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The role of information and communication technologies in enhancing customer relationships in the Libyan banking sector

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University of Wollongong

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The Role of Information and Communication Technologies in Enhancing Customer Relationships in the Libyan Banking Sector

A thesis Submitted in fulfilment of the requirements for the award of the degree

DOCTOR OF PHILOSOPHY

from

THE UNIVERSITY OF WOLLONGONG

by

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2013
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Praise is to Allah, Lord of the Worlds and May peace and God's mercy and blessings for all.
Abstract

Significant changes in the business environment globally have forced the banking sector to modify their service strategies. One of the primary goals of banks is now to leverage advances in information and communication technologies (ICT) to build and maintain long-lasting relationships with customers through the adoption of new channels that facilitate electronic banking. The literature has identified that ICTs are an ideal medium for carrying out banking activities with customers due to the cost savings offered and speed of information transmission.

While the global banking sector is one of the most up-to-date industries with regard to the use of the Internet and mobile technologies, developing countries (such as Libya) have not broadly adopted these technologies. For example, ATMs, online banking and mobile banking are either not offered or provided on a restricted basis by many banks. As developing countries now seek to catch up with the global environment, both banks and customers are likely to face challenges. Understanding the reasons for the lack of ICT usage in developing countries is useful for informing future adoption strategies and hence improving relationships between banks and their customers.

This thesis investigated (from the customers’ perspective) the factors that determine whether the Libyan banking sector can effectively utilise self-service technologies to create relationships. Specifically, it investigated the importance of online relationships with customers. These relationships can be understood through several factors including attitude, trust, quality, satisfaction and loyalty. The research sought to understand which factors drive customers to use self-service technologies as compared with traditional channels of banking.

This thesis also investigated the relationship(s) in online banking between the constructs of perceived easy of use, perceived usefulness, service quality, customer satisfaction, customer trust, technology attitude, and customer loyalty. These relationships have not previously been considered in the Libyan banking industry. The Technology Acceptance Model is extended to describe the impact of ICT in creating customer relationships in banking.
Data was collected through both surveys and interviews. All participants were Libyan citizens living in Australia, who had experience as a customer of both a Libyan bank and an Australian bank.

This thesis found that perceived usability, online banking quality, customer satisfaction, customer trust and customer loyalty are all important components of ICT-facilitated banking success. Notably, customer satisfaction mediates the relationship between online banking quality and customer loyalty. Also, the trust that the customer places in the bank needs to be considered, as it is strongly related to loyalty. The findings provide useful insight for banks in developing fitting banking strategies to meet customer needs, and further to maintain and increase the degree of relationships with customers. The interviews also provided a richer understanding of the enablers and inhibitors of e-banking adoption in the Libyan banking sector.

There are numerous factors that need to be overcome for the Libyan banking sector to achieve global competitiveness in the use of self-service ICTs. One of the most significant findings is that Libya must reach out to its citizens about Internet technology and mobile technology, improve its national technological infrastructure, and include the input of all customers in the implementation of ICT applications and services.
Thesis Certification

I, Fouad Omran Salem Elgahwash, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Information Systems and Technology, Faculty of Engineering and Information Sciences, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Fouad Omran Salem Elgahwash

31st July 2013.
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<tr>
<td>CBA</td>
<td>Commonwealth bank of Australia</td>
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<td>CDB</td>
<td>Commerce and development bank</td>
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<td>CL</td>
<td>Customer Loyalty</td>
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<td>CS</td>
<td>Customer Satisfaction</td>
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<td>CT</td>
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<td>gB</td>
<td>Agriculture bank</td>
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<td>Information and Communication Technology</td>
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<td>OBQ</td>
<td>Online banking quality</td>
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<td>PEOU</td>
<td>Perceive Ease of Use</td>
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<td>SQ</td>
<td>Services quality</td>
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<td>TA</td>
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<td>WB</td>
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CHAPTER 1: Introduction

1.1 Overview of the Study

During the past decade, Information and Communication Technology (ICT) has become a requirement for banking worldwide and it now plays a vital role in creating and supporting customer relationships (Al-Mabrouk and Soar 2009). This ICT revolution has the potential to improve the Libyan banking sector and establish a more customer-centric focus (Leek et al. 2003), creating benefits for both banks and their customers. Both directly and indirectly, all aspects of the overall success of the banking sector are driven by the ICT revolution; it has heavily influenced both formal communications and relationship processes (Al-Mabrouk and Soar 2009). The use of ICT within the Libyan banking sector has expanded rapidly in recent years as banks have recognized its ability to provide staff with faster access to detailed information with regard to customer enquiries (Zammuto and Laube 2003).

ICT incorporates communications, models, policies, applications and plans (Liao et al. 2009) along with the tools, people and processes used to capture customer information and services 24 / 7 (Eichorn 2004). Previous studies by Vogel (2005) and Liao (2009) have reported that software, the Internet, mobile phones, voice conversations and procedures related to ICT create greater interactivity with customers. Furthermore, in many developing countries, such as Libya, the banking sector is looked upon as a significant component in the permanent structure of business because it plays a key role in selling products and services (Liao et al. 2009).

The introduction of ICT in the banking sector in developing countries has created increasing competition among banks, forcing them to further develop their use of technology to help them to stay competitive and serve their customers. ICT is seen as an approach for banks to deliver better, faster and more effective service in all banking interactions with their customers, forming the basis of the banking sector’s customer-centric operations. Despite the developments in recent years, banks must continue to develop their use of ICT, and specifically ICT applications, to ensure
competitiveness in the local market as well as internationally (Idowu et al. 2002, Ho and Mallick 2006).

In recent years, the Libyan government has invested large sums of money on ICT annually to improve the business sector and enable the banking sector to create good customer relationships (Twati and Gammack 2006, Al-Mabrouk and Soar 2009). This study will analyse the change of orientation in the Libyan banking sector, moving from non-relationship focused to establish close long-term relationships with customers. Specifically, this thesis will focus on the efforts of Libyan banks to deliver excellent service to customers, leading to positive customer relationships. A customer-centric point-of-view will be used for this analysis.

This chapter provides an overview of the thesis. It begins by explaining the background of the study, a statement of the research issue, Objectives, research questions, Significance, and Overview of the research methodology for the study with structure of this thesis (Six Chapters).

1.2 Background of the Study

ICTs have found their way into all areas of business, financial services, education and governments. Internet banking, for example, allows customers to conduct their banking interactions when and where it is most suitable to them. As result of comprehensive ICT, access to banking-related services and facilities is available to customers. This has also enabled a reduction in errors and the potential to remove or automate daily routines, thereby saving time (Banerjee 2009, Alsajjan and Dennis 2010).

The banking sector in Libya has utilized Internet connections with customers since 1998 (Twati 2008). The Internet has emerged as a new business tool for greater interaction with customers; it provides many methods for communication between customers and banks. The transformation delivered by the Internet across the developed world has been evolutionary, and these gradual but significant changes have also been seen in the banking sector (Davison et al. 2000). As the banking sector has become more competitive, many banks have realized the advantages offered by the Internet for establishing good customer relationships (Banerjee 2009,
Alsajjan and Dennis 2010). The Internet is increasingly being seen as the main channel to deliver banking services. It enables customers to access accounts, transfer funds and buy products online (Alyabis 2000, Al-Sukkar 2005, Mastoori 2009). A study by Elalag (2003) of 4370 customers who visited banking web sites found that 82% of these customers preferred to interact with banks via the Internet, and 22% of customers also believed that they had a greater chance of obtaining the best services for the best prices on the Internet.

Previous studies by Akel (2001) and Mastoori (2009) found that the Internet transformed most businesses by integrating computers and networks, viewing it as a tool for economic purposes because it generates profits. Banks use the Internet to supply services based on the needs of customers. According Al-Sukkar (2005), Internet banking allows customers with the ability to interact with their bank on their own computer, serving as new channel for customers to be in contact with banks that provides an alternative to the traditional branch network. Many customers are adopting this technology because it delivers greater control over their personal assets and access to financial services. It removes the traditional branch limitations by allowing customers to access their accounts 24/7 with reduced waiting time, regardless of a customer’s geographic location. Internet banking delivers banking products and services directly to customers (Wamalwa 2006), consequently delivering convenience, building trust, providing satisfaction and enhancing customer loyalty (Podder 2005, Banerjee 2009, Chi Lee 2009, Mastoori 2009, Alsajjan and Dennis 2010, Chi Lee 2010, Maenpaa 2010, Nasri and Charfeddine 2012). Through the use of Internet banking, banks provide another means for their customers to conduct business.

Internet banking allows customers to access and perform financial transactions on their own bank accounts from any computers with an Internet connection (Al-Sukkar 2005). Internet banking facilities typically include the use of the bank’s web site for viewing an account, balance and transactions records, paying bills, statement delivery and opening an account (Wamalwa 2006, Raman et al. 2008, Safeena et al. 2011). Internet banking has the potential to reduce the costs and inconvenience for customers wanting to switch between banks, while simultaneously enabling banks to offer low-cost, value-added financial services to their customers (Wamalwa 2006, Raman et al. 2008, Safeena et al. 2011).
Extending the basic premise of Internet banking, which uses the bank’s web site, a second increasingly popular channel for customers to interact with their banks is through the use of mobile phones. Mobile phones have dramatically changed the daily lifestyles of individuals throughout the world. In only a few years, mobile technologies have changed from simple voice transmitting and receiving devices to a total computing and communication solution that can accommodate voice, text, pictures, video, SMS and other types of multimedia. These features have transformed mobile phones from expensive functional tools to general-purpose accessories that are used by all people of all classes for a vast array of purposes (Alhinai 2009). Currently, it is common for people to use mobile phones for accessing the Internet, watching movies, conducting shopping and making financial transactions (Emmanuel 2007, Donner and Tellez 2008, Cheah et al. 2011).

Mobile banking (M-Banking) presents an opportunity for banks to retain their existing, technology-focused customer base by offering value-added, innovative services and to attract new customers (Donner and Tellez 2008). M-banking is a term that refers to performing balance checks, account transactions and payments via a mobile. M-banking is the use of data-enabled mobile handheld devices to perform activities such as communicating, obtaining information, and transacting, so that technologies have a direct or indirect monetary value through wireless connections to the internet or to banks' private networks (Alhinai 2009). It is most often presented via SMS, mobile voice or the Internet. It can also be used as a program downloaded to the customer’s phone. Numerous studies have addressed that m-banking has had a positive influence on the relationship processes between banks and customers (Suoranta 2003, Chung and Kwon 2009, Cheah et al. 2011).

There are approximately sixteen banks in the Libyan banking sector (Libyan Central Bank 2005). From an extensive literature review no previous studies of the Libyan banking sector have been conducted focusing on the customer perspective with the methods used in this study. This study will identify and explain the usefulness of Internet banking and m-banking services, particularly in Libyan banks. The research will focus on the (limited) efforts that the Libyan banking sector has made in order to deliver service to customers, which has lead to the creation of valuable customer relationships by using ICT applications. Thus, the
current thesis makes an important contribution to the understanding of mobile banking characteristics for banking customers in Libya.

The population of Libya was estimated to be approximately 5,613,380 in 2012 and the number of Internet users in Libya at 2004 was approximately 160,000 users, it has grown to approximately 323,000 users in 2009 (Internet World Stats 2012). This lack of Internet adoption may be one reason for the slow engagement of e-banking by the banking sector as a whole.

1.3 Statement of the Problem

The motivation for this thesis stems from an increasing need for the evaluation of how the adoption of ICTs into the banking sector affects customer relationships in the developing world. There are banks wishing to integrate ICT applications into their businesses processes to create customer relationships (Cavusoglu 2003), in the developing world, and especially Libya. Some Libyan banks continue to restrict their operations to traditional manual techniques, and ICT has not been adopted across the majority of the banking sector. Due to traditional manual techniques, banks are still dealing with customers in inefficient ways. In many institutions, only basic transactions (such as accounts balances or simple payroll systems) are available to customers. Currently, there is limited networking between many banks and their branches; customers are forced to wait in lines for manual cheque processing - this is the only way to access cash in their bank accounts (Twati 2008). The Libyan banking sector has undergone little change in recent years – it has not embraced ICT in the same way as the banking sector in other countries (Rose 2007). As a result, rapid implementation of effective ICT has now become essential to support service processes, automate many routine activities and provide the ability for Libya’s banking sector to remain relevant and competitive.

ICT has the potential to positive and significant affect banks’ market values (Feinberg and Tokic 2004). It can also act as a promotional tool, used to attract customers to a bank’s website for self-service interactions. Self-service i.e. allowing customers to perform a process without intervention by any person (Vogel 2005) has been identified as having a positive effect on customer satisfaction, trust and loyalty for banking (Hamed et al. 2008).
Studies of ICT-related customer relationships in the banking sector in developing countries have not considered the situation faced by banks in Libya (Twati and Gammack 2006, Al-Mabrouk and Soar 2009). Some Libyan banks have adopted ICT programs through the introduction of websites, but these websites do not actively connect with most customers. It can be concluded from previous research that ICT offers opportunities for the Libyan banking sector to improve their business by enhancing access to customers and creating an improved customer experience. This study will attempt to improve understanding of the role ICT has in enhancing customer relationships in Libyan banks.

The application of ICT across the developed world has positively impacted on businesses by providing strategies for building and enhancing customer relationships and increasing the speed and flexibility of work (Zammuto and Laube 2003). Lesjak and Lynn (2001) suggested that ICT is playing an increasingly critical role in the design of relationship processes and implementation in the banking sector specifically. ICT delivers the tools needed for growing long-term customer relationships and for integrating banking processes into customers’ daily operations (Shaw 2000). One increasingly popular strategy for establishing this integration is m-banking. In addition, banks have found that ICT is an important source for establishing strong strategies that enhance competitiveness (Shaw 2000). It is particularly useful for developing and implementing strategy to address the needs of local customers.

The Libyan banking sector currently has an increasing amount of recent competition from the local and international market. This can be attributed to the reason that traditional banks in Libya were not interested or do not have the customer service experience to allow transactions to completed through electronic applications, that enhance relationships, achieving CT, CS and CL. An understanding of how the use of ICT in banks in developed nations, such as Australia, can be help in developing and maintaining customer expectations and drive a competitive advantage for Libyan banks. This study attempts to draw attention of these issues to banks by providing evidence supporting that ICT adoption can provide positive benefits in building and enhancing customers relationships. It is believed that relationships can enhance the overall banking strategies and provide competitive advantages for Libyan banks in the long term.
1.4 **Objectives of the Study**

This study will attempt to improve Libyan banks’ approach to the use of ICT applications for creating and maintaining customer relationships. As result of their poor integration of ICTs, many Libyan banks have missed successful strategic opportunities to provide value that enhances customers’ relationship with their bank (Kearns 1997, Aterido et al. 2009). This study argues that there will be a significant improvement in the creation of customer relationships if banks harness the potential of ICT. Many Libyan banks do not understand how ICT can create customer relationship. Due to this lack of understanding, banks have failed to develop good ICT strategies. This thesis aims:

(i) To examine whether the use of ICT in the Libyan banking sector could influence the establishment of relationships with new customer.

(ii) To examine whether the use of ICT in the Libyan banking sector could influence the maintenance of relationships with existing customers, and specifically, how does it impact on customer loyalty.

(iii) To examine whether the use self services ICT in the Libyan banking sector could influence experiences of services delivery and relationships with customers.

(iv) To examine whether prior exposure to self services ICT banking in developed nations could influence customers’ expectations of and engagement with ICT in the Libyan banking sector.

1.5 **Research Questions**

To address the research aims in Section 1.4, this research will address the following questions:

1. How does the use of ICT in the Libyan banking sector influence the establishment of relationships with new customers?
2. How does the use of ICT in the Libyan banking sector influence the maintenance of relationships with existing customers, and specifically, how does it impact on customer loyalty?

3. How does the use of self-service ICT in the Libyan banking sector influence experiences of service delivery and relationships with customers?

4. How does prior exposure to self-service ICT banking in developed nations influence customers’ expectations of and engagement with ICT in the Libyan banking sector?

1.6 Significance of the Study

This study considers the state of Internet banking and m-banking in Libya. This research explores the operations of the Libyan banking sector through qualitative and quantitative data. Analysis of this data is used to provide a unique contribution to the literature on customers’ relationships with the Libyan banking sector (Myers 2005, Twati and Gammack 2006).

The major contribution of this study is that it provides significant evidence that ICT plays vital role to create customer relationships in Libyan banks and it is essential to deliver competitive advantage for Libyan banks (Willette 2006). The outcomes will assist Libyan banks in identifying and implementing ICTs that facilitate stronger relationships with customers. The research is significant to the banking sector because it explains the importance of ICT in enhancing customer relationships in the banking sector (Mari and Minna 2004, Laukkanen and Pasanen 2008, Mobile Marketing Association 2009, Ying and Can 2010). This research examines the impact of ICT on customer trust, customer satisfaction, customer loyalty and customer retention (Wong 2005).

The results of this study can facilitate enhanced relationships through the implementation of appropriate and useful ICTs across the Libyan banking sector, and hence assist banks to achieve their business goals. Indeed, Libyan banking still depends on foreign companies (such Western Union) to transfer money for customers because it has experienced systematic failure of IT adoption. Embracing
the opportunities offered by ICT could revolutionize both the banking sector and entire Libyan economy.

Numerous researchers have discussed the relationship between technologies and the satisfaction index (Cutcher 2004, Ab-Hamid 2006, Ledbetter 2007), but there is limited literature on electronic retention and electronic loyalty events. This thesis suggests that trust and satisfaction are closely related to loyalty, and that positive interactions are likely to lead to long-term loyalty (Gupta et al. 2006); this thesis also suggests that an increase in the number of loyal consumers may result in an increase in banks’ customer retention and profit. Hence, this study aims to contribute to knowledge about customer retention and loyalty actions as related to Internet banking and mobile banking. It was also found that banks that implemented creative marketing strategies through offering new products and services increased their market share and customers value (Wamalwa 2006). These contributions are deemed beneficial to marketers, especially when determining important ICT service features and the level of significance of each attribute associated with improved satisfaction and enhanced loyalty as a result of relationships through various channels (Ab-Hamid 2006).

In addition, this research contributes to knowledge about the banking sector and extends theoretical knowledge about banking, customer relationship processes and the acceptance of ICT (Twati and Gammack 2006). Though many factors leading to technological adoption are important and deserve serious considerations, Libyan banks’ unwillingness to accept new ICT channels of customer interaction (Wong 2005) is possibly the most significant-both historically (it is the reason for the current situation) and for future development.

1.7 Overview of Research Methodology

This study engaged with customers of Libyan banks, but who live in Australia and also have experience Australian banks that offer ICT-enabled banking channels. It should be noted that, while all the Australian banks involved offered these channels, it was not compulsory for participants to have engaged with them. The methodology was selected to facilitate exploration of the role of ICT in explaining the relationship between customers and banks in Libya.
This research has adopted a multi-method approach (survey questionnaire and Sami-structured interviews) to understand the relationships between ICT use and banking customers’ perceptions of their banks. The impact of increased ICT offerings on loyalty was explored. A paper-based survey was used to collect quantitative data from Libyans living in Australia who held accounts with a Libyan bank and an Australian bank. The quantitative data was statistically analysed to determine the impact of ICT on satisfaction, loyalty and trust.

Semi-structured interviews with a different group of Libyans living in Australia who held accounts with a Libyan bank and an Australian bank were then conducted. The interviews were used to collect qualitative data to further support the findings of the quantitative research and to gain an understanding of motivations and perceptions. The qualitative data was coded on the themes of satisfaction, loyalty and trust to better understand the statistical findings. Otherwise, see Chapter 3 for a complete description of the research methodology.

