOU.17, 52% variances explained

						improve my performance, make it easier for me to do my assignments and prepare for the examination, useful in my study	
39	Venkatesh *et al* 2002	database and virtual work place	Same as Venkatesh 1999 and Venkatesh and Speier 1999	Same as Venkatesh 1999 and Venkatesh and Speier 1999	Same as Venka-tesh 1999 (add longitudi nal study) and Venka-tesh and Speier 1999	User acceptance enablers (UAE), (training environment, Pre-training mood, control), intrinsic motivation IM, extrinsic motivation (PU), EOU, BI, short-term use, continued use	IM-EOU .45, IM-PU .27, EOU-PU .27. EOU-BI.23, PU-BI .44 have significant effect on BI. IM no direct effect on BI, only through EOU and PU. BI-immediate use (short term) .59, fully mediating the influence of IM, EOU, PU; Short-term use-continued use .59, it is the sole predictor of continued usage. All other variables measured at t1 and t2 were non-significant predictors of continued use.
40	Chau and Hu 2002	Telemedicine technology	Public tertiary hospitals in Hong Kong	Physicians, Of 1728, 408 usable response	Interview and survey	PU same as Chau and Hu 2001. EOU, Compatibility, peer influence, perceived technology control, attitude, BI	Proposed a three-layer hierarchical framework for professionals' acceptance of technology. Individual context at the inner core, the implementation context on the outermost layer, the technological context in the middle Model results: 43% variance explained. PU determines A and BI. EOU influences perceived technology control, not PU and A. Compatibility determines PU, not EOU, has strong indirect effects on BI through PU. Peer influences no effects on A or BI. A has direct effects on BI, weaker than PU, greater than perceived technology control to BI.
41	Gefen *et al*	Online shopping, E-	Business school in	Of 400	Field	Same as Davis 1989.	Consumer's intention to transact with an e-

	2003	commerce (B2C, low-touch low risk items)	the mid-Atlantic region	students, 213 usable (experienced online shopper)	survey	Trust (Calculative-based, institution-based, i.e., structural assurances, situational normality, knowledge based familiarity)	vendor depends on trust, PU and EOU. PU is stronger direct predictor than trust. The effect of familiarity on trust was fully mediated by EOU. Institution-based beliefs of structural assurances and situational normality have the most effect on trust.
42	Summan and Siegal 2003	Information adoption	A multinational public accounting firm (North American operations)	46 interviewed, Of 178 survey, 63 usable	Interview , survey	PU transferred as information usefulness (information is valuable or worthless, informative or uninformative, helpful or harmful), Argument quality, source credibility as antecedents for usefulness, recipient expertise and involvement as moderators	Integration ELM with TAM. Argument quality and source credibility are significantly associated with usefulness. Usefulness associated with information adoption highly. Usefulness mediated effects of argument quality and source credibility on adoption. Recipients expertise and involvement moderated effects of argument quality on usefulness significantly, but only marginally for source credibility External validity of knowledge(usefulness for problems at hand) is more important than internal validity of that knowledge