1.8 Structure of the Thesis

This thesis is organised into six chapters as described below:

Chapter 1 has presented an overview of the thesis, including explaining the background to the research, listing the research objectives and outlining the methodology used.

Chapter 2 presents an extensive review of the related literature. It reviews related ICTs, explores the importance of customer relationships, considers ICT investment in the banking sector, provides an overview of Libya, and then discusses the Libyan banking sector. This chapter develops the theoretical framework underpinning this study and explains the research propositions.

Chapter 3 provides a description of the research methodology. It describes and justifies the methodology used in this study, including the research design, sampling technique and the design and administration of the survey and interviews as tools for data collected. This chapter provides an explanation of the data analysis methods and statistical techniques used to confirm the reliability and validity of the data collected.
Chapter 4 presents the data analysis of the survey data and the interview data. In this chapter common statistical tests are used to investigate the research objectives.

Chapter 5 presents a detailed discussion of the analysis for whole thesis and provides details for questions answerer.

Chapter 6 summarizes the conclusions from the study, clarifies the contributions and implications of the research, recommendations and considers possible areas for future research.
CHAPTER 2: Literature Review

2.1 Introduction

This chapter will first consider Information and Communication Technologies (ICTs). Particular attention will be given to the Internet, and its use within technology-based self-service in the banking sector. The term electronic banking (e-banking) includes telephone banking, Internet banking, and mobile banking (m-banking) (Hunaiti et al. 2009). Section 2.2 will focus specifically on the two most recent types of e-banking: Internet banking and m-banking. Section 2.3 will explain online customer relationships and explore the critical aspects of establishing and maintaining these relationships. Section 2.4 describes ICT investment in the banking sector. The Libyan context of this research is then outlined in Sections 2.6-2.9.

2.2 Information and Communication Technologies

Advances in technology have dramatically changed the preconditions for service delivery in recent years, heavily impacting on self-service options and on service support. Service providers across most industries now employ technology at various stages in the service delivery processes and in service support operations to improve the quality and productivity of their service offerings. These technology-enabled changes are changing the way service providers and their customers interact with each other. Two influential forms of technology-based self-service are Internet banking and mobile banking (m-banking). Essentially, both of these channels allow customers to access their data and services remotely using Internet-enabled devices. Together, they are often referred to using the collective term ‘e-banking’ (i.e. electronic banking). The term e-banking will be used throughout this thesis to refer to both Internet banking and m-banking.

The ICT revolution has become key to the future development of the banking sector, largely due to its ability to enhance connections, communication, interaction and therefore relationships between customers and banks. Some banks have been driven to adopt e-banking because of customer acceptance of ICT (Wamalwa
2006). Others have independently recognized its ability to improve customer relationships by improving customer service strategies. Services for individuals can be enhanced by using ICT tools to increase interaction with customers (Wells et al. 1999). This interaction and relationship is reflected in customers’ decisions about their banking (Wells et al. 1999).

ICT is embedded in the operations of the banking sector in industrialized, economically developed countries. To a lesser extent, it has contributed to growth in customer relationships in areas of the Libyan banking sector. Indeed, this re-evaluation of the possibilities afforded by ICT has the potential to revolutionize the way banks use technologies to deliver services and to enhance convenience for customers (Rajagopal and Rajagopal 2007).

ICT incorporates the use of tools such as software, telecommunications, the Internet, voice conversations, images, motion pictures, and multimedia presentations and procedures associated with information technology to create greater interactivity with customers (Vogel 2005). Communication tools are used by banks to understand their customers and market dynamics through the established basics of the 4 Ps (i.e. products, price, place and promotion), and thereby build relationships (Costello and Tuchen 1998), move processes towards the individual customer (Leek et al. 2003) and make better products and services available at lower prices (Chesher and Linton 2003). ICTs are therefore significant for reducing costs and while improving flexibility.

In a study by Kardaras and Papathanassiou (2000), ICT was demonstrated to provide businesses with cheaper methods (both tools and activities) for accessing customers’ views and positions. These advantages have been common across diverse industries – for example, implementation of ICT tools to enhance communication helped the Tunisian manufacturing sector to attract customers (Mouelhi 2009). These communication tools are widely used in different industries and within a range of areas of business, having been now embedded in operations for over ten years in most cases (for example, see Costello and Tuchen (1998). Common communication tools include mobile phones, e-mail, Internet, audio and video conferencing.


2.2.1 Internet

Users commonly access the Internet using fixed line high-speed broadband options (such as ADSL) or wireless. Most customers perceive the Internet as a convenient tool that is easy to use and devoid of long-term risks. As a result, the Internet is widely used for the exchange of information including email, audio, video and image files (Alyabis 2000). Such ease of communication facilitates interactions that are not restricted by time and location limitations or by transition processes (Castells et al. 2004).

It has the potential to change business scope, and has a significant role to play in the growth of individual banks, banking networks and the sector as a whole. It also has an important impact on the relationship process between customers and providers of banking services (Fredriksson 2003). Banks that have an established understanding of their business processes can use Internet technologies to create a positive interaction between customers and banks (Yin 2002).

Walker and Neeley (2004) suggested that the Internet enables the creation of relationships with customers and provides rapidly increasing value for them because it allows access to each customer’s position, providing specific information around receiving services, which customers like. Customers can use the Internet to communicate with their banks remotely with completely dependability and confidentiality (Al-Sukkar 2005). Brown (2009) noted that, when available, customers choose to use banking services from various locations such as their homes, offices and Internet cafes.

Effective use of the Internet allows businesses to employ fewer staff while offering a consistent or enhanced range of services to customers (Ho and Mallick 2006). However, the rapid speed of changes within the Internet environment means that all businesses that use this technology must make large and on-going investments in IT to maximize the advantages it offers, both in relation to managing customer relationships (by leveraging lowest cost and the competitive environment) and providing business growth based on services.
2.2.1.1 Internet banking

The adoption of Internet technology in both developed and developing countries has impacted heavily on the banking sector. The move in banking from traditional to electronic delivery channels is impacting on internal business operations as well as customer relationships.

In developed countries such as USA and Australia, Internet technologies have been used by the banking industry and, for several years, banks have implemented strategies to encourage their customers to employ Internet banking. For example, an Australian study by Evans and Sawyer (2009) reported that 37% of businesses delivered services by the Internet to a customer’s position in 2007, compared to 21% of businesses using the Internet for this purpose during 2005-2006.

In developing countries like Libya, banks have not adopted Internet technology in a way that benefits from its usefulness and convenience (Al-Hajri 2008) despite the opportunities afforded by Internet banking for electronic relationships within the local marketplace (Evans and Sawyer 2009, Nasri and Charfeddine 2012). Internet banking is one of most important tools for engaging in online transactions and relationship building with individual customers, because it lets banks provide services unrestricted by traditional temporal and spatial borders (Xu et al. 2009). Consequently, the Internet can serve as an interactive channel for direct communication and information exchange between customers and banks (Alyabis 2000, Ahmed and Jamal 2007).

Internet-enabled customer service processes facilitate faster transactions than when done manually, and enhance decision-making as a result of all data being available online. It is possible to create better services for more customers and reduce resulting mistakes through Internet banking (Ahmed and Jamal 2007). Convenience is a key factor in this. Services usually available via Internet banking include checking account balances, transferring money, notifying customers of future bank changes and making bill payments (Brown and Buys 2005). The Internet both enriches existing channels and provides new channels which can comprehensively connect and build up services offered to customers (Day and Bens 2005).
2.2.1.2 Internet Banking Characteristics

The characteristics of Internet banking vary significantly depending on the development of the banking sector in the relevant country. While fully automated online systems (e.g. customers transferring funds and even obtaining loans without human interaction) are common in developed countries, e-mail confirmation of balances is perceived as advanced use of Internet Banking in developing countries.

The Internet has led to an explosion in new activities in the banking sector and to enhanced economic development in most nations (Alyabis 2000, Al-Hajri 2008). Specific characteristics of the Internet that have been found to impact on the rate of customers’ Internet banking adoption are reputation, protection, social desirability, compatibility, convenience and proficiency (Mastoori 2009). Xu et al.’s (2009) study suggested that Internet trust plays a serious role in Internet banking adoption and that security is important to proactively address customers’ concerns about online banking adoption. Therefore, implementations that leverage these characteristics of the Internet create increased efficiency and greater opportunities to engage with customers through service delivery (Dodds 1996, Alyabis 2000).

As noted above, perceptions of the effective and appropriate use of Internet banking functionality vary depending on the context. Al-Sukker’s (2005) study of Jordanian banking, notably undertaken in a developing country, reported important characteristics of the Internet as: the ability for banks to deliver detailed information about their services via the Internet in a short amount of time thereby informing decision-making and facilitating selection of suitable products; its ability to allow all users to view and access deals and self-service functionality and the facilitation of interaction between bank systems and customers, with a high degree of flexibility of communications and interaction. Here, the Internet is considered as one important element for banks to create relationships and attract non-customers. Internet interaction is commonly considered to refer to sending voice or electronic messages through e-mail, or a customer accessing their account from anywhere via e-mail.

This study by Al-Sukker (2005) also found that e-mail is one of the most effective technologies for delivering fast business responses and very high value for
customers. Bank employees use e-mail for communication with individual customers as well to send a message to all customers at the same time. Employees are usually aware that some element of communication quality may be lost when relying on e-mail communication, and many claimed that they did not trust the system; e-mail was used because it allowed them to save and read their e-mails at will. While these limitations are noted by the banking sector in developing countries, there has been slow progress in embracing more modern features offered by the rapidly evolving Internet environment.

2.2.1.3 Internet Banking Advantages

The Internet provides several advantages for both banks and customers. Most of these advantages result from the unlimited time and access it provides to banking information: 24 hours a day, 7 days a week (Al-Sukkar 2005, Karim and Hamdan 2010, Nasri and Charfeddine 2012). There are many advantages afforded by Internet banking; the only requirement for customers to benefit is that they must be able to access and use a computer with Internet access. In developing countries, even modems with slower access speeds provide the necessary facilities to engage in banking transactions from home, the office and any site where they would like to access and communicate with their bank (Al-Sukkar 2005).

Self-service functionality can reduce costs for banks as they require fewer staff and for customers as they are able to save time and travel costs. Self-service functions, delivered using the Internet, provide an opportunity for customers to check their bank account information and buy online. The Internet makes it possible for banks worldwide to interact with large numbers of customers and build relationships with them. In the year 2000 there were at least 360 million Internet users; in only one year this had grown to 673 million Internet users in 2001. The figure continues to rise rapidly, with the most recent estimates there were 2.1 billion users in 2010 and over 2.4 billion users in 2012 (Internet World Stats 2012, Central Intelligence Agency 2013). The Internet aims to eliminate (or at least reduce reliance on) traditional banking business services. In their place, information technology tools (such as the Internet, ATM network, fax and telephone) have created channels that enable service transactions from almost any location, and that allow continuous access to information and services, meeting the needs of customers who want to be
able to access services at a time that is convenient to them, rather than being restricted to traditional banking locations and opening hours (Milutinovic and Patricelli 2002).

Through the provision of more convenient services via the Internet, customers come to perceive that banks understand their requirements. Internet banking has the potential to create better relationships between banks and customers because it delivers facilities and facilitates relationships that fit into the lives of customers. The need for customers to commit additional time to visit banks to access services is diminished by Internet banking (Banerjee 2009). By offering greater services online than are delivered by more traditional banks, it is possible to enhance relationship processes with customers in a short amount of time (Mastoori 2009).

Brown and Buys’ (2005) study has shown that Internet banking enhances customer satisfaction while providing ease of use, security, transaction, payments and information content, and encouraging customer trust and innovation. These factors help customers to make positive decisions towards adopting online services with banks over a long period because the Internet has removed many interaction barriers between customers and bankers by eliminating the obstacles created by geography, time and location, thereby creating smooth business (Alyabis 2000).

The literature has identified many advantages for both the bank and customers with the use of Internet banking:

- Internet banking has the potential to reduce costs by providing customers with the ability to access their accounts without physically visiting a bank (Nasri and Charfeddine 2012).

- Internet banking enhances information exchange with the ability for a bank to accept feedback from individual customers (Alyabis 2000).

- Internet banking can enhance satisfaction, trust and loyalty of customers towards their bank (Al-Sukkar 2005).

- Internet banking has the ability to reduce service costs because the services are available 24/7. With some systems the customers can do anything from
checking an account balance to applying for mortgage (Al-Sukkar 2005, Day and Bens 2005).

- Internet banking also provides competitive advantage via cost reduction, positive word-of-mouth communication, better satisfaction, trust and loyalty of customers needs (Ahmed and Jamal 2007, Evans and Sawyer 2009).

- It can led to increased service efficiency for banks, with lower costs of operation towards customers and the avoidance of the loss of customers who probably would have switched to another bank without the flexibility provided by the Internet (Ahmed and Jamal 2007, Mastoori 2009, Xu et al. 2009).

The Internet has offered significant potential for expanding the financial marketplace by creating new customers, reducing costs and improving profit margins for banks (Alyabis 2000). As well as removing customers’ geographic restrictions, Akel (2001) found that the Internet has been useful for banks to expand their service offerings to a wide range of customers over a broad geographic area. Internet banking can improve banking management for most customer relationship processes and it provides opportunities to expand a bank’s marketplace more broadly than other banks that do not utilize Internet banking (Xu et al. 2009). The Internet can be viewed as a support to bank structures (Akel and Phillips 2001).

Day and Bens (2005) found that banks that focus their strategy on the delivery of quality and value via close customer relationships through the Internet have improved their overall market growth rate. As a result, the Internet is a far reaching technology that can provide a link to existing customers and be used as a solution to their challenges. It gives customers the ability to judge the quality of banking services using websites, and then choose suitable services from their offices or homes based on their personal needs. The Internet has allowed banks to reduce the number of traditional interactions with customers while maintaining strong branding and customer loyalty, leading to enhanced banking services, free bill payment and positive customer relationships (Osho 2008).
Ab-Hamid’s (2006) study suggested that online customers are more value oriented than traditional customers. Customer value is defined as “a relativistic preference characterizing a consumer’s experience of interacting with some objects such as services, things or ideas” (Holbrook 1999 cited in Ab-Hamid 2006, p.21). Customer value is the perceived benefit that a customer gains after using certain services, as against the experience of other individuals. Defining the term ‘value’ more broadly, customers gain value when they benefit from what they give up or from risks they face.

The Internet has highlighted the importance of new business tools in interaction and communication with customers; it has the capability to instantaneously exchange real information that has high value (Moen et al. 2008). In short, the use of ICT, and specifically the Internet, in the exchange between banks and customers has changed customer value because Libyan banks are suffering great pressure from competition, and so are attempting to adopt new ICT to achieve competitive advantage (Vogel 2005).

In summary, banking via the Internet can provide fast, low cost, high value services for customers with a high degree of locating and time convenience (Ahmed and Jamal 2007, Mastoori 2009, Karim and Hamdan 2010).

2.2.2 Mobile Banking

Recent modernizations in telecommunications have enabled the start of new access methods for banking services, with mobile banking (m-banking) one of the most significant technologies to achieve broad penetration in recent years (Donner and Tellez 2008). M-banking is defined as “a channel whereby the customer interacts with a bank via a mobile device, such as a mobile phone or personal digital assistant” (Laukkanen and Pasanen 2008). This ability for banks and customers to interact using mobile devices is attractive to customers (Scornavacca and Hoehle 2006), requiring only that they own an Internet-enabled mobile smart phone that is able to access the mobile application offered by their bank. M-banking has provided the greatest opportunity in recent times for banking institutions to introduce new services to customers (Amin 2008).
M-banking is the most important distribution and communication channel for retail banking (Pouyttchi and Schurig 2004), and has significantly changed the way in which many customers access their bank account. Despite the popularisation of m-banking globally, there has been low demand for the service in developing nations such as Libya, and little to explain this situation. Libyan banks have traditionally delivered services through face to face interactions with customers at branch offices (Dewan et al. 2009), and this is still common practice.

Given that mobile phone penetration figures indicate that there will soon be more users of mobile phones in developing countries than in developed ones (e.g. more than 800 million mobile phones were sold in developing countries in 2003). Recently, mobile phone penetration rates were 79% in 2011 and increased to 89% in 2013 in developing countries on average (International Telecommunications Union 2013) m-banking has the potential to be a popular method of service delivery for developing countries.

The mobile phone adoption and penetration rate in developing (Arabic) countries is shown in Table 2.1, below for data gathered by West (2008) and Deloitte (2013). Although the evolution of mobile services is still at an early stage in most Arabic countries, and access to the Web over mobile phones is a small proportion of the mobile phone space as a whole, compared to the SMS texts sent.

Table 2-1: Rate of mobile phone adoption and penetration in Arabic countries (Deloitte report 2013)

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</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>2%</td>
<td>4%</td>
<td>7%</td>
<td>8%</td>
<td>11%</td>
<td>19%</td>
<td>24%</td>
<td>36%</td>
<td>48%</td>
<td>105%</td>
</tr>
<tr>
<td>Jordan</td>
<td>-</td>
<td>17%</td>
<td>24%</td>
<td>-</td>
<td>5%</td>
<td>30%</td>
<td>57%</td>
<td>78%</td>
<td>83%</td>
<td>143%</td>
</tr>
<tr>
<td>Sudan</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>5%</td>
<td>12%</td>
<td>19%</td>
<td>-</td>
<td>73%</td>
</tr>
<tr>
<td>Algeria</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>5%</td>
<td>15%</td>
<td>42%</td>
<td>63%</td>
<td>81%</td>
<td>-</td>
<td>109%</td>
</tr>
<tr>
<td>Morocco</td>
<td>8%</td>
<td>17%</td>
<td>21%</td>
<td>25%</td>
<td>31%</td>
<td>41%</td>
<td>52%</td>
<td>64%</td>
<td>-</td>
<td>119%</td>
</tr>
<tr>
<td>Libya</td>
<td>1%</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
<td>9%</td>
<td>34%</td>
<td>66%</td>
<td>73%</td>
<td>-</td>
<td>129%</td>
</tr>
</tbody>
</table>

2.2.2.1 M-banking Services

Most banks worldwide now deliver diverse services and solution for customers using m-banking. Once a customer has established an account with a bank and
deposited money into that account, they can usually manage their money and bank interactions through their mobile device. Basic implementations use short message services (SMS), while more advanced ones use mobile applications and mobile web interfaces (Scornavacca and Hoehle 2006, Laukkanen and Pasanen 2008, Dewan et al. 2009).

M-banking implementations usually include facilities to conduct banking transactions and access information through the use of a mobile phone. The benefits of m-banking are listed below:

- M-banking provides access to bank and account related information anytime anywhere through the use of a mobile device. The bank can provide different services to customers through m-banking including balance inquiry, shopping, fund transfer, and bill payments (Byanjankar and Sharma 2012).

- M-Banking can be progressively used by customers, allowing for enhanced customer relationships and improves loyalty. M- Banking creates new ways to generate real-time customer experience (Vaidya 2011).

- Through the use of mobile devices banks can automate advanced alerts (account alert) in real-time. There is the potential to have systems in the mobile system to allow a customer to push a call button which connects them to a bank services agent (Mobile Marketing Association 2009).

- M-banking has ability to conduct electronic payments (Vaidya 2011).

- M-banking application facilitates numerous banking services such as access account balances, making deposits and withdrawals, transferring money (Morawczynski and Miscione 2008, Khraim et al. 2011).

**2.2.2.2 M-banking Enablers and Considerations**

Inherent in m-banking are numerous features that facilitate its success. These are supported by broader technology adoption and Internet penetration trends. Many of these features have already been highlighted in discussions above relating to the Internet and m-banking generally. However, due to the nature of technology, there
are challenges associated with many of these enablers. The enablers and associated considerations can be summarised as:

- A growing mobile smart phone user base naturally creates a larger audience for m-banking (Yu and Guo 2008).

- Growing access to free or low cost Internet access, including wireless, has made m-banking more accessible, portable and convenient, regardless of location (Castells et al. 2004, Ivatury and Pickens 2006, Dewan et al. 2009, Yu 2009). This is often referred to as ‘perceived mobility’.

- M-banking is easy to use and builds on technologies that customers are already familiar with (Yu and Guo 2008, Mobile Marketing Association 2009).

- Customers are becoming more accepting of self-service situations (e.g. at supermarkets), and hence view the ability to conduct m-banking as giving them control over their position (Dewan et al. 2009, Yu 2009, Zhou and Lu 2011).

- Customers generally perceive M-banking as cost-effective and time-saving, and banks also see it as a cost reduction measure (So and Chung 2005, Ivatury and Pickens 2006, Rajagopal and Rajagopal 2007, Zhou and Lu 2011).

- Customers generally perceive m-banking as secure (So and Chung 2005, Ivatury and Pickens 2006, Rajagopal and Rajagopal 2007, Zhou and Lu 2011). However, theft of access codes, finances and personal data is a significant concern. This is especially problematic when customers move from access on fixed Internet devices to m-banking, where devices are more easily lost or stolen (Ghosh and Swaminatha 2001).

- Customers now expect immediate access to personalised information and completion of banking tasks (transferring money, paying a bill), and m-banking provides this flexibility (So and Chung 2005, Ivatury and Pickens 2006, Rajagopal and Rajagopal 2007, Zhou and Lu 2011).
• Customers like having access to information and services through multiple access channels (Mobile Marketing Association 2009, Yu 2009), and m-banking is generally accepted as increasing communication between banks and customers (So and Chung 2005, Rajagopal and Rajagopal 2007).

• Customers do not need to invest time or money to set up m-banking (Mobile Marketing Association 2009, Zhou and Lu 2011). Upgrades of m-banking applications must occur automatically so the customer is not burdened with unnecessary interactions that deter them from use. Banks unable to meet the performance and reliability expectations may lose customer confidence (Castells et al. 2004, Turel et al. 2007, Coursaris et al. 2012).

• Access through mobile phones, which have the ability to overcome customer distinctions such as urban or rural, rich or poor, leverages familiar smart phone functionality, access to billions of customers, wireless infrastructure, and low cost handsets (Parikh 2007, Walford 2008).

• Customers can receive faster responses to issues, with common queries resolved up to 60% faster using m-banking than by telephone banking (Yu 2009).

• Banks are differentiated based on their m-banking offerings, often due to the enhanced customer experience provided (Zhou and Lu 2011). Banks must invest in m-banking infrastructure that can handle exponential growth in the customer base. With m-banking, the customer may be in any part of the world at anytime, hence banks need to ensure that the systems are up and running 24 hours a day and 7 days a week. As a result, customers will find m-banking more and more useful and their expectations from the solution will increase (Castells et al. 2004, Turel et al. 2007, Coursaris et al. 2012).

• Provision of a secure infrastructure for banking service transactions over wireless networks is essential. This includes physical security of the mobile device; security of the customer application running on the device (e.g. use of customer identifier and password to access m-banking; corroboration of the device with the service provider before initiating a transaction; customer identifier and password authentication of the customer; encryption of the
data being wirelessly transmitted; and encryption of data stored on the device for later offline analysis by the customer (Castells et al. 2004, Turel et al. 2007, Coursaris et al. 2012).

- Given that m-banking offerings are mostly value-added services, with the mobile phone acting as a new channel to operating an existing bank account, it is necessary to modify the delivery of such services to include rural customers and those not already using banking services. While m-banking is growing in popularity, banks have yet to shift the access frontier in order to ‘transform money’. M-banking presents a great opportunity for the provision of banking services to those who do not have a bank account. In addition to technological and economic innovation, policy and regulatory innovation is needed to make these services a reality (Comninos et al. 2008).

- While the mobile phone is one of the most promising channels for using banking services by Libyan customers, it has not been widely adopted to date. The platform offers a convenient additional method for managing money without negative impacts on accessibility and affordability. Mobile phone operators have identified m-banking systems as a potential service to offer most customers (Laukkanen and Pasanen 2008).

- Performance-to-price advantage is important to customers. While early implementations may have imposed a cost on customers, current technologies offer a major benefit for users using m-banking and performing banking transaction functions through a mobile device, so the ‘value for money’ issues is likely to positively influence the adoption of m-banking services in Libyan banks (Yu 2009).

2.3 Online Customer Relationships

Interaction between customers and banks, facilitated by ICT, requires the creation of a relationship that is beneficial to all parties and ideally leads to profitable activities over time (Elgahwash 2006). The success of customer relationships relies heavily on the collection and analysis of customer information. Knowledge about individual customers can strongly guide banking strategies. Hence, technologies
such as Internet banking and m-banking have the potential to lead to the implementation of more effective marketing strategies (Portuese 2006).

Customers are a major factor in the relationship process because they have control of their level of engagement. Banks can establish a comfortable environment to help their customer by adapting online offerings based on feedback received. The information exchange process can improve customer relationships (Murphy et al. 2009).

Customer relationships can be deepened by using multiple and varied services from the same provider such as checking accounts, credit cards, saving money and getting loans. Customers’ benefits can include added convenience and potential higher service levels, facilitated by the use of modern technologies (La and Kandampully 2002, Agarwal et al. 2009).

Case-based research suggests that successful banks are driven by the desire to provide service, quality and innovative problem solving in support of their customers. The assumption of customer sovereignty is reflected in slogans such as: keep close to the customer, delight the customer and make the moment of truth an unforgettable experience (Cutcher 2004). Customers are at the heart of most banks’ operations and this is especially true for service providers in banks. In order to serve their customers better, businesses have to introduce reliable processes and procedures for the interaction with their customers; this is known as customer relationship management (Nauck et al. 2006, Rose and Fogarty 2006).

Excellent customer service will give a bank competitive advantage. Literature that claims banks achieve competitive advantage through better customer service is based on the largely flawed but powerful concept of the sovereign customer and free markets. It is assumed that the sovereign customer makes rational, informed decisions and is free to choose. Actually, customers do not always act in rational ways and banking services are not passive agents waiting for customer demands (Cutcher 2004, Ndubisi 2007).

The emergence of ICT has altered the way customers do business, communicate with each other and perform other daily activities. Customers are shifting to ICT
channels as they perceive greater customer value. Although ICT is sighted as another marketing channel for banks, online customers behave differently from those using traditional channels. For example, online customers are demanding different relationships from the service providers (Ab-Hamid 2006).

In this competitive banking era, the customers of each bank constitute one of the most importance assets that a banking institution should preserve and continuously expand. As customers are of significant importance, it is essential for banks to satisfy their needs and wants. Banks use various techniques to establish and maintain long term relationships of trust between them and their customers (Mylonakis 2009).

Multiple channel integration builds up forms of customers’ relationships (Banerjee 2009). For example, the number of online banking accounts in developed countries has grown from 26 million during 2000 to 66.2 million in 2003. ICT is encouraging customers to accept services tasks with banks by exchanging information in a confidential manner (Banerjee 2009, Mastoori 2009).

Technology adoption has the potential to affect existing positive relationships between customers and banks (Al-Hajri 2008, Al-Hajri and Tatnall 2008, Al-Hajri and Tatnall 2008). A similar study by Banerjee (2009) provided evidence that banks are able to create personal interaction opportunities when their staff can build a relationship between the banking sector and customers through the adoption of the Internet and m-banking. Despite the benefits arising from strong customer relationships, most banks in Libya have stopped interacting with their customers except when initiated by the bank; after locking customers into services, banks often ignore the voice of customers trying to have their needs met (Anand and Galeotic 2006). However, the ability to maintain customer loyalty is essential to long-term business feasibility and the profitability of banks. Because of this, every effort should be made to not only meet customer expectations but to go over them (Nazari et al. 2012).

2.3.1 Customer Classifications

Online banking services face a number of challenges when interacting with customers. One of these challenges is to effectively determine a particular
customer’s needs and preferences, since knowledge about the customer is essential for the establishment of effective personalized services. One successful way of understanding customers is by collecting comprehensive information about the customer and converting this information into a set of knowledge in a customer profile (Ntawanga et al. 2008). Any such classification must be done automatically for it to be cost-effective. Therefore, customer profiling is required. There are a number of classification mechanisms for such customer profiling.

One study classified customers into 28 types (Portuese 2006). These classifications included silent customer, frequency customer, hurry customer, slowly customer, old customers, quiet customer, friendly customer, lovely customer, lie customer and positive customer. While these classifications suggest a set of standard and definite characteristics for each customer, even within these types most customer relationships fall along a spectrum, ranging from no relationship to high commitment and emotional bonds (Portuese 2006).

A similar study by Elgahwash (2006) provided a model to classify customers at a counter. This study focused on four types of customers:

1. Customers with several requests requiring quick answers to their questions and needs. These customers create positive interactions when banking services exceed their expectations. They have a strong personality and positive feelings towards banks.

2. Friendly customers are those who like to connect with others and grow relationships with them. They have a friendly personality, are non-sensitive in terms of time, give positive comments and prefer to speak about the most important advantages.

3. Complaining customers are more sensitive towards others, are unbelieving, quick to anger, have no respect for other and seek continue to control rules and reality.

4. Quiet customers do not respond well to change, are noncommittal about the result of services, are logical, and accept small challenges without question.
From the perspective of banks, customers are usually divided using a pyramid composed of four levels: platinum, gold, iron and lead. At the top of the pyramid are a small percentage of customers (platinum); these are heavy users and contribute a large share of bank profits. These customers require a good relationship maintained through interactive technology tools (Boyd et al. 2004). The gold tier includes a larger number of customers, but individual customers contribute less profit towards the banks because they are price sensitive and do not have a strong relationship with their bank. In the lower levels of the pyramid, customers tend to generate low revenues for banks, however some are important as long-term customers because they will probably escalate to the platinum tier in the future (Schmeisser et al. 2009).

2.3.2 Dimensions of Customer Relationships

Banking technologies are an interactive medium. Given the high interactivity enabled by Internet- and m-banking, whether interaction may occur is no longer an issue; ICT creates opportunities for enhanced interactivity. A higher level of interaction creates opportunities for banks that enhance the speed of building relationships. It is an essential process for customers to access information that will answer their questions (Portuese 2006). The important dimensions of the ICT-enabled relationship process in the banking sector are outlined below.

2.3.2.1 E-Customer Loyalty

It has been shown that, in some cases, customers have loyalty towards certain banks because banks use modern channels to hold and connect with customers (Bove and Johnson 2006, Toelle 2006). It is important to identify the successful and necessary work requirements of the customers to provide a solid financial basis for the bank by meeting their needs and desires in order to build a base of loyal customers. In general, a banker and customer relationship upgrade to the ranks of personal relationship contributes to the formation of a loyal customer. Loyal customers, when faced with the same question several times, tend to rely on their bank’s
recommended solution. In this case the bank and the customer relationships are complementary to each other (Elgahwash 2006).

In general, using a new technology to enhance customer relationships and customer loyalty is not easy to achieve because it relies on customer adoption of that new technology (Thao and Swierczek 2008). This section argues that the use of ICT by customers can lead to increased customer loyalty in two ways. First, customer loyalty is created by directing bankers when they use technologies to provide services with high value (i.e. quality interactions). Second, there is a direct path between customer trust in ICT and customer satisfaction (Bove and Johnson 2006).

Customers must have trust (See Section 2.3.2.3), in the relationship with their bank, established through repeated positive behaviour, before they are likely to use modern technologies for dealing services. A recent study highlighted the importance of ICT in enhancing customer relationships and how ICT has affected customer satisfaction, which in turn leads to loyalty (Ab-Hamid 2006). This thesis is based on the premise that it is not possible to achieve customer loyalty without achieving trust and satisfaction in the use of ICT applications for banking.

Yen and Gwinner (2003) provided evidence as to the central role that an existing positive relationship between customers and providers plays in understanding behaviours exhibited via the use of ICT, such as word of mouth, customers’ behaviour, commitment to the bank, and customer satisfaction with bankers. These factors work to support and directly influence customer loyalty.

Many definitions of loyalty have been proposed. For example, Ab-Hamid (2006) described customer loyalty in numbered stages. In the first phase, namely, cognitive loyalty, customers have preferences towards a particular bank over other alternatives in the delivery of service quality. Once they are satisfied, affection will come into play, that is, where the customers will move into the affective loyalty phase. In this second phase, customers develop likings and positive attitudes towards the bank. With a continuous positive experience, the customers move into the cognitive loyalty phase; that is, a phase where they have intention and commitment to repurchase. This intention to purchase becomes readiness to act as a result of the confluence of the previous three stages. Therefore, customer loyalty
that drives profit growth can only be built through a consistent customer experience. This means understanding each individual customer’s needs and preferences (Russ 2006), the importance of which was outlined above. Thao and Swierczek (2008) described customer loyalty for e-services using intention to use the service in the future, increased current usage and promotion by word of-mouth recommendations.

The concept of loyalty is more closely aligned with customer behaviour than with a business’ position. Loyalty has various definitions, including (Ab-Hamid 2006, Elgahwash 2006):

1. Known loyalty expressed through an individual’s non-random purchasing, expressed over a period of time through consistency of decision-making;

2. A deep commitment to repeat purchase and re-engage with the product (brand, or service) in a way that will always be preferred in the future, regardless of external indicators or efforts.

The ability to maximize customer loyalty through close and durable relationships is critical to banks’ ability to grow their businesses. As banks attempt to create and manage customer relationships, several emerging trends affect the approach and tools banks employ to achieve sustainable growth (Russ 2006). Most customers are willing to pay more money to get the best services, particularly after they have committed to a certain bank; at this point they are less sensitive to higher prices and more accepting of their bank’s mistakes. Indeed, a loyal customer is an important source of profit secured with a higher share in the marketplace of the bank. The definitions above focus on behavioural loyalty and provide evidence that customers are likely to repeat purchase, and will enhance and add value to the bank, when they promote the bank to their friends - this indicates their satisfaction (Elgahwash 2006).

Consequently, building customers’ loyalty is a difficult process for most banks, especially in Libya, because some banks have been unsuccessful in building true customer loyalty (Bove and Johnson 2006, Abdollahi 2007, Deng et al. 2010). The literature has shown that customer loyalty expresses the behavioural intention related to the individual services by banks. For example, bankers who accept
customer word of mouth opinions with respect and kindness create positive customer feelings towards the bank’s service employees (Bove and Johnson 2006, Toelle 2006).

Customer loyalty is one of the major factors in the relationship process because loyal customers are more likely to continue to have interactions with banks. As a result, loyal customers are profitable because the achievement costs have already been absorbed and, over time, customers tend to buy more services from the banks (Wamalwa 2006, Eid 2011). Also, customers become more experienced with the bank’s services, creating less stress, fewer mistakes and a greater contribution to the bank (Al-Hajri and Tatnall 2008, Chung and Kwon 2009). Loyalty to a bank has been related with interactions between individual bankers and customers; successful banking operations reflect a positive relationship between them (Bove and Johnson 2006).

Customer loyalty is an important contributor to earnings for banks, because customers may buy a range of services over a number of years (at least five years) and, give positive word of mouth recommendation for others (family, friends); customers become more profitable when they stay with the bank for the long term ( Luarn and Hui Lin 2003, Hoq and Amin 2010). This process of interaction between customers and bankers in the banking environment make it possible to generate positive relationships, which leads to customer loyalty (Ab-Hamid 2006, Bove and Johnson 2006, Seok Lee 2010).

Achievement of customer loyalty requires the development of a long-term strategy. The ways in which loyalty is established requires the following steps (Elgahwash 2006).

1. Develop staff skills that enable them to build positive and strong relationships with customers. Customer satisfaction with bank staff will enhance customer satisfaction and connection with the bank.

2. Provide a service to build customer loyalty; this should be articulated as one component of the overall service delivery strategy. The creation of unexpected and unusual benefits that exceed customer expectations will
build satisfaction and a unique advantage in the market. The service must have high service quality and customer value.

### 2.3.2.2 E-Customer Satisfaction

Online customer satisfaction refers to customer satisfaction in an online relationship, and is defined as a long-term, developing construct influenced by customers’ electronic service expectations and quality perceptions which change over time, based on new customer experience and knowledge (Kim et al. 2009, Flint et al. 2011). Customer satisfaction with ICT is supported by convenience, site design, financial security, interaction capabilities, efficiency, ability to meet needs, and customer power (Portuese 2006, Kabadayi and Gupta 2011). These are the dominant factors in customer assessments of e-satisfaction.

Customer actions can be predicted based on historic information about actions by individual customers (Nauck et al. 2006). Most banks run some form of customer surveys to understand customer views. For example, banks want to understand how their service image is perceived from the customer’s view, whether customers are satisfied with a certain service by the bank, or, whether customers are happy to recommend the products and services that they use. Banks also want to understand the potential of new services and channels, such as ICT, on the satisfaction and loyalty of customers.

When customers are satisfied with previous services, they are inclined to believe that the bank will provide another satisfactory experience (Portuese 2006). Satisfaction is dependent on the customer’s assessment of their provider’s performance against their own expectations. This cognitive evaluation is concerned with the customer’s experience with after-sale experiences, that is, in relation to perceived performance and expectations, which are formed from the customer’s past experiences, advice from friends, and information from marketers or competitors (Ab-Hamid 2006).

Hallowell (1996) suggested that customer satisfaction has a positive affect on customer loyalty. Satisfaction can be defined in several ways, such as, an individual’s feelings towards the services of banks and, continuing to buy services
from the same bank and increasing that relationship. A good relationship with customers in the long term helps to create loyalty. It satisfies understanding of customers’ requirements and helps in meeting customers’ expectations with high value (Aldlaigan and Buttle 2005). Toelle’s (2006) study revealed that customers’ feelings of satisfaction rise when they compare their opinion of actual services performance to their previous expectations. Positive confirmation occurs when the service performance exceeds the customer’s expectation, and this improves general satisfaction with the bank (Agarwal et al. 2009).

The literature has reported that customer satisfaction is the result of a customer’s view of the value received, which is, in turn, affected by service quality relative to relationship processes (Hallowell 1996). A positive relationship between service quality and satisfaction has been well established in the banking sector. However, the constructs are highly correlated and sometimes difficult to separate in transactional interactions, but even more so from a relationship perspective. In long-term relationships, perceived quality and satisfaction are likely to merge into an overall evaluation of relationship satisfaction (Leverin and Liljander 2006) (Eichorn 2004).

On the other hand, a previous study by Aldlaigan and Buttle (2005), has reported that customer satisfaction in itself is not enough of a factor to ensure a long-term relationship with customers because banks should be continually improving the way they interact with customers. Loyalty must be managed on a proactive and on-going basis. This situation is highlighted in the Libyan banking sector, where most Libyan banks have reported a high level of dissatisfaction from long-term customers as result of adherence to tradition and the increasing degree of competition between banks.

2.3.2.3 E- Customer Trust

Technology is important because it facilitates increased trust in online banking services. It increases interactions (facilities, exchange of information, quality) that contribute to the relationship between customers and banks (Kartiwi 2006, Ledbetter 2007). In particular, communication with individual bankers can establish a high level of trust and form strong relationships with customers. Trust occurs
when customers perceive the services and banker behaviours as unique compare to other employees (Bove and Johnson 2006). Trusting relationships provide an opportunity for customers to establish a strong foundation of satisfaction leading to loyalty.

Trust refers to confidence in the reliability and integrity of an exchange of services; it is an important independent benefit of a long-term relationship (Ab-Hamid 2006). Trust in online banking services suggests that customers have a willingness to rely on the bankers and take action in circumstances where such action makes the customer vulnerable to the bank (Hou 2005). Laaksonen et al.’s (2008) study found that trust is a quality aspect of customer-bankers interactions, particularly relevant to technology-based interactions after the initial service delivery. Trust plays an important role when using ICT tools because they are a complementary resource that is increasingly being considered more important by customers and banks.

Trust and satisfaction have complicated roles in technology channels in relation to customer behaviour (Portuese 2006). Trust is required in Internet- and m-banking services to establish a relationship that enables the customer and the bank to make transactions. Trust is a mechanism between a customer and the bank, and contributes to ensuring that customer expectations are satisfied or successfully transacted (Wamalwa 2006).

2.3.3 Factors Supported by Online Customer Relationships

This section presents the key elements from the perspective of customer adoption of ICT enabled banking. Through the implementation of Internet- and m-banking, banks need to consider how these technologies will influence customer interactions and how to maximize revenue opportunities and improve customer loyalty.

2.3.3.1 E-Privacy

Privacy generally refers to the hiding of some information, which is distinct from other information that involved parties are willing to share with others. Privacy is defined as “the claim of individuals, groups, and institutions to determine for themselves, when, how, and to what extent information about them is communicated to others” (Westin 1967). This definition has been used in previous
studies of online banking (Ahmed and Jamal 2007, Ahmed et al. 2007). Privacy generally includes the right of individuals to determine for themselves when, how, and to what extent information about them is communicated to others (Ghosh and Swaminatha 2001, Jutla and Bodorik 2003, Cracknell 2004, Ahmed et al. 2007, Avidan and Butman 2007, Peterson et al. 2007).

Using modern technologies, it is possible to collect enormous amounts of customer information via the Internet and m-banking. If managed correctly, this information can provide huge value to a bank. Fair information practice principles should be embedded in technology use to allay the concerns of customers and bankers about privacy issues associated with the use of online services (Wamalwa 2006).

While it is now common to assume that the customers and banks can secure their data exchange, some customers are interested in a stronger level of security that allows them to hide their data from the bank as well. This is also true from the perspective of banks, who would like to maintain privacy of company data as much as possible (Avidan and Butman 2007).

Electronic privacy brings opportunity for businesses to make major gains. Sound electronic privacy protection can create a virtuous circle in which both the business and its customers benefit. If customers trust the business, in return they will provide better quality personal information. This allows the business to address customer needs more accurately and more cost-effectively. All these factors mean that banks that engender greater trust through sound protection of privacy are more likely to get closer to customers, thus retaining their loyalty and their business. Therefore, privacy is at the heart of the business and customer relationships. It involves crucial issues about the power, value, the use and potential for abuse of personal information (Jutla and Bodorik 2003).

**2.3.3.2 E-Security**

Security requires a plan to provide guidance to ensure that the handling of sensitive information is automated whenever possible, that electronic systems are protected commensurate with Internet banking standards, and data is protected from the risk of inadvertent or deliberate disclosure, fraud, misappropriation or espionage.
Indeed, banking services are successful when they are based on information processing operations that are protected from incidents of hardware, software, or network failure resulting from human carelessness, intentional abuse, or accidental misuse of the system (Wamalwa 2006).

Customers are often concerned about online payment security, since they have to provide their personal details and credit card information in the ordering process. This concern increases the perception of risk and simultaneously reduces the level of trust in online banking, which in turn adversely affects satisfaction. Hence, online banking that clearly communicates to customers about how their private and transaction data are secured are more likely to benefit from increased customer satisfaction (Ab-Hamid and Kassim 2004, Ab-Hamid 2006).

Online security features allow banks to provide confirmation, access control, confidentiality and non-repudiation when handling online transactions. Authentication technology ensures that only authorized personnel have access to data, applications, network and communications. Access control is the procedure for activating and deactivating permissions of users in order to allow them to access the information technology resources (Wamalwa 2006). Therefore, security of service transactions can be executed from some remote location and transmission of service information over the air (Brown and Buys 2005, Abu-Jaber 2007).

2.3.3.3 E-Reliability

Reliability, in the case of banks, is extremely important. Customers expect that the service that they receive will be precisely in accordance with the bank’s offer (Urbanowicz 2008). Reliability is the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials. Thus, reliability refers to the degree to which a measure is free of variable error (Maenpaa 2010), so it concerns the availability of systems, accuracy of system calculations and the ability of systems to recover from failure (Zo 2006).
2.3.3.4 E-Availability

The rapid growth in technology capabilities and the emerging pervasiveness of digital technologies within the information society has significantly revolutionised business transactions, trade and communications between people and banks. With Internet- and m-banking, a customer may be sitting in any part of the world, and have access to banking services anytime, anywhere. Hence, banks must ensure that their systems are truly up and running 24 hours, 7 days a week. As customers understand technologies more and find them more useful, their expectations about the bank’s solution will increase. Most banks target and offer m-banking or Internet solutions on any type of device via a web browser, however some still restrict communication to SMS (Ahmed et al. 2007).

2.3.3.5 E-Convenience

Perceived convenience is recognized as one of the most important factors in customer choice behaviours in general, and particularly in electronic banking. However, customers see the definition of convenience differently. Customers define issues like bank location and opening hours as convenience features, whereas more self-oriented customers relate convenience to ATM availability and online banking. In the electronic banking arena, 24-hour service availability, freedom from place, and time-saving were related to convenience (Laukkanen and Pasanen 2008). Convenience includes the location of the bank, hours of operation, speed and efficiency of employees and sometimes even extends to the availability of car parking. In short, convenience is anything that is intended to save resources, time and energy or avoid frustration (Katircioglu et al. 2011).

2.3.3.6 E-Profitability

Numerous studies have shown positive links between loyalty and bank profitability. Nonetheless, not all loyal customers are profitable. The overall link between loyalty and profitability in many industries is questionable for two reasons: a relatively large percentage of long-term customers are only marginally profitable, and a relatively large percentage of short-term customers are highly profitable. Customer relationship profitability arises through the acquisition and retention of ‘high
quality’ customers that create low costs and high revenue. Retail banking often describes relationship costs as comprising direct variable costs, such as transaction related costs and costs related to specific transactions (Leverin and Liljander 2006).

It is premised on the belief that developing a relationship with customers is the best way to retain them and generate loyalty, and that loyal customers are more profitable than non-loyal customers. This is because a small increase in the customer retention rate may lead to a dramatic increase in profits. Consequently, it is obvious that relationships help to create loyalty, which in turn has a positive effect on profitability (Ab-Hamid 2006).

Some banks are able to focus on profitable customers through efficient segmentation according to individual behaviour. Information about ‘who buys what and how much’ enables the bank to have a commercial approach based on the customer and not solely on the product. Thus, the bank is able to better satisfy and retain its customers (Hallowell 1996, Krasnikov et al. 2009, Agbolade 2011).

**2.3.3.7 Affordability**

A significant number of ICT customers are influenced by low prices, which in turn affects satisfaction. As the cost of searching for information decreases, customers are more likely to compare prices and seek more value in services that they want to buy – which may lead to hunting for lower prices. Customers who experience a higher level of overall satisfaction tend to be less price sensitive. For example, customers who find that the overall service quality and ordering process offered by banks are superior to those offered by other competitors are unlikely to switch banks, despite a marginal increase in price (Ab-Hamid 2006). Switching costs, which are those costs incurred when customers change banks, also impact on customer decisions. They include defined switching costs (i.e. actual financial charges) as well as the varying amounts of time and money incurred by each customer when deciding to move to a different bank (Portuese 2006).
2.3.3.8 Accessibility

Accessibility refers to customers’ expectation that banks and their employees will be always available, regardless of the customers’ location (Urbanowicz 2008). Accessibility is a general term used to describe the degree to which technologies, devices, services, or an environment is accessible by as many people as possible. It can also be viewed as the "ability to access" some possible benefit of some system (Pal et al. 2010).

2.3.3.9 Usability

Usability refers to the ease with which customers can employ a particular tool for an achievement object, in order to achieve a particular goal. This can include technologies, communication, services and tools required to achieve a goals or to interact with customers (Flavian et al. 2006, Al-Hajri 2008, Al-Hajri and Tatnall 2008, Green and Pearson 2009).

2.4 ICT Investment in the Banking Sector

ICT is becoming an essential requirement to support the different products and services that banks offer their customers. ICT in banking has had a positive effect on customers through enhanced services (Aterido et al. 2009). It offers many advantages and opportunities for banks, with the resulting changes affecting interactions with all customers (Elalagg 2003, Rajagopal and Rajagopal 2007).

ICT affects banking in the support of customer services in two ways. Firstly, most businesses are looking to reduce costs in areas such as training new workers and paper use. Secondly, it provides a good way for customers to have access to a bank’s services. As one example of a change facilitated by ICT, ATMs are used by customers (reducing staffing costs) to move money between branches around the world (giving greater access), leading to reduced costs in the banking network. Currently, the ATM system has perceived usefulness (Rose 2007), but it is recommended that more services in different locations should be offered to create positive relationships with customers and higher profits for banks. The banking sector in Libya is now expanding to use other alternate channels for customer service delivery, such as computer banking, phone banking and the Internet.
ICT investment in banking services increases incentives for customers through improved business processes. It is possible to change the design of the banking sector to improve business knowledge. Many businesses attempt to deliver sustained competitive advantages when they move and control decision variables in customers’ orientation toward banking services. Moreover, banking services that adopt ICT in the pursuit of a changed business environment need to focus on the collective operations (systems, bankers and customers), because these operations enhance the relationship strength between ICT investment in banks and positive interaction with customers. It is an interaction strategy that can take full advantage of business value in the relationships process (Yin 2002, Chen et al. 2006).

Some studies in this area use evidence that ICT has given facilities to the banking services, which depend on increased relationships and communications between inter relationships and individual customers, because banks include a central decision making system to support all business, which is provided to customers by ICT (Shin 2004, Chen et al. 2006). Furthermore, it allows the banking sector to attain great investments in ICT and it finds benefit from those facilities such as a reduction in costs of sources via coordination with a fixed strategy for customers. Automated systems allow more effective management of deposits and loans, thereby maximizing profit via their loans operation (Shin 2004, Chen et al. 2006).

ICT is an essential factor in achieving a high level of positive effects on banks and, in turn, improving customers’ relationships (Yin 2002). Many banks are decreasing operating costs through opportunities to serve their current customers while they attempt to attract new customers by providing new excellent services with convenience of value. This creates a strong motivation for banks to anticipate sophisticated risks and deal with them before they occur. Thus, it is clear that banks can adopt ICT services to meet their objectives, and these ICTs act as an incentive for customers to change their negative responses and encourage them to use technology (Ferguson 2000). For example, in the past, customers often incur large costs in the process of searching for their requirements and lose a lot of time when discussing with negotiators to attain discounts on goods.

More recently, banks have attempted to find a higher level of management and collaboration with customers through technologies which have the potential for a
wider reach of interaction with customers because customers can manage their orders online (Yin 2002). Furthermore, banking services often provide requirement forecasts based on the precision of the information about their services then attempt to gain customers’ feedback (create questions and receive answers), which helps banks to make modifications to their products using ICT, dynamically, in the right time frame.

The relationship between technology operation and banks’ process redesign has long been familiar. For example, prior research on ICT adoption has shown that the biggest potential of ICT to improve the performance of the adopter can only be fully realized by combining changes in business processes, because online transactions and relationships with bankers can reduce the level of uncertainty and enable banks to react quickly to environmental changes. The realization of perceived benefits depends on aligning supplier processes and incentives to enable suppliers to participate in online relationships and to share information between banks and customers. As a result, the banks must put in place a clear provider selection strategy that provides incentives to the right suppliers to participate in online information sharing (Yin 2002, Wang et al. 2008).

Elalagg (2003) found that banks that use techniques like the Internet achieve an increased number of customers. Similarly, a study by Dabholkar (1996) found that customers’ attitudes towards using technology have a positive influence on service experiences and interactions with employees. Most customers are likely to have been exposed to some technological services elsewhere, such as mobile and the Internet. The Internet and mobile technologies allow wider reach and richer interactions with customers, which were severely limited in the past due to more expensive, limited functionality, and proprietary technologies.

Customers can currently look for product information on claims, customize products, and manage orders online. Such capabilities are widely quoted as some of the reasons for improved performance of successful Internet enabled businesses. The extent to which banks provide each of these capabilities online has an impact on the customer-side level of interaction and value. When the capabilities are limited, customers may incur substantial costs, searching for the right information online and then resorting to traditional methods of expensive face-to-face or mobile
interactions that add substantial costs to the bank, while possibly diminishing customer satisfaction (Yin 2002). Therefore, banks’ relationships with their customers rely on transactional processes for information sharing (quality, relationship management), goods and services. In fact, that process of delivering strategic ICTs to customers requires suitable processes and incentives compatible with customers’ abilities. ICT reduces costs and risks linked with doing business, and creates barriers to competition (Aterido et al. 2009).

2.4.1 ICT and Collaboration

ICT has been used for several collaboration initiatives to integrate activities from ICT and the process of banking services (selling and buying). Past research shows clearly that activities of the 4Ps (product, price, promotion, place) of banks’ goals are used to improve relationships with customers through the adoption of collaboration strategies (Chen et al. 2007). Collaboration usually occurs when banks drive products and services to customers using ICT, because it offers high value and lower prices for service delivery. In such cases, customers are looking to join in collaboration with banks and to feel they are in a more competitive position through ICT adoption (Elgahwash 2006). Nucciarelli and Gastaldi (2008) suggested that collaboration arises from sharing both strategic and operational ICT in the long term to make a value chain without any limitation for both banks and customers because collaboration between them helps generate competitive advantage.

Collaboration between banks and customers is possible when suppliers provide new and additional solutions to solve customers’ problems and address their needs. This is usually as a result of understanding expectations of individuals and assists in closing sales with existing customers. In fact, these solutions, which are offered from banks, are the main elements noted in customers’ satisfaction feedback that result from relationships among banks and customers. This process depends on repeated transaction processes (knowledge resources, services, goods) between customers and banks to build the best relationships (Forman et al. 2007).

Banks often believe that ICT is important to provide a great deal of the solution and drive customers’ decisions towards services based on their goals. Banks can gain from ICT collaboration when they streamline their systems (including transaction
systems and strategic management) by aligning the ICT strategic plan and the bank’s strategic plan (Wells et al. 1999, Toole 2003, Phan and Vogel 2010).

Smith’s (1999) study established the importance of ICT to banks, confirming that banks should take advantage of opportunities provided by ICT, which in turn may lead to better bank profits. Furthermore, several studies suggest that ICT provides a new approach to understanding the shift of market dynamics for banking services and it establishes a strong foundation for the 4Ps by obtaining customers and modifying the services previously offered face-to-face (Leek et al. 2003). Relatively recent implementations of new technology such as ATMs, Internet- and m-banking by a few banks in Libya to service customers 24 hours a day, seven days per week are one example of ICT providing methods to enhance customers’ relationship with banks, bypassing traditional control rules in the market process (Brynjolfsson and Hitt 2000).

2.4.2 ICT and the Relationship Interaction Process

ICT plays a role in the banking sector by acting as a quality delivery method for services and products that solve customers’ problems and increasing interaction rates between them in the long term (Forman et al. 2007). Interaction reflects a relationship that has progressed to a more advanced stage; it usually comes after customers evaluate unique attributes for which they have received goods and services a few times (Forman et al. 2007). Elalagg (2003) identified that interaction more often occurs when banks supply real information to customers and accept their feedback, then give real answers for customers’ questions via a reliable communication channel following the right strategy to attract new customers.

Providers and customers in banks essentially interact through relational exchanges with ongoing interactions of several transactions in the short term. In these instances, interaction between customers and bankers will reduce cost, time and energy in understanding each other in the relational exchange. Moreover, banks will be encouraged to build communication using technological skills, more facilities and knowledge to take advantage of and enhance relationships long term with a suitable level of interaction for both parties (Mirani 2006). Therefore, the interaction process of ICT is significant for both banks (improved performance and
profit) and customers, because it has positive relationships and it maintains business value for them (Elalagg 2003, Shin 2004).

2.4.3 ICT and Self-Service

This section reports on self-service customer relationship systems in banks. Self-service has evolved over time in the banking sector. Self-service technologies are technological interfaces that facilitate customers creating and/or conducting a service, independent of direct service employee involvement. The self-service concept is simple for customers, as it allows them to perform tasks that were once done for them by others (Sannes 2001, Salomann et al. 2006, Banerjee 2009). Self-service technologies are ideal for banks because information processing is essential to their service delivery, and self-services are expected to reduce the need for financial intermediaries (Sannes 2001).

ICT-enabled self-service requires end-users to manipulate the system entirely and directly, with no help from an intermediary. The focus of this study is on the self-service technology that supports the banking sector to create greater relationships with most customers, particularly in Libya (Gemes et al. 2007, Travica 2008). The more recent self-service technology research has been well grounded in theory drawn from customer decision making and choice models based on the ICT process (Rose 2007). The use of technology in the delivery of services holds great promise for future simplification for both banks and customers in the area of self-service (Simon and Usunier 2007).

Self-service technologies can be considered as a replacement to a branch transaction, yet there is the issue of complementary services, which may be difficult to implement effectively when interaction is spread across self-service and face-to-face channels or when customers engage entirely in self-service without a full understanding of the available options (Rajagopal and Rajagopal 2007). Most banks offer self-service banking; however the scale and scope differs. Banks are accepting that technologies allow services to be delivered at low cost and to larger volumes of customers. For example, Amtrak company introduced telephone self-service by means of the Interactive Voice Response system that allowed cost savings of $13 million (Salomann et al. 2006). Furthermore, the combination of ICT and self-
service has the potential to decreases the cost of processing and transmitting information. Self-service technologies in banking, such as m-banking, are used to transfer money at point of sale and to exchange information (Sannes 2001).

ICT has become one key type of self service, and the Internet is an example of a driving force that enables customers to become intimately involved in customer services (Yang 2001). Technology progress has enabled Internet banking to deliver customers a faster and more convenient approach to handling their banking affairs from their home or office. As a consequence, Internet banking has created a new area of interest in the field of customer relationship research (Rose 2007).

The information a customer needs to engage in self-service banking will depend on their knowledge and experience with banking self-service technologies. A successful relationship using self-service technology requires positive customer experiences; these may arise due to convenience, satisfaction and loyalty (Sannes 2001, Rose 2007, Yu and Guo 2008). Offering technology-based self-services, whether on- or off-site, can result in significant cost savings for banks as well (Salomann et al. 2006, Simon and Usunier 2007).

Salomann et al. (2006) has compared the following three self-service technologies: automated teller machine (ATM), telephone banking and online banking. Their research provides evidence that a variety of different factors influence attitudes toward each of these technologies. Prior research has also suggested that customers benefit by new experiences of using ICT in their banking transactions because they have a positive feelings about ICT and they believe that ICT allows to them to use banks’ services without direct contact with banks (Sannes 2001, Eriksson and Nilsson 2007, Rose 2007, Travica 2008).

Self-service technologies in customer relationships are becoming increasingly important development that has been enhanced by customers’ increasing and diverse use of the technologies (Salomann et al. 2006). Rajagopal and Rajagopal (2007) suggested that ICT-enabled self-service includes three main elements that positively influence acceptance and support the positive relationship process between customers and banks; these are trust, quality and time.
The reason that technology-based self-service has been divided into the three broad categories of transactions, customer service and self-help is because in banking, direct transactions in self-service may include payments, loans and online trading services. Customer self-services may include functions such as online balance statements and the ability to change personal information (Sannes 2001).

There are several key self-service technologies that have affected the traditional face-to-face delivery of banking services (Travica 2008), with the distinction being that self-service allows customers to be their own problem solvers (Sannes 2001).

When reasons for engaging in self-service were explored with regular users, users were found to be more likely to perceive the self-service option to be more reliable, to provide greater control, to be easier to use, to offer greater enjoyment, to help avoid contact with employees and, under crowded conditions, to be a faster option (Rose and Fogarty 2006, Rose 2007).

Self-service technologies play a large role in making it possible for customers to achieve service delivery themselves. Adoption requires customers to modify their behaviour (McPhail et al. 2003, McPhail and Fogarty 2004) as well as positive customer experiences using ICT generally (Sannes 2001). It is important for banks to discover and understand the ability and willingness of customers to use technologies before broadly implementing self-service options.

In order for self-service to be successfully integrated into banking operations, banks must integrate their self-service activities with traditional customer services to create balance across modern technology interfaces and high contact customer relationships (Salomann et al. 2006). In short, self-service technologies in which customers co-produce a service with banks facilitated by ICT have become an increasingly critical component of services marketing. Thus, it is important for providers of self-service technologies to understand how customers evaluate, so that banks can improve their performance towards customers (Vogel 2005).

2.4.4 ICT and Service Quality

This section reports on the service quality in the banking sector of Libya. Service quality is an important element for banks in creating relationships with groups of
customers. The issue of quality management within banking services has drawn considerable attention over the past few years. The move to managed service has increased demands for outcome-based accountability, cost containment and attention to customer-focused quality, in order to remain competitive in a rapidly changing environment (Al-Fawzan 2005). Addressing the issue of services quality is critical for banks. Typical customer involvement and interaction with their bank is characterized by frequent contact that can occur as frequently as daily. Due to this frequency, service quality assumes considerable significance for the customer and for the bank (Spears 2004).

Service quality is an important concept for both customers and providers in the banking sector, so customers usually look for high quality services. Service providers hope that quality services will enhance their image, sales and profitability (Dabholkar 1996). Nowadays, service quality is a widely used program in the banking industry. It can be defined in many different ways from the viewpoint of the customer. Service quality can be defined as economic activities that create value and positive benefits for customers at specific times and place as result of bringing about a desired change in, or on the behalf of, the recipient of the services (Wei 2009, Sadek et al. 2010). An alternative definition is that service quality is the difference between the dimensions in customers’ perceived service and opportunity of service (Wei 2009). If banks provide services of poor quality, they will not be able to perform their work effectively. Moreover, as products and customer services within the banking industry become more similar and substitutable, switching costs become lower and more affordable for customers (Vogel 2005, Wei 2009).

Service quality is an intangible commodity that IT offers to customers through its activities and advantages (Spears 2004, Rappa and Islam 2006). It is not a physical entity, and is difficult to store. In addition, interrelation can be difficult, to the extent that it is difficult to separate any service person, as there is a high degree of interdependence between the service provider and the customer service staff member. In Libya, the quality of service has been given low focus by bankers. Few local banks still provide good service; for example, in Libyan banks each transaction takes a long time, creating long queues (Sadek et al. 2010). The importance of service quality in the banking sector is now increasing because of
customers’ expectations and perceptions of what constitutes good quality service (Spears 2004).

Service quality is a relative concept, linked on the one hand to the ability of the product to satisfy the requests of the customer. The increasing focus on quality has enhanced banks’ ability to produce goods or provide services that are able to meet the needs of customers. Service quality is also linked to the ability to achieve the wishes of the customers in a form that corresponds with their expectations and achieves complete satisfaction with the product (Elgahwash 2006, Petridou et al. 2007).

The growth in Internet-based services has changed the way that banks and customers interact. E-service is conceptualized as an interactive information service that provides a means by which a bank can differentiate its service offerings and build a competitive advantage. Key themes within the e-service quality literature include the dimensions and measurement of e-service, elements of the web experience and the relationship between the web-experience, trust, customer satisfaction, intention to purchase, and loyalty. This emphasis on the role of technological service facilitators contrasts to traditional service quality research, which emphasizes the human element of service delivery (Herington and Weaven 2007).

Customers often evaluate quality of service via groups of criteria. One common criterion is reliability, which means achievement in a manner that is what the customer wants (Spathis and Georgakopoulou 2007). The second common criterion is the speed of response when the customer needs help. It refers to the access a customer has to their bank to receive the required service in a given time (Petridou et al. 2007, Spathis and Georgakopoulou 2007). Customers are considered key for any business to survive; the ability of banks to deliver their products and services appropriately defines their success within the industry (Spears 2004, Toelle 2006).

Collectively, customers cannot easily articulate banking service quality, because the recipient of the service can only really assess their individual experience, thereby making its measurement more subjective than exact. Some literature describes service quality as a measure of how well the service level matches customers’
expectations (Al-Fawzan 2005). Hence, the measurement of banking service quality has to be based on perceived quality rather than objective quality because services are intangible, heterogeneous and their consumption and production occur simultaneously.

Despite its subjective nature, the literature has identified a list of determinants of service quality: access, communication, competence, courtesy, credibility, reliability, responsiveness, security, understanding and tangibles (Siddiqi 2010). E-service quality specifically, has seven dimensions for its evaluation have been identified in literature: information availability; ease of use; privacy and security; graphic style; reliability; efficiency; and fulfilment (Herington and Weaven 2007).

SERVQUAL has been used as one technique for exploring the most important service quality strengths and weaknesses in service providers. It uses five important elements: tangibles are the appearance of facilities, equipment, materials, and personnel; reliability is the performance of the service in a dependable and accurate manner; responsiveness is the willingness of staff to help customers and provide prompt service; assurance is the staff's ability to provide courteous and knowledgeable service; and empathy is the staff's ability to understand the needs of the customer (Yang 2001, Al-Fawzan 2005, Hou 2005).

In 2001 saw the establishment of a new scale called WEBQUAL (Oliveria 2007), with twelve dimensions: informational fit to task; interaction; trust; response time; design; intuitiveness; visual appeal; innovativeness; flow; integrated communication; business processes; and substitutability. This approach, however, seems more pertinent to interface design than to service quality measurement by customers.

In summary, in service industries particularly, the development of effective customer relationships is increasingly recognized as an essential component of relationship strategies. In most cases, the success of a service provider is dependent on high quality relationships with customers. Changes across the Libyan banking sector, the changes in technology use and rising customer expectations have all stimulated an active interest in managing customer relationships and, have resulted in a growing interest in customer retention in the banking sector (Al-Fawzan 2005).
Recently, Libyan banks have come to understand the importance of offering online services to their customers, to the point where such services are now an essential and inevitable convenience. Fortunately, online banking services do not represent merely an expense for banks. Thanks to such services, customers’ satisfaction levels rise while retention costs drop. In addition, online transaction costs are lower than all other channels combined (Mashat et al. 2005).

2.4.5 ICT and the Communication Process with Customers

The customer communication process is based around numerous main elements – source, message, receiver, translate process and sender (Berkowitz et al. 1992). Over the last decade, the significant development of ICT has recreated the way that banks operate their business and create new customer service channels (Sambamurthy and Parekh 2011). The communication process is completed through groups of tools helping to build interactive relationships with customers. ICT provides the greatest communication channels with interaction relationships (face to face) – they are fast and reduce the cost of this process (Leek et al. 2003). Moreover, ICT is changing the power balance in many relationships because communication with customers using ICT has challenged banks to take action to strongly integrate with customer groups (Toole 2003).

Communication technologies are becoming an integral part of the operation for many banks (Comm 2001), because ICT has been shown to be important in new businesses’ tools and with interaction with customers. The Internet provides many types of communication between customers and banks, including one-to-one or many-to-many, and local to global (Andersen et al. 2003, Yu and Guo 2008). Therefore, communication processes through technologies can occur between customers and banks’ employees in a setting that never closes (Harrison-Walker and Neeley 2004). This allows banks to introduce customer services on a new communication platform, and lets customers’ access services through a desktop computer or a handheld mobile device. Internet and mobile phone integration is increasing rapidly in banks because they have external communication capabilities and are capable of attracting new customers (Comm 2001).
2.4.6 ICT and Competitive Advantage

Strong competition in today’s business environment has resulted in a greater need for banks to build closer relationships with customers. These relationships must involve high quality interaction among banks and customer relationships to deliver the needed competitive advantage in the long term. Competitive advantage usually occurs when banks build long term customer relationships that can leverage information about specific customers to better understand their requirements and serve them. Some banks are able to become close enough to customers to suitably judge and serve their needs more effectively; customers join with banks with which they enjoy a good relationship (Ndubisi 2007).

ICT has provided unique advantages in many respects for both customers and banks (Comm 2001). Many studies have confirmed that competitive advantage is sustained by adopting ICT. Ray (2000) claimed that “Maintaining committed customer relationships have emerged as a sustainable competitive advantage”. Competitive advantage has importance as it influences and builds great value for both banks and customers. Beccalli (2007) reported a similar finding that the definition of the competitive advantage stems from different organizational dynamic abilities arising from the successful use of ICT. This results in such things as timely responsiveness, flexible product improvement and enhanced management capabilities (Vogel 2005, Nucciarelli and Gastaldi 2008), which has a positive effect on banks’ capabilities. This, in turn, creates improved competitive advantage.

The ICT revolution is increasing the expectations of customers and banks; banks must therefore be flexible and take more advantage of opportunities presented by ICT (Smith 1999). Phan’s (2010) definition of competitive advantage included the resources, capabilities, competencies, assets and processes that supply banking services with a distinct attraction to its customers and unique advantage over its competitors. In this definition, activities are used to attract and maintain customers. Competitive advantage activities include: banks providing services to customers at the lowest cost in the shortest time; value adding to create a service that offers highly desirable and distinct quality; speed that permits operational processes to be executed in a faster and superior manner; speed that permits banks to adapt to changing requirements of the market and being quicker than competitors; banks
having continuous flow of creative services, which is valued by the customer; and
customer service that has superior responsiveness to customers. These activities
should work together to create competitive advantages above and beyond activities
that will positively reflect banking services to increase successful ICT operation
(Ray 2000).

The literature has also identified that ICT has many advantages for banks. The key
benefits of ICT are that it can increase sales return through delivery of high quality
of services for customers, so that it completes the process by strong strategies that
service customers’ long term needs, and that ICT delivers greater control of
operations, which directs customers with full knowledge around the services or
needs of banks. These elements enhances a bank’s position and value, resulting
from a superior execution of ICT strategy (Phan and Vogel 2010).

ICT has a demonstrated ability to deliver intended improvements in business
environments, and banking specifically, as a result of ICT (Sambamurthy and
Parekh 2011). In short, ICT allows banks to gain a competitive edge because ICT
adoption is a strategy to address competition (Cavusoglu 2003). Successful banks
have invested heavily in ICT, focusing on competitive advantage and collaboration
processes with customers in different areas (Phan and Vogel 2010).

2.4.7 Trust

Trust is an important dimension in many transactional relationships; it is the
willingness to rely on the information given by a bank is accurate and secure when
a transaction is occurring. Trust when conceptualized as a dimension of the
technology acceptance model, has been identified as having influence on user
willingness to engage in online exchanges of money and / or sensitive information
(Kassim and Abdullah 2010).

Trust may be especially significant in banks based on positive expectation and
cognitive process. Furthermore, it is the integrating force that welds individual
actors together (Nakata and Zhu 2006).

Palvia (2009) reported that trust is a method used between a customer and their
bank and it is impacted by whether customer expectations are satisfied or
successfully transacted (Wamalwa 2006). Customers share personal and sensitive information with banks only when they trust aspects of the website. Integrity and capability are therefore important in establishing trust. Banks’ websites develop long-term relationships with customer from trust, and relational exchange, and integrate with them via ICT. Trust appears to have a double effect on the exchange relationship, directly as well as indirectly, through its effect on attitude, including satisfaction, value, loyalty, and through word of mouth.

Customers use banks’ sites to develop value and satisfaction, with value being important in the development of loyalty. Requirements can be identified and extracted from online customer interactions, reduce researching and searching costs for customers. As a result, ICT has huge potential for banks, which aim to access the positions of customers and understand their requirements (Wyner 1998).

Study by Ndubisi (2007), found that the trust and commitment support the ability of banks and help to them to establish the quality of the bank-customer relationship. When banks behave with integrity, this shows commitment and trustworthiness, as well as enhancing banks’ customer relationships. Trust is the key driver of relationship quality. Managers and providers of banking services should understand this in their efforts to build quality relationships with customers and to manage customer relationships more effectively.

Banking information is highly sensitive and requires significant trust between bankers and customers; the extent of trust may decide the level of precision of the information exchanged. ICT allows customers to maintain a connection with their banking operations by using applications for information exchange; these are also integrated with banks’ relationship management processes to facilitate building closer relationships with buyers (Yin 2002).

**2.4.8 ICT Integration**

ICT integration can occur at many levels, including functional integration and physical integration of staff resources to ensure interoperability in order to provide strong interaction with customers (Eichorn 2004). Integration involves the logical arrangement and linking of goals, objectives and strategies across complete processes, which in turn, allow communication with customers using ICT. ICT
integration involves managing the framework of people, tools and relationships within banks to enable consistent, coordinated progress in leveraging information and technology assets to facilitate effective business processes with customers and gain competitive advantage (Eichorn 2004).

Knowledge of the internal system, through web sites and the readiness of business units across operations, is required to achieve complete integration online with customers in downstream processes (Yin 2002). Consequently, perfect integration enables users to find increased visibility of facilities (Nucciarelli and Gastaldi 2008). System integration refers to the level to which banks integrate existing ICT systems and applications. It allows the flexible sharing information online between customers and providers in real time, because system integration enables firms to reply, innovate and make continuous improvements by identifying and sharing information across products / services / business units that enhance banks’ knowledge (Yin 2002).

2.5 Summary

The ICT revolution has the ability to change bank structures and creates high competition with the banking sectors (Toole 2003). As a result, many ICTs (such as computers, ATMs, networks and mobile phones) are being integrated into regular banking channels. The purpose of ICT is to provide more facilities, enhance exchange processes among banks and customers, and manage information (Rivard 2000). These activities are important because they impact on the ability of banks to growth and achieve value for their stakeholders (Nichter and Goldmark 2009). ICT helps banks because it reduces transaction costs and enhances customer experiences (Nakata and Zhu 2006).

Banks are able to develop unique customer relationships using ICT. These relationships require strategies, communication and resources. The elements (strategies, communication and resources) are rich exchanges linked through business processes and products, adding extra value to customers’ relationships when using ICT (Toole 2003). Finally, there are significant positive relationships between trust, quality and satisfaction, loyalty of customers and interaction of communication, which help banks to use ICT and create strong foundations with
customers’ requirements in real time (Elgahwash 2006). The following section will consider these issues in the Libyan context.

2.6 Libya

This section discusses ongoing ICT developments in Libya and highlights the role of ICT in creating better customer relations and supporting relationships within Libyan banks (Mulligan and Gordon 2002). There is limited existing research about the role of ICT in creating more positive customer relationships in the Libyan banking sector (Twati and Gammack 2006). The review of the literature presented here highlights the extent to which banks interconnect with other forms of customer cooperation (Britton 2006). From a review of the literature, it is evident that there are few relevant studies of Libya. There is only limited research relating to developing countries more broadly; as a group, they face different issues to developed countries. Due to the limited literature in the area, this thesis has reviewed the literature from other developing countries and from developed countries. On the basis of this review, this research has been able to identify technological issues in the Libyan banking sector (Twati and Gammack 2006, Ahmed et al. 2007, Dutta and Coury 2009).

This section seeks recommendations for further development in the Libyan banking sector as a result of applications of ICT; this is the biggest concern in many developing countries. ICT has and is continuing to transform the way banks deliver their services for customers. Despite this transformation, progress is slow in developing countries like Libya. This section discusses the issues raised by the application of ICTs in the banking industry in developing countries (Twati and Gammack 2006, Ahmed et al. 2007, Dutta and Coury 2009). It also presents background information about Libyan banks, the Libyan economy and the level of ICT in Libya, which informs the reader, understands the important role of ICT in creating more positive customer relationships in this banking sector.

In most developed countries, technology is a central element for addressing challenges in the modern banking business (for example, lowering costs and enabling efficiency improvements). The development of banking sector facilities is essential for Libya’s economic reform and, as a result, banking system assets are
equal to about 60% of GDP, suggesting considerable potential for growth in the banking sector and investment in ICT programs (Twati 2008, European Commission DG Trade 2009). Despite the opportunities afforded by ICT, Libyan banks are still using manual banking system techniques. Technology has not yet been adopted in most of the Libyan banking sector. The banks in Libya are the single most important supplier of financing for most companies and individuals, and the continued importance of banks as a source of capital for most companies also gives these organizations a crucial role in shaping the country’s economy (Britton 2006, Twati 2007).

2.6.1 History

Libya's history dates back millions of years. About 90,000 years ago, Libya was taken by an exceptionally inventive and advanced group of Palaeolithic hunters, and at the time was far more advanced than other civilizations, tribes or groups known to have existed. Around 40,000 years ago, Libya was occupied by the large-brained Cro-Magnon – the direct ancestors of the Berbers and the Iberians. Cultural evidence from southern Libya, particularly from Fezzan, the home of the classical Kingdom, dates back more than 30,000 years. Around 12,000 years ago, heavy rainfalls slowly turned the Sahara to lush-green land once more, and consequently, a number of civilizations flourished in the area, leaving behind rich representations of what life once was. The breathtaking treasures of the Sahara's prehistoric drawings and engravings are perhaps the best measure for the level of civilization attained by these advanced people (African Economic Outlook 2008, Blanchard 2008).

2.6.2 Geography

Of the Arab countries located in the north central part of Africa, Libya is one of the most economically developed. It was the African gate through which early human civilizations found their way to Egypt, the Middle East, Asia and Europe. Libya's strategic location was equally responsible for the successive waves of invasions throughout history, from the arrival of the Phoenicians down to Hitler's attack on Tobruk. Libya has many neighbours, mostly Arabic countries, as result of its location. Libya borders the Mediterranean Sea to the north, and shares borders with
Egypt (to the east), Sudan (to the southeast), Chad and Niger (to the south), and Algeria and Tunisia (to the west) (Shareia 2006, Organization for Economic Co-operation and Development 2008). Libya covers a large geographic area of about 1,759,540 square kilometres and has about 2000 kilometres of sand beaches with clear water and pure hot sunshine. It is the fourth largest country in North Africa and has the largest desert in Africa (Library of Congress 2005, Twati and Gammack 2006, IHS Global Insight Inc. 2009).

Libya plays an important role in North Africa because it holds the Mediterranean coast which is a link between European countries and most African countries (particularly the Arabic countries). Traditionally, Libya has encouraged visitors that have come to trade goods and services in Libya and the related investments (African Economic Outlook 2008).

2.6.3 Population

Libya is a large country with only a small population. It has an annual growth rate of 2%. Roughly 33% of the population is estimated to be under age 15. Nearly 88% of the population is urban and is concentrated along the northern coast (Library of Congress 2005, IHS Global Insight Inc. 2009, International Monetary Fund 2009).

In 2005, the approximate population was roughly 6.1 million, giving the country an overall population density of 3.20 persons per sq. km (Library of Congress 2005). The population of Libya increased to approximately 6,457,815 in 2012 after Libyan revolution in 2011. This is because of an increased number of foreign workers and investors in most Libyan sectors. Roughly 17% of the current population consisted of foreign workers and their families (Deloitte 2013).

The urban areas (coastal cities) are home to 86% of the population, while 14% still live in the countryside. More than two-thirds of people live in the more densely established coastal regions (Library of Congress 2005). The port cities of Tripoli and Benghazi are the two largest urban areas in Libya. Tripoli’s population according to the 2005 estimate was 911,643 and the population increased 997,065 in year 2012-2013. Although the population of Benghazi is approximation 685,360; Misurata 511,628; Al-Zawia 270,751 in similar period (IHS Global Insight Inc. 2009, Yahia and Ismail 2013).
The country has a literacy rate of 83% (IHS Global Insight Inc. 2009). Education is compulsory between the ages of 6 and 15, with schools having a 90% attendance rate (Twati and Gammack 2006, IHS Global Insight Inc. 2009).

The Libyan social environment is characterised by the extended family, clan, tribe, village, Arabic language and Islamic religion. These factors play a major role in the community’s life and people’s relationships (Shareia 2006, Al-Mabrouk and Soar 2009).

2.6.4 Economy and Currency

Libya suffered from serious economic conditions and required foreign help until an economic boom due to the discovery oil in 1959; this helped move Libya from a poor to a rich country (Shareia 2006). Until 1959, the Libyan economy was weak and dependent mainly on agriculture, animal husbandry, fishing and trade. Natural resources, such as oil and gas, led to a transformation of Libya’s economy from subsistence farming to a developed economy. This transformation changed the country from a poor to a rich country rapidly, and it has been in the top twelve positions among petroleum producers since 1991 (Yousef 2005, Twati and Gammack 2006, African Economic Outlook 2008, Al-Mabrouk and Soar 2009).

An economy is the realised system of human activities related to the production, distribution, exchange, and consumption of goods and services of a country. Thus, the composition of a given economy is inseparable from the technological revolution (African Economic Outlook 2008).

The Libyan economy, one of the richest in Africa and is largely fuelled by oil. Libya has one of the highest GDPs per person in Africa. The manufacturing power of Libya accounts for nearly 21% of GDP, primarily from agricultural products, iron, and petrochemicals (Organization for Economic Co-operation and Development 2008, European Commission DG Trade 2009). Libya has a powerful social security system, and provides housing, health services and education to all Libyans. Recent economic reforms have brought major changes to the Libyan economic system, including inviting international investors and foreign banks to invest in Libya (Lind et al. 2004, Organization for Economic Co-operation and Development 2008, Yahia and Saleh 2008, European Commission DG Trade 2009).
The oil sector has contributed to high growth in many sectors (Shareia 2006, Al-Mabrouk and Soar 2009). The Libyan economy is dominated by oil and related industries, which together account for 97% of export earnings, 75% of government receipts and 54% of the gross domestic product (Shareia 2006, Al-Mabrouk and Soar 2009). Agriculture is the second largest industry (Kridan 2006). The Libyan government is now gradually trying to encourage the development of a free market to diversify the economy and stimulate growth. Therefore, the economy of Libya is characterized by a high degree of interdependence with the rest of the world, particularly in the field of trade exchange. As such, the country is heavily reliant on the export of crude oil as the main source of foreign exchange and earnings (Yousef 2005, Shareia 2006, Twati and Gammack 2006).

Libya’s very high growth rate proved unsustainable in the face of the global oil recession and international sanctions. Consequently, the GDP per capita shrank by 40% in the 1980s. Successful diversification and integration into the international community helped current GDP per capita reduce further deterioration to just 3.2% in the 1990s. Libyan GDP per capita was about $40 in the early 1950s and it rose to $1,018 by 1967. In 1966 alone, per capita GDP rose by 42%. Currently, Libya is a member of the Organization for Petroleum Exporting Countries (OPEC), and is the world’s eleventh largest oil producer and is strategically well placed to take advantage of the Mediterranean and European markets. This confirms that Libya possesses a significant North Africa economic standing (Mashat et al. 2005).

The economy of Libya was traditionally based on policies of central control of the banking sector. Since 1993, Libya has played a vital role in diversifying its economy, especially in the banking sector, such that it has created new opportunities to provide different types of services to local customers (Shareia 2006). Libyan policy shifts highlight the need for Libya to attract foreign investment in order to grow its economy. Libya’s move from a socialist economy to a more market-driven one is expected to continue slowly. The economy remains constrained by structural rigidities and the legacy of damage from many years ago of moves towards privatization and other reforms. Improvements are likely to move at a slow pace, as the government looks to reduce its role in the economy and to increase support of the private sectors. The regulations of private sectors, such as
banks, are important keys for economic activities, so this shift was partly caused by the heavy fall of international oil prices. For example, Libya’s long era of isolation as a pariah state resulted in the stagnation of its economy and the degradation of its oil industry (African Economic Outlook 2008).

On the other hand, the main objective of economic development plans in Libya is to diversify the local economy and to find other sources of income rather than in the oil sector. This may lead to advantages, such as growth in the non-oil sector, especially the banking sector. Indeed, this objective is playing a vital and crucial role in the economic development process as a means of sustaining the country’s economic development plans (Library of Congress 2005, Yousef 2005, Organization for Economic Co-operation and Development 2008).

2.6.5 Communications

Communication programs are used a component of the connection process with both customers and non-customers; bank services rely on the new communication platforms to maintain their position in the market (Elgahwash 2006). Computers, the Internet and mobile phones generally assist the process of communication. In the banking sector, the Internet and mobile phone technology are expected to provide new ways to improve customer service and diversify banking services (Yu and Guo 2008).

Libyan Telecom Technology (LTT) was the first Libyan company to work in the field of ICT (Twati 2008). LTT is involved in making logical programs to develop projects in the field of communications and ICT (Al-Mabrouk and Soar 2009). These programs cover areas such as the use of the Internet, which was introduced to Libya in late 1998; initially, only people from the authorities were able to gain access to the Internet (Hunaiti et al. 2009). The telecommunications system has been modernized since the launch of LTT and it now offers high quality services to people in most parts of Libya (Twati 2008, Hunaiti et al. 2009). Recently, Libya has attracted more than 500 companies in the technology industry, and particularly ICTs (Internet and mobile phone), from different developed countries. They have gone to Libya with a view to create the best technology in the region as a result of
the ICT revolution, which has impacted directly or indirectly on almost all aspects of life (Al-Mabrouk and Soar 2009).

Libya’s telecommunication network consisted of approximately 380,000 connected telephone lines in early 1996, reflecting a telephone density of 6.79 lines per hundred people. This had increased to approximately 750,000 telephone lines and 100,000 mobile cellular phones in 2003 (Library of Congress 2005, International Monetary Fund 2006, Twati 2008, International Monetary Fund 2009). In 2004, estimates reported that Libya’s fixed lines decreased to about 700,000, while mobile subscribers increased to about 150,000. These figures represent less than 13 percent and 3 percent of the population respectively (Library of Congress 2005). While mobile cellular telephone systems became operational in 1996, they had limited access and coverage. Until the last few years, these services covered only certain areas of Libya (Twati 2008). Libya’s modern telecommunications system is important as it determines the country’s ability to adopt and use technology. Without suitable telecommunications systems and good networks, effective and modern ICT usage will be very difficult to achieve.

In terms of telecommunications, Libya's first provision of Internet services started in 1998, through an experimental system. Telecommunications systems and Internet services in Libya are poorly developed and relatively expensive. The only company offering Internet service is the Libyan General Post and Telecommunication Company via existing telephone services. This one company is not able to provide complete services across Libya (Library of Congress 2005, Twati and Gammack 2006).

2.7 Libyan Banking Sector

The technological revolution in the banking sector began in the 1950s, well before it began in most other industries, with the first automated bookkeeping machines installed in a few US companies. Automation in banking became common over the following decade as bankers quickly realized that much of their labour-intensive, information-handling processes could be automated on the computer. A second revolution occurred in the 1970s with the advent of electronic payment technology (Ferguson 2000).
The primary purpose of banks is to act as a payment agent for customers, and to borrow and lend money; many other financial activities have also been added over time. Banks provide opportunities to borrow money by accepting funds deposited in current accounts and accepting term deposits. Moreover, banks provide almost all payment services and a bank account is considered indispensable by most businesses, individuals and government (African Economic Outlook 2008). The Libyan banking sector offers basic operations, including various services for customers such as keeping money safe, issuance of cheque-books, provision of loans, transfers of money and, providing a certified cheque guaranteed by the bank cashier (Libyan Central Bank 2005, Libyan Central Bank 2006).

In 1970, the Libyan regime nationalized all banks in Libya (Library of Congress 2005), because the banking sector was one of the important businesses in Libya. The sector has had a positive influence on the Libyan economy, contributing to its development and growth, since the establishment of the first bank “Umma bank” in 1907 (Chukumba et al. 2007, International Monetary Fund 2009). In late 2000, the banking sector in Libya reported a total profit of US$367million which was used to support the Libyan economy (Owens and Davies 2001).

According to the Libyan Central Bank Annual Report (2005) (Arabic Text), there are sixteen banks in Libya. They are: Gumhouriya Bank, National Commercial Bank, Sahara Bank, Wahda Bank, Mediterranean Bank, National Banking, Saving and Real Estate Investment Bank, Agricultural Bank, Development Bank, Libyan Foreign Bank, Alsaraya Bank, and Commerce & Development Bank. All of the public banks in Libya follow an old banking system in their interaction with customers, guiding them closely through all activities. In recent years, the government of Libya has become willing to diversify the economy by encouraging private sector development and investments in ICT and banking (Libyan Central Bank 2005). The banking sector now includes some private banks. Across the banking sector’s Up to 336 branches, there is capital of over Libyan Dinar (LD) 16,813,363,594 million. Despite the size and economic contribution of the sector, the Libyan government has traditionally ignored the benefits offered by the sector and as a result relies on annual oil earnings (Al-Hajri 2008).
Libya’s banking system was completely state-controlled during the 1980s and early 1990s. The Libyan authorities started to liberalise the national banking system in the mid-1990s by permitting private ownership of banks.

The privately owned Bank of Commerce and Development (BCD) started operations in Benghazi in 1996. The government has encouraged the private banking sector and it now includes banks such as BCD, Amman Bank, Tourist Bank, Africa Bank, and National Banking Corporation, which undertakes Ahlijah Bank’s clearing services and international activities. For example, Ahlijah Bank’s assets at end-2000 totalled LD 734M, equivalent to only 6% of Commercial Bank’s assets. Many private banks in Libya are small and not particularly successful, although some (such as Development Bank) are active.

It is only since 2001, with the liberalisation of foreign trade, that banks have experienced substantial changes. Private sector customers no longer have to work through the large state-owned monopolies, and the commercial banks themselves are free to develop banking relationships abroad. In 2001, they became connected to the Society for World-wide Interbank Financial Telecommunication (SWIFT) which meant they no longer needed to use the Libyan Arab Foreign Bank (LAFB) to make foreign payments (Kridan 2006).

More recently, the government of Libya introduced laws enabling more financial liberalisation and greater flexibility in the banking system, albeit in a cautious fashion, so this initiative has been very slow to take effect. Libyan Banks receive most of their funding (83%) from customer deposits and customers are now expecting greater power. The country’s banking system is undergoing a substantial modernization program to upgrade available services and deal with large numbers of non-customers so they can provide and facilitate the use of non-cash payment instruments (Libyan Central Bank 2005, Libyan Central Bank 2006, African Economic Outlook 2008, Libyan Bank of Commerce and Development 2008, Libyan Bank of Commerce and Development 2009).

2.7.1 The Central Bank of Libya

The Central Bank of Libya (CBL) was established in 1956 in the capital city of Libya, Tripoli. Its balance of financial assets at the end of 2007 was LD 106404.9
million (Libyan Central Bank 2007). CBL supervises the banking system and regulates credit and interest. It is 100% state owned and represents the monetary authority in Libya, enjoying the status of an autonomous corporate body. The law establishing the CBL stipulates that its objectives are to maintain monetary stability in Libya and to promote the sustained growth of the economy in accordance with the general economic policy of the state. It promotes improving performance and increasing revenues through the provision of services to customers (Gemes et al. 2007).

LCB owns (fully or with majority control) four banks: Jamahiriya Bank, Wahda Bank (87% ownership), Sahara Bank (82.7% ownership) and the National Commercial Bank. These banks hold almost 90% of Libya's banking sector assets and each has capital of at least 100 million Libyan Diners (International Monetary Fund 2006). The banking system that is directly under the control of LCB offers limited services for customers, such as loans, and these are usually made on the basis of personal connections rather than active strategy.

CBL’s headquarters is in Tripoli. It also has three branches located in Benghazi, Sebha and Sirte to make its services more accessible. Since the CBL’s establishment, its functions have grown. Its main functions can be described as ‘Issuing and Regulating the Currency’, and includes activities such as:-

1. Issuing and regulating banknotes and coins in Libya. The unit of currency in Libya is the Libyan Dinar. The CBL is the sole issuer of Libyan currency (banknotes and coins). Currency in circulation is backed by gold and foreign exchange in convertible currencies, as well as the foreign treasury bonds and Libyan treasury bonds of 15 years maturity (Kridan 2006).
2. Maintaining and stabilizing the Libyan currency internally and locally.
3. Maintaining and managing the official reserves of gold and foreign exchange. The CBL keeps and manages Libya’s gold and foreign exchange reserves. Thus, the Bank is responsible for selecting suitable investments and amounts to be invested in each currency, taking into consideration developments in foreign exchange, money and capital markets to ensure safety and profitability. The Bank allows commercial banks to keep foreign assets in accordance with regulations that it issues from time to time in

4. Regulating the quantity, quality and cost of credit to meet the requirements of economic growth and monetary stability.

5. Taking appropriate measures to deal with foreign or local economic and financial problems.

6. Acting as a banker to the commercial banks, the CBL keeps the legal cash reserves required from commercial banks as a percentage of their customers' deposits. In addition, it accepts interest-bearing term deposits from these banks. The CBL also acts as a lender of last resort for the commercial banks and can provide them with extraordinary loans in any critical exceptional circumstances it deems threatening to the monetary or banking stability of Libya (Kridan 2006).

7. Supervising commercial banks to ensure the soundness of their financial position and protection of the rights of depositors and shareholders.

8. Acting as a banker and fiscal agent to the state and public entities. The CBL is the fiscal agent for the state and, as such, it keeps the accounts of revenues and expenditures for general secretariats. It also disburses transfers and collects funds domestically and abroad, as well as administering letters of credit on behalf of its customers. These banking services are also offered to public institutions. Additionally, the CBL is charged with the management of public debt, consisting of treasury bills and treasury bonds, which it sells to, and buys from the licensed banks. It also pays out interest due on public debt. On behalf of the government, the Bank manages the state's subscriptions to regional and international institutions, and undertakes the management and execution of payments on agreements concluded between Libya and other countries (Kridan 2006).
The role of the CBL in economic development is manifested in its creation of monetary and banking institutions capable of mobilising and channelling savings for development projects. The Bank also contributes to strengthening the State’s financial position through managing the public debt as its holdings of gold and foreign exchange. Its indirect role in the economic development of Libya is embodied in its influence over the activities of commercial banks, especially by controlling the volume, direction and cost of credit. The other aspect of the Bank’s indirect role lies in the adoption of monetary policies capable of reinforcing internal and external confidence in the strength and stability of the Libyan currency and economy and consequently, encouraging savings by citizens and promoting incentives for the utilization of these savings in productive and safe investments, as well as attracting foreign investments and alleviating any causes for the national capital to be invested abroad (Libyan Central Bank 2005, Libyan Central Bank 2006, Libyan Central Bank 2007, Libyan Bank of Commerce and Development 2008, Libyan Central Bank 2008, Libyan Bank of Commerce and Development 2009).

### 2.7.2 Libyan Agricultural Bank

The Libyan Agricultural Bank is an agricultural development bank operating under special law and owned by the Libyan government. Established in 1957, it provides advice and guidance on agricultural problems, advances loans to agricultural cooperatives, and generally assists in developing Libya’s agricultural community. The Bank operates one city branch from its headquarters in Tripoli and another 54 branches throughout Libya. The Bank is also a member of the Near East-North Africa Regional Agricultural Credit Association (Libyan Central Bank 2005, Kridan 2006).

The bank provides in-kind and in-cash short-term, medium and long-term agricultural credit to individual farmers, agricultural cooperative societies and agricultural companies. Additionally, it mobilizes individual and group savings in rural areas. It cashes cheques issued by customers and provides guarantees to depositors or borrowers. The bank also subsidizes prices for various agricultural inputs and purchases crops at prices exceeding the prevailing market prices, reselling them to customers at reduced prices. Hundred percent of the Bank’s loan...
portfolio is allocated to the agricultural sector. The Agricultural Bank predates the revolutionary government by twelve years; it is a specialised bank that by 2005 had 36 branches (Kridan 2006, Libyan Central Bank 2006, Libyan Central Bank 2007).

2.7.3 Libyan Arab Foreign Bank

The Libyan Arab Foreign Bank (LAFB) was established in 1972 in Tripoli, Libya as the country's first offshore banking institution licensed to operate internationally. The bank is 100% owned by the Central Bank of Libya. The bank owns 26% of British Arab Commercial Bank, which is also an affiliate of HSBC Group. The Libyan Arab Foreign Bank (LAFB) encompasses a variety of services and operators facilitating international trade, money flows for investment and payment, and loans to government and official institutions as well as to the private sectors. Its value in the international markets is relatively concentrated on services, including insurance and confirmation of letters of credit, creation of acceptance credits, and supply of foreign exchange (Kridan 2006, Libyan Central Bank 2006, Libyan Central Bank 2007).

This Bank implements the international functions of the Central Bank, operating through subsidiaries or affiliates in about 30 foreign countries. It also makes investments outside Libya. It is engaged in financial and banking operations outside the country and acts as the foreign agent for the government and Libyan commercial banks. Its main purposes are to encourage regional development in Libya, to become active in international financial markets, and to serve as a vehicle for Libyan assistance to other countries (Kridan 2006, Libyan Central Bank 2008).

2.7.4 Gumhouria Bank

The Gumhouria bank was established on the 13th of November 1970 in accordance with banking Law No.1 of 1970, the bank was fully owned by the Central Bank of Libya. A state-owned bank and is the second biggest commerce bank in Libya (behind Libyan Foreign Bank), in terms of assets, revenues and deposits, as well as the number of branches and agencies in Libya (150 branches and agencies in total) (Gait 2009).

According to administration of Central Libyan Bank law No.74 (2007), No.8 (2008) and the Libyan Banking Sector law No.62; and with regards to the merger of two
banks (Gumhouria Bank & Umma Bank). Both banks were amalgamated into one bank, Gumhouria Bank, with capital of up to 11 billion Libyan Dinner, resulting in Umma bank being dissolved (Gumhouria Bank 2010).

This bank is of significance for the Libya economy; all the activities and systems of this bank are covered under the rules of the Central Libyan Bank. Gumhouria bank has directly had a positive role in local market based on its financial management in banking industry, financial support for customers, and customer services through 155 banks (branches and agency) throughout the entire country of Libya.

There are currently many challenges that have affected the banking industry within the local and international environment. The administration of Gumhouria bank has followed a new strategy to increase and maintain customers against their competition. That strategy relies on the delivery of diverse, high quality services with the possibility of receiving a competitive advantage. For current and future customers a suite of electronic services is available to increase customer satisfaction and loyalty (Gumhouria Bank 2010).

2.7.5 The National Commercial Bank

The National Commercial Bank was the first Saudi bank to be licensed, and is the biggest in the Saudi Arabian Kingdom and a leading financial institution in the Region. The National Commercial Bank owns 90.424% of NCB Capital, the Premier Investment bank in the Kingdom, and owns 64.68% of Turkiye Finans Katilim Bankasti (TFKB), the leading bank in Islamic banking in Turkey. The Bank was constituted as a General Partnership from its founding in 1953 until 1997, when it was reconstituted as a Joint Stock Company. In 1999, the government of Saudi Arabia acquired a majority holding in the Bank through the Ministry of Finance's Public Investment Fund (PIF). Over 89% of customer transactions were executed through alternative delivery channels during the 2010 fiscal year (Kridan 2006).

2.7.6 Wahda Bank

Most Head Office functions of the Wahda Bank are conducted in Benghazi. It has an average sized network of 69 branches, serving most of the country. The Wahda Bank was formed in 1970 to take over the Libyan operations of four foreign banks:
the Bank of North Africa SAL, Kafila Al-Ahly Bank, Nahda Arabia Bank, and Societe Africaine De Banque SAL. Due to some local ownership at the time of nationalisation, private shareholders currently own 21.7% of the equity that is not owned by the Central Bank. Consequently, Wahda Bank has been paying annual dividends as high as 30% (Kridan 2006).

2.7.7 Saving and Real Estate Investment Bank

This bank was established under the name ‘Manufacturing and Construction Bank’ in 1965. At the time, it comprised two branches with capital of 10M LD, with 5M LD for construction loans. In 1969 the capital increased to reach 45M LD. Due to the importance of mortgages and state loans in supporting the economy and social development in Libya, in 1980 the total capital rose to 100 million LD, divided into 10,000 shares each with a value of 10 LD. The amount of capital paid up to the year 2000 was 360,310,000 LD. The Bank's headquarters is in Tripoli with 27 branches throughout the country. The bank spans two industries which are very important to Libya's economic development, the banking and construction industries (Kridan 2006).

The Bank aims to support the progress of the construction industry in Libya through:

1. Offering construction loans and issuing debentures and certificate investments;
2. Implementing and managing construction projects for it and others;
3. Owning, constructing, and buying trust deeds of properties; and
4. Establishing and owning construction companies or participating in them.

2.7.8 Development Bank

This bank was established pursuant to Law number (8), legislated in 1981, to replace the Manufacturing Division of the Manufacturing and Construction Bank (now the Saving and Real Estate Investment Bank). It began operations in the same year, with a number of branches distributed throughout Libya; by the end of 2000, the bank had 23 branches. The Bank provides consultation and technical help, with
a particular focus on projects with direct or indirect funding from the bank, but also supports others without funding from the bank.

2.7.9 Sahara Bank

The Tripoli-based Sahara Bank has 39 branches, nearly half of which are located in the main cities of Tripoli and Benghazi. Before nationalisation, its owners were the Bank of America (29%) and Banco di Sicilia (20%), with Libyans holding the majority 51% (Kridan 2006).

2.8 Banking Technology Levels in Libya

As explained above, Libya has been slow to adopt technological developments which have been in place in other countries since as early as the 1950s (Ferguson 2000). Since 1998, Libyan banking services have been re-evaluating their adoption of ICTs (Twati 2008, Al-Mabrouk and Soar 2009, Hunaiti et al. 2009). Presently, this ICT revaluation covers most aspects of the Libyan banks’ operations, including banker and customer relationships in terms of accepting ICT. Libyan banks are attempting to meet the needs all stakeholders and provide access to services from customers’ positions in real time. These operations are targeted at creating reciprocal customer relationships in the long term (Tong et al. 2008). M-banking is started to be viewed as an integral part of banking activities due to its ability to provide a direct interface between banks and customers (Chung and Kwon 2009).

Banks now routinely allocate significant sums of money to adopt, implement, manage, and integrate information with organizational activities to provide better services. Central banks have also allocated billions of dollars to build infrastructure to support the reliable transfer and efficient management of information (Twati and Gammack 2006, Twati 2008). Libya’s economic progress is dependent on technology brought in from overseas, alongside the importation of the expertise needed for the expansion, upgrading and modernization of Libya’s infrastructure.

This is central to an ambitious multi-billion dollar national development plan, which had a US $14 billion allocation for 2007 alone, representing 60% of the total annual budget (European Commission DG Trade 2009). When the 17 February 2011 revolution occurred in Libya, the banking sector quickly moved to other
strategies. Libya banks needed to determine a new approach to avoid any future crises and reduce their costs. The restructure of banking sector after 17 February 2011, provides the opportunity for self-service technologies and how they can assist in the development of new techniques for banking. This change needs to occur with a focus on improving the position of the banking sector as well as, improving customer satisfaction and loyalty.

ICT is important as it supports national development, especially in developing countries. Libya, as a developing country, values the importance of ICT in improving its banking industry growth and development, and overall efficiency of its businesses. It has allocated substantial resources for ICT transfer and begun to build infrastructures to support a more reliable and faster adoption of ICT. The Libya government is pushing for more comprehensive ICT to take the country from a traditional economy to a modern one by a plan based on improving the private sector, especially in banking (Torchia 2009), believing that technologies are the main platform of opening the sector and all banking services to customers (Chukumba et al. 2007, Al-Mabrouk and Soar 2009, International Monetary Fund 2009).

Despite the government encouragement, many banks are failing to adequately capitalize on the enormous potential of the key growth channels online and using m-banking because they believe that these channels do not yet meet customer needs and expectations. There is a need for banks to pay greater attention to channel integration where this is relevant to customers, as few banks manage to achieve this (Gemes et al. 2007).

The development of Internet technology is continuing to change the way business is done. Clearly, Internet Banking is becoming one of the most important delivery channels of banking products or services. However, the provision of Internet Banking in itself is no longer sufficient for competitive advantage, it has become the threshold standard for the industry. Therefore, in response to global trends brought about by using the Internet, banks have to better understand their customers and respond quickly and strategically to market developments in customer centric ways (Yiu et al. 2007). Table 2.2 below shows figures of Internet users and population in Arabic region.
The Internet was introduced in Libya in 1999 with less than 1000 users mostly at that time government organisations (Al-Mabrouk and Soar 2009), and gradually, citizens were allowed access from early 2000 (Hunaiti et al. 2009). Internet users in Libya have been estimated at 954,275 users as at 30 June 2012 (Internet World Stats 2012) with 17% of the Libyan population using the Internet. This limited number of Internet users compared with other countries, could be an issue in increasing customer uptake of Internet banking for customers accessing their bank account.

The use of technology in Libya is at present minimal, despite it being one of the wealthiest countries in Africa. While developing countries are eager to adopt new information technologies, the process of adoption has been slow and the current use of ICT is far less than that achieved in developed countries (African Economic Outlook 2008, Twati 2008, Internet World Stats 2012). With customers being at the heart of most banking services, it is especially important for service providers like banks to introduce reliable processes and procedures for the interaction with their customers in order to serve their customers better, and hence build strong customer relationships (Nauck et al. 2006).

2.9 ICT Challenges in the Libyan Banking Sector

Banks face many operational barriers, including relationship process issues, related to the integration of ICT systems (Toole 2003). These challenges and their associated risks have led to poor growth and limited the scope of relationships. This thesis will seek to explain some of these issues, which have been reflected broadly across the banking sector and have significantly impacted on banks’ ability to create and maintain customer relationships. These issues are summarized below:
1. Internet use is expensive (one hour = one Libyan Dinar) for users. For example, there is a high cost in training employees to use ICT for customer services, even when the outcome is saving time and reducing costs (Comm 2001, Cavusoglu 2003). Consequently, banks regularly follow strategies based on reducing the cost of processes rather than increasing the value of these processes to the customers’ relationships (Toole 2003).

2. Libyan banks are often unable to leverage any competitive edge from their ICT investments because most employees are generalists and do not have the experience to service customers well, particularly when they require an additional element of ICT expertise (Ferguson 2000, Toole 2003). Inexperienced banking staff who provide ICT explanations to customers can create misunderstandings and confuse customers when they are attempting to learn to use new technologies (Comm 2001). More highly educated, professional customers with experience integrating relationship processes into business interactions (4Ps & 4Cs) are more likely to use ICT in banks than are older customers.

3. Some owners of banks believe that ICT is unnecessary in the banking sector, and hesitate to invest because technology is changing so fast (Comm 2001, Vogel 2005). It is complex to measure the impact and value of current ICT. It is particularly difficult to determine the changed quality of the banking sector due to modified behaviours of employees (inputs) and types of services provided directly to customers.

4. The biggest challenge in recent times facing the sector is how banks can achieve sustainable competitive advantage in the same sector using ICT, because all banks are now moving to use ICT in their relationship operations to connect with customers (Comm 2001, Cavusoglu 2003).

5. Overall, the use of ICT in developing countries such as Libya remains at a very low level compared to developed countries. In the developing world, 31% of the population is online, compared with 77% of population who are online in the developed world (International Telecommunications Union 2013). This is may result from enormous differences in access to telecommunications both
between and within developing countries. For instance, while in developing countries a considerable proportion and sometimes the majority of the population lives in rural areas, with over 80 percent of the main telephone lines are located in urban areas (Kartiwi 2006).

6. The weak ICT infrastructure in developing countries like Libya is a barrier to develop business relationships. A significant barrier is the lack of a uniform e-payment system. Moreover, credit cards are not common because of ICT infrastructure limitations and trust issues. Another concern is the costs of utilizing the Internet for businesses including subscription fees, cost of maintenance and time access costs (Twati and Gammack 2006, Thao and Swierczek 2008).

All of reasons above reduce the relative advantage of the Internet- and m-banking. As a result, many business customers have not been able to fully profit from the Internet technologies and, service dealers cannot develop better relationships with customers (Twati and Gammack 2006, Thao and Swierczek 2008).

Libyan banking system is moving to modernize its primitive banks but faces an uphill task in a commanding economy where cash is the accepted method of payment. The rapid move to modernize the country’s banking has been driven by the banking sector looking to foreign investors as laws have been relaxed in recent years (Liao et al. 2009).

Libyan banks have come to understand the importance of offering online services to their customers, to the point where such services are now an essential and inevitable convenience. Fortunately, online banking services do not represent merely an expense for banks, quite the contrary. Thanks to such services, customers’ satisfaction levels rise while retention costs drop. In addition, online transaction costs are lower than all other channels combined. To maximize returns on their investment, banks must now focus on expanding the current use of these services and encouraging new Internet users, who are less knowledgeable about technology, to subscribe (Hou 2005).

However, we believe that ICT has the potential to attract new customers and create positive relationships for Libyan banks. Self-service technologies (including
Internet & Mobile) can offer customers an enhanced range of services at very low cost. They can support relationship progression between banks and customers, and enhance convenience, privacy, acceptability, accessibility and affordability (Cracknell 2004).

In conclusion, the banks in general and Libyans banking sector in particular are advised to consider investment in ICT applications as the key to generating competitive advantage and maintaining their threatened domination of the market for banking services. In most economic sectors, organizations are encounter strong economic pressure for cost and time reduction. Nonetheless, competition is very intense, particularly in the banking sector, and in order to maintain their competitiveness, banks need to develop a stronger competitive edge through the implementation of ICT in customers’ services (Kridan 2006). Part of this change must include customer education – with an enhanced knowledge of ICT (as is common in other countries), customers of Libyan banks are likely to embrace its use for banking activities, such as the use of credit cards (such as Visa and MasterCard) and arranging personal loans (Gemes et al. 2007, Twati 2008).

2.10 Summary of the Libyan Banking Sector

Table 2.3, below summarises the Libyan banking sector, including details of the assets held by each bank and the number of branches. This table was developed from information obtained from Central Libyan bank, and from the Libyan banks’ websites where available.

<table>
<thead>
<tr>
<th>No</th>
<th>Bank name</th>
<th>Established</th>
<th>Branches</th>
<th>Average assets</th>
<th>Website of bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Elwhda Bank</td>
<td>1970</td>
<td>74</td>
<td>$108 M</td>
<td><a href="http://www.wahdabank.com">www.wahdabank.com</a></td>
</tr>
<tr>
<td></td>
<td>Bank Name</td>
<td>Year</td>
<td>Age</td>
<td>Capital (in M)</td>
<td>Website</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------</td>
<td>------</td>
<td>-----</td>
<td>---------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>9.</td>
<td>Amman Bank</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10.</td>
<td>Alwafa Bank</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td><a href="http://www.alwafabank.com">www.alwafabank.com</a></td>
</tr>
<tr>
<td>11.</td>
<td>National Banking Corporation</td>
<td>1992</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>12.</td>
<td>Development Bank</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>13.</td>
<td>Real Estate and Investment Bank</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td><a href="http://www.eddekhbarbank.com">www.eddekhbarbank.com</a></td>
</tr>
</tbody>
</table>

Most of the banks across the Libyan banking sector are attempting to provide excellent quality service in areas such as savings accounts and different types of loans. Overall, banks have improved their approach sharply in recent years and customer relationships have contributed to this achievement (Liao et al. 2009).

The development of the banking sector’s facilities is essential for Libya’s economic reform, as banking system assets are equal to about 60% of GDP, suggesting considerable potential for growth in the banking sector and investment in ICT programs (Twati 2008, European Commission DG Trade 2009). The Central Bank of Libya now depends on the benefits afforded by developing technology and improving bank activities delivered directly to customers (Hunaiti et al. 2009). For example, since 1993, some private banks in Libya have offered online banking services to reach the existing and prospective customers. As a result, identifying, acquiring and servicing bank customers changed forever. Commercial banks created online strategies and subsequently put money into the burgeoning opportunity of online banking. Online banking provided the opportunity to improve customer service, create operational efficiencies and extend the virtual reach beyond a physical location (Britton 2006, Organization for Economic Co-operation and Development 2008, Torchia 2009).

Given that the Libyan banking system operates within a developing country, it faces different challenges to developed countries. In most developed countries, technology is a central element for dealing with challenges in the modern banking
business, such as lowering costs and enabling efficiency improvements. Certainly, many banks worldwide are highly successful at using IT to provide efficient banking services to their customers. While banks in Libya have focused on differentiation on low cost (European Commission - Competition DG. 2006), some banks have achieved excellence in the local market through other means such as ICT. For example, the Commerce and Development Bank has benefited by serving their customers in a short amount of time through ICT. Clearly, some banks in Libya have tended to show a huge gulf between best practice and average performance (European Commission DG Trade 2009).

The technology revolution in the banking sector of Libya actually began in late 2000 (Ferguson 2000, Twati and Gammack 2006, Twati 2008, Hunaiti et al. 2009). However, the Libyan banking sector has been very slow to move from traditional channel banking services to electronic channels. The banking sector relies on a small number of ATMs, however online banking provides a wider range of services to a wider range of users. The number of Internet users in Libya was approximately 954,275 as at 30 June 2012 (Internet World Stats 2012).

Libyan banking still relies heavily on traditional channels, such as telephone banking, to deliver banking service for existing customers. (Telephone banking refers to any service provided by banks that allows customers to perform transactions over the phone (Mobile Marketing Association 2009). This is one of the many reasons banks have suffered from inefficient manual methods of banking, typically using less modern ICT than in many Western countries. Often only basic transactions are available to customers (for example, account balances and simple payroll systems). Customers still have to wait in line at a branch to cash a cheque from their accounts and they are required to maintain a chequebook, used only when cashing money from their bank (Nauck et al. 2006, Twati and Gammack 2006, Twati 2008).

In general, the banking services that are offered online by Libyan banks are the same as those (limited services) offered in branches. At the moment, only withdrawals cannot be performed online. However, leading Libyan banks now offer new online services, such as person-to-person, one-to-one money transfers. Some banks also provide for the receiving of transfers via contracts with foreign banking
institutions. For example, the Commerce and Development Bank has contracts with Western Union and Money Gram companies for international outgoing money transfers (Libyan Central Bank 2006, Libyan Central Bank 2007, Libyan Central Bank 2008).

Banking crises have developed many times throughout history when one or more risks materialize for a banking sector as a whole. Banks are susceptible to many forms of risk, which have triggered occasional systemic crises. Risks include liquidity risk, credit risk and interest rate risk (Grant 2011). Since the 2008-2009 fiscal year, the impact of the global financial crisis on Libya’s banking has seen a limited reduction in the sizeable current account and budget surpluses of recent years and this has had some effect on the banking sector. The limited impact was due to the lack of exposure of domestic banks to the global financial system. In addition, Libya's foreign assets consisted mainly of foreign reserves and the portfolio of the Libyan Investment Authority (LIA) (International Monetary Fund 2009).

The following section discusses the theoretical framework and hypothesis of this research, based on the review of the literature presented above.

2.11 Theoretical Framework and Hypothesis

2.11.1 Introduction

The previous chapter identified the changes and driving forces that have led to the emergence of electronic banking, with one of the most prominent factors being advances in information and communication technologies (ICTs). Identified positive outcomes of electronic banking include both improved business processes and enhanced customer relationships. Most Libyan banks have now come to an understanding that customer relationships are a very important factor for their success. However, there has been slow adoption of ICTs across the Libyan banking sector. This study seeks to determine whether ICTs have a role in building customer relationships within the banking sector in Libya in order to create customer trust, customer satisfaction and customer loyalty.
When considering the role of ICT in customer relationships, the experiences of establishing, building and maintaining these relationships should be considered. Given that acquiring a new customer is more expensive than maintaining a loyal customer (Elgahwash 2006, Hui Lin and Wang 2006, Afsar et al. 2010), it is suggested that banks should invest in relationships with existing customers as well as attempting to attract new customers (Al-Hajri 2008, Al-Hajri and Tatnall 2008). The use of ICTs for these purposes, as well as for enhancing customer loyalty (Thao and Swierczek 2008), is considered in this research. This chapter will introduce the main research hypothesis before explaining the theoretical framework used along with the hypotheses used to confirm the main research hypothesis.

**H: ICT has a positive / negative effect in generating customer relationships within the banking sector.**

This hypothesis is designed to evaluate the research questions (initially presented in Chapter 1 and provided below):

1. How does the use of ICT in the Libyan banking sector influence the establishment of relationships with new customers?
2. How does the use of ICT in the Libyan banking sector influence the maintenance of relationships with existing customers, and specifically, how does it impact on customer loyalty?
3. How does the use of self-service ICT in the Libyan banking sector influence experiences of service delivery and relationships with customers?
4. How does prior exposure to self-service ICT banking in developed nations influence customers’ expectations of and engagement with ICT in the Libyan banking sector?

To address these questions a quantitative and qualitative methods of study have been designed to evaluate the role of ICT in creating positive relationships with banking customers. The theoretical framework presented in this chapter addresses how the quantitative aspects of the study will be addressed,
2.11.2 Theoretical Framework

Based on the literature review, it is evident that ICT adoption by a bank impacts on the relationships it has with its customers, and also on the bank’s overall success. This research investigates the role of ICT in creating customer relationships in the Libyan banking sector. It is suggested that the outcomes of ICT adoption impact specifically on customer trust, customer satisfaction and customer loyalty.

2.11.3 Technology Acceptance Model (TAM)

One of the most popular and influential models used to study information technology adoption is Davis et al.’s Technology Acceptance Model (TAM) (Gupta et al. 2006). TAM has been widely used in many studies (Twati and Gammack 2006, Twati 2007, Twati 2008, Abukhzam and Lee 2010, Yaghoubi and Bahmani 2010). TAM evaluates user perceptions based on two key variables: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Abukhzam and Lee 2010, Alsajjan and Dennis 2010, Hernandez et al. 2010, Yaghoubi and Bahmani 2010), predicting user adoption of new technologies from a positive perspective. Consumers will reduce their usage or even refuse to use a technology if they subjectively expect that harm or a loss is likely to occur while using the technology. The degree of risk that a consumer perceives and their risk acceptance are attitudinal factors that affect their usage (Alsajjan and Dennis 2010, Ying and Can 2010).

TAM is a fully validated extension of the Theory of Reasoned Action (TRA). It introduced two belief factors – PU and PEOU – which substitute for many of TRA’s attitude measures. TAM’s two factors are used to determine an individual's intention to use a technology-based system, with the intention to use acting as a mediator of actual system use. PEOU is also posited to have a direct impact on PU (Alsajjan and Dennis 2010, Ying and Can 2010). Researchers have simplified TAM by removing the attitude construct found in TRA from the current specification (Xu et al. 2005).

Attempts to extend TAM have generally taken one of three approaches: introducing factors from related models, introducing additional or alternative belief factors, and examining antecedents and moderators of PU and PEOU (Shen and Chiou 2010).
2.11.4 Theory of Reasoned Action

The Theory of Reasoned Action (TRA) assumes that individual behaviour is driven by behavioural intentions, where behavioural intentions are a function of an individual's attitude toward the behaviour and subjective norms surrounding the performance of that behaviour (Peslak et al. 2010, Yousafzai et al. 2010). TRA essentially argues that social behaviour is motivated by an individual’s attitude towards executing that behaviour. Therefore, the change of behaviour is a function of one’s beliefs about the outcomes of the behaviour and an evaluation of the value of each of those outcomes. In short, TRA proposes that individual beliefs influence attitudes, and hence create intentions that will generate behaviour (Yousafzai et al. 2010). TRA has been widely used to explain and predict many related behaviours including loyalty. According to TRA, intention is the immediate determinant of behaviour.

The intention to accept or reject a particular technology is based on a series of trade-offs between the perceived benefits of the system to the user and the complexity of using the system. This technology-related experience can be reasonably explained using TRA.

An attitude toward the behaviour is defined as the individual’s positive or negative feelings about performing a behaviour. It is determined through an assessment of one's beliefs regarding the consequences arising from a behaviour and an evaluation of the desirability of these consequences. Formally, overall attitude can be assessed as the sum of the individual consequence and the desirability assessments for all expected consequences of the behaviour (Peslak et al. 2010, Yousafzai et al. 2010).

Subjective model is defined as an individual’s perception of whether others value the individual or activity and whether the individual thinks that the behaviour should be performed. The contribution of the opinion of any given person is weighted by the motivation of an individual to comply with the wishes of that person. Hence, the overall subjective norm can be expressed as the sum of the individual perception multiplied by the motivation assessments for all relevant people (Peslak et al. 2010, Yousafzai et al. 2010).
2.11.5 Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) posits that individual behaviour is driven by behavioural intentions, where behavioural intentions are a function of an individual's attitude toward the behaviour, the subjective model close the performance of the behaviour, and the individual's perception of the ease with which the behaviour can be performed (behavioural control).

Attitude toward the behaviour is defined as the individual’s positive or negative feelings about performing a behaviour. This attitude is determined through an assessment of one's beliefs regarding the consequences arising from a behaviour and an evaluation of the desirability of these consequences. Formally, overall attitude can be assessed as the sum of the individual consequence multiplied by desirability assessments for all expected consequences of the behaviour (Alsajjan and Dennis 2010).

Subjective norm is defined as an individual’s perception of whether people who are important to the individual think the behaviour should be performed. The contribution of the opinion of any given person is weighted by the motivation that an individual has to comply with the wishes of that person. Hence, an overall subjective average can be expressed as the sum of the individual perception motivation assessments for all relevant people.

TPB is also widely used in predicting behavioural intention. Customer behaviour studies developed a model to predict consumers’ intention to purchase using technologies. The study revealed that all three variables – attitude, subjective norms and perceived behavioural control – significantly influence the intention to purchase, especially in relation to use of the Internet for information search (Alsajjan and Dennis 2010).

2.11.6 Online Customer Loyalty

Building customer loyalty (CL) is a difficult process for most banks, including those in Libya.

In this research, loyalty is derived from the literature where the right customer is attracted to conduct business over an extended period of time. Loyalty is evidenced
by repeat purchases or interactions with services from a particular bank, including repeat usage of Internet banking or m-banking (Hui Lin and Wang 2006). In some cases, loyalty indicates intention to purchase; this relies on a customer’s skills for managing and controlling the relevant technologies (Flavian et al. 2006) (i.e. short term loyalty). Online loyalty is reflected in the willingness of customers to recommend services from their bank to other customers (Thao and Swierczek 2008) (i.e. long term loyalty). Therefore, customer loyalty has two components: long term and short term loyalty. Customers who demonstrate long term loyalty do not easily switch to other service providers. Short term loyalty allows the easy establishment of a relationship with customers when banks offer perceived better interaction (Tzer Liu et al. 2011). This research is concerned with long term customer loyalty, used in the establishment and enhancement of customer relationships through Internet banking and m-banking.

Electronic communication channels can make banks appear more attractive than their competition for prospective customers, and some customers have also identified feelings of loyalty toward their current bank because of the modern channels used to connect with them; in both cases, electronic communication enhances customer loyalty (Bove and Johnson 2006, Toelle 2006). Therefore, it is important to identify the desires and requirements of customers so banks can implement appropriate ICTs in order to build their base of loyal customers. The ability to offer products or services that meet customers’ needs leads to customer willingness to spend or invest (Elgahwash 2006).

Customer loyalty is one of the major factors in the relationship process because loyal customers are more likely to continue to have interactions with a certain bank. The literature contains many models about customer loyalty; these provided a number of factors that should be considered in the banking sector (Luarn and Hui Lin 2003, Deng et al. 2010).

There is no comprehensive model of customer loyalty in relation to the role of Internet banking and m-banking for creating customer relationships. Little work has been done on this topic in Libyan banks. Al-Hajri (2008) identified three approaches for enhancing customer loyalty: reducing the customer’s search cost; lowering entry barriers; and reducing the distinctiveness of the bank. Afsar et al.’s

After analysis of the cultural, environment and rules of the Libyan economy, it is evident that the context of this research (i.e. the Libyan banking sector) is influenced by different constraints to those found in other countries. Based on the literature, six factors were identified as potentially impacting on customer loyalty in the context of this research. The impact of these six factors on the loyalty of customers toward their particular banks and their influence on each other will be analysed.

Customer satisfaction has been linked to the trust in the bank-customer relationship, and together, these factors have a similar degree of affect on online customer loyalty. It is important to evaluate customer loyalty because online customer loyalty leads to many advantages such as reduced costs, more new customers and increased competitive advantages (Luarn and Hui Lin 2003).

\[
\text{Customer Loyalty} = \text{technology attitude (PEOU+PU)} + \text{Customer satisfaction (OBQ)} + \text{customer trust} \\
\approx (\text{CL} = \text{TA} + \text{CS} + \text{CT}).
\]

2.11.7 Technology Attitude

Technology adoption refers to the process through which banks or individuals decide to make complete use of modernization in their daily business (Abukhzam and Lee 2010). Technology attitude (TA) can act as a very powerful enabler towards the adoption of a new technology and it can perceive usefulness and ease of use for customers by ICT applications. The literature identifies five stages that technology users go through before they can adopt a new technology: awareness, interest, evaluation, trial and adoption (Abukhzam and Lee 2010). The literature reported that the key determinant of technology adoption is user attitude (Abukhzam and Lee 2010).
Al-Hajri and Tatnall’s (2008) study using TAM reported that banks’ performance can be improved by creating good relationships with their customers through improved customer service.

| H1: Perceived technological attitude has a positive influence on customer loyalty in the Libyan banking sector. |

### 2.11.8 Perceived Ease of Use

For the purposes of this research, Perceived ease of use (PEOU) is defined as an active factor of ICT use by customers, particularly in the process of Internet banking and Mobile banking and free of effort better services (Hsun Ho and Yin Ko 2008, Ayo et al. 2010, Sikolia et al. 2010, Ying and Can 2010). PEOU is related to a customer’s ability to know everything, anywhere at any time and to their capacity to engage with banks (Flavian et al. 2006). PEOU refers to the degree to which a person believes that using particular processes would be free of effort. It is necessary for successful ICT adoption. PEOU can be considered, in terms of technologies, as being easy to navigate, easy to learn and easy to manage (Pikkarainen et al. 2004, Al-Hajri 2008, Al-Hajri and Tatnall 2008).  

| H1-a: Perceived Ease of Use has a positive influence on technological attitude in the Libyan banking sector. |

### 2.11.9 Perceive Usefulness

Hsun Ho and Yin Ko (2008) found that customers are more willing to adopt ICT when they believe the ICT capabilities offered will provide great value and be useful in the long term. In this research, usefulness refers to the degree to which a person believes that using particular processes or systems can improve a bank’s performance (Pikkarainen et al. 2004, Ayo et al. 2010, Sikolia et al. 2010, Ying and Can 2010).  

| H1-b: Perceived Usefulness has a positive influence on technological attitude in the Libyan banking sector. |
2.11.10 Online Customer Satisfaction

In the banking industry, a key element of customer satisfaction (CS) is the nature of the relationship between the customer and the provider of the products and services (Ziaul Hoq and Amin 2010).

Customer satisfaction is defined as a customer’s achievement response; that is, a judgment that a product and / or service. As customer satisfaction reflects the degree of a customer’s positive feeling about a service provider, it is important for service providers to understand customers’ perception of their services. A high level of customer satisfaction may have a positive effect on long term customer loyalty (Seok Lee 2010, Albert et al. 2011).

Online customer satisfaction is an essential component of online customer loyalty because it has a strong positive and highly significant effect on customer loyalty (Hui Lin and Wang 2006). CS has always been considered for banking services, with the sector generally striving to deliver high quality services and products (Afsar et al. 2010). It also leads to improved individual loyalty because customers believe that banks will fulfil agreed conditions, and hence customers continue their purchase behaviour to develop relationships with banks (Flavian et al. 2006).

Satisfaction indicates a customer’s past purchase evaluation and is a response to their product or service experience. It is considered a strong predictor for behavioural variables such as repurchase intentions, word-of-mouth recommendations and loyalty (Hui Lin and Wang 2006). In a general sense, the level of satisfaction is always high when the customer pays the minimum price and achieves maximum usage. Dissatisfaction usually occurs when pricing in the banking industry is at its highest; for example, when interest rates on loans and charges on the usage of online services are high (Afsar et al. 2010).

At the individual level of analysis, user satisfaction in this study refers to the feeling that the user receives during and after their interaction with the online banking technology. Satisfaction is a personal attitude; therefore it can be strongly influenced by the individual differences of users. Satisfaction can also be measured in many ways – for example, satisfaction with a bank’s website could be measured based on how many visitors are satisfied with their interaction with the bank.
website, how many visitors return to the website for repeat purchases of services, or how many recommend the website to friends (Gritti and Foss 2010, Kuo and Wu 2012).

Satisfaction is one factor of customer loyalty; it is positively affected by customer loyalty. Customer satisfaction is an overall attitude formed and based on the experience after customers purchase product/services. It is a broad feeling affected by the quality and price of the services/products (Tzer Liu et al. 2011). While it is an assessment of the experience of interacting with the service provider up to the present time, it can also be used by customers to predict future experiences.

**H2: Perceived customer satisfaction has a positive influence on customer loyalty in the Libyan banking sector.**

### 2.11.11 Online Banking Quality

To encourage customers to engage in long term relationships, a variety of activities are required to develop, maintain and enhance the customer relationship. Online banking is one channel that provides varied opportunities here, and online banking quality (OBQ) is a key component of the successful integration of this channel into banking operations. Customers tend to judge relationships using past experiences, expectations, predictions and requirements (Tzer Liu et al. 2011). Product and service quality are also commonly noted as a critical requirement for satisfying and maintaining valued customers. In retail banking, the performance of the service provider in both core and relational dimensions of services was an important driver for customer satisfaction. Customer satisfaction in the banking sector is also influenced by the perceived competitiveness of the bank’s interest rates. The bank’s ability to deliver these benefits on a continuous basis is likely to have a significant impact on the level of customer satisfaction (Hoq and Amin 2010).

The concept of quality is very closely related with customer satisfaction; perceived quality has been demonstrated to have a positive effect on customer satisfaction. Online customer satisfaction is determined by previous online experiences; it does not depend on the financial aspect of the services (Afsar et al. 2010, Tzer Liu et al. 2011). OBQ includes the concept of online relationship quality, which refers to the quality of the relationship that customers received from their banks. Service quality
influences various aspects of relationship quality such as satisfaction and trust, which have positive effect on customer loyalty (Tzer Liu et al. 2011).

In some ICT business models, information is the core of the business. Information quality is an important asset to any bank; the term refers to the characteristics of the presented information. These characteristics include measures such as accuracy, relevancy, comprehensiveness, timeliness and preciseness of the information provided. It is also important to measure how the information is presented and organized, and how much control the user has of that information (Petter and McLean 2009). In an ICT environment, the quality of the content provided to the customer by the bank must be afforded a high level of significance.

There are three competing theories about the linkages between service quality and customer satisfaction. Service quality is the predictor of satisfaction, and satisfaction is an antecedent of service quality (Deng et al. 2010). Customers may change their attitudes and/or actions after using the banks Internet/mobile services. Service quality includes five dimensions: reliability, tangibles, responsiveness, assurance and empathy. However, only two of these dimensions lead to customer satisfaction; these dimensions are reliability and responsiveness. Based on these two dimensions, service quality can be used as a predictor of customer satisfaction.

| H2-a: Perceived online quality has a positive influence on customer satisfaction in the Libyan banking sector. |

### 2.11.12 Online Customer Trust

Trust is an important component for operational success in the banking sector. Trust is defined as the willingness to rely on an exchange partner in whom one has confidence; it is essential for customers to have confidence in exchanges with banks, particularly in the areas of reliability and integrity (Vatanasombut et al. 2008, Afsar et al. 2010, Tzer Liu et al. 2011). Trust is reflected by the collective beliefs held by a person, based on their customer perception about certain attributes of the bank. Customer trust is shown when customers accept delivery of a banking service; it reflects customer willingness to accept risk by putting themselves into a weak position (Al-Hajri 2008, Al-Hajri and Tatnall 2008, Al-Hajri and Tatnall 2008, Ayo et al. 2010). Flavian et al. (2006) found that trust has a great direct effect
on the loyalty of customers; trust is a key factor for encouraging the loyalty of individual customers to particular banks.

A trusting belief refers to users’ perceptions of attributes of services providers, including the ability, integrity and benevolence of the providers. Indeed, when customers trust service providers, increased satisfaction and loyalty towards these banks can be expected. Trust has positively affected satisfaction in the long term when customers feel confidence toward their banking provider. When customers are satisfied, this trust will grow over time. Trust can reduce feelings of risk in relation to the process of creating reciprocal relationships with customers. Consequently, when customers trust their service provider, they will continue using the services and will recommend these services to others (Deng et al. 2010).

Guo et al.’s (2010) study, conducted in Taiwan, found that trust is an important mediating factor between customer behaviour before and after purchasing a product. It can lead to long-term loyalty and strengthen the relationship between the bank and customer. As with loyalty, trust is a special psychological state that can only occur in certain relationships. Customers’ trust in their bank indicates confidence in the service quality and product quality provided by the bank. Customers who trust their bank are more likely to be loyal to that bank (Luarn and Hui Lin 2003, Tzer Liu et al. 2011).

The banking sector values customer trust because it can provide greater stability in customer relationships, and hence can reduce stressful interactions for banks. It creates commitment, reduces the costs of negotiating agreements and lessens customers’ fear of opportunistic behaviour by the service provider (Flavian et al. 2006). Trust is prioritized in relationship processes embedded in electronic banking channels, because customers must first trust the business before engaging in a banking relationship (Vatanasombut et al. 2008).

Trust between banks and their customers consists of two elements: trust in the bank’s honesty, and trust in the bank’s kindness. In this context, bank honesty describes the belief that the bank (or the bank’s representative) will do as they say they will, and fulfil their promises. Bank kindness describes the belief that the bank is interested in the well-being of the customer without the intention of opportunistic
behaviour, and that the bank will not intentionally take actions that negatively impact on the customer (Flavian et al. 2006, Hui Lin and Wang 2006, Afsar et al. 2010). Building trust requires the application of specific behaviours in all interactions. These behaviours that lead to trust are benevolence, competence, honesty and predictability (Sikolia et al. 2010).

**H3: Perceived customer trust has a positive influence on customer loyalty in the Libyan banking sector.**

However, this chapter has described the theoretical framework that will be used in this study. This theoretical framework, bringing together the ideas presented in this chapter, is depicted in Figure (2.1) below.

![Theoretical model developed for this study](image)

**Figure 2-1: Theoretical model developed for this study**

The model above suggests that technology attitude, customer satisfaction and customer trust, all have an influence on customer loyalty and thus can influence a customer’s decision to award their banking services to a particular bank. In a highly competitive banking environment, achieving online customer loyalty is a key factor in enabling banks to survive and grow.

### 2.12 Chapter Summary

In the early 1980s, Libya was one of the wealthiest countries in the world; its GNP per capita was higher than that of countries such as Italy, Singapore, South Korea, Spain and New Zealand (Al-Mabrouk and Soar 2009). However, in recent years Libya’s reliance on oil has seen it fall behind in areas such as ICT adoption. This is
now impacting negatively on the whole economy. In view of the above, Libya needs a comprehensive medium term strategy to reform its economy and make better use of its economic and financial potential by diversifying the economy and reducing the country’s dependency on oil (International Monetary Fund 2006, International Monetary Fund 2009). The Libyan economy is seeking to re-establish a sound banking system to succeed in reforming its economy, supported by recent legislative changes. This will require some polices, such as enhancing banking supervision and restructuring the banking system with build-up of strong infrastructure for ICT in most banks across the sectors in Libya. In conclusion, if Libya does not take steps to adopt ICT in the near future, its banks will suffer from lack of competitive advantage because ICT provides an improved marketplace and delivers a great picture for customers (Twati 2008).

ICT offers an integrated channel that can facilitate information access, collection, and analysis for both banks and customers. Both customers and bankers can actively participate and access the marketplace at all interaction phases. ICT provides not only tools for customers but also a new marketplace for banks where many conditions for customer have been enhanced. However, effective use of technology is not an effective strategy in itself (Portuese 2006).

This thesis will consider how ICT is, and can be, effectively used in the Libyan banking sector. The following chapter presents the research methodology.
CHAPTER 3: Research Methodology

3.1 Introduction

This chapter explains the methodology used in this thesis. It was, in large part, designed to evaluate the validity of the research hypotheses. Section 3.2 addresses and justifies the methodology approach, and choice of a combination of quantitative and qualitative techniques for the collection of data and the investigation of the research issue. Decisions concerning the selection of data, data collection methods, selected samples, the survey and interviews, and the data analysis are explained (Comm 2001, Al-Sukkar 2005, Vogel 2005). The methodology is described in terms of the tools, methods of measurement and testing of issues in the study, with both the methods and tools of previous studies identified from the literature leveraged to obtain the most comprehensive and accurate results (Karim and Hamdan 2010). Section 3.3 explains the quantitative methods used in this research, Section 3.4 explains qualitative methods used in this research and section 3.5 provides details on the reliably and validity of data analysis.

3.2 Methodological Approach

Design of the methodology is argued to be the most important stage of any research, as it has a great impact on the validity and truth of the results obtained and conclusions reached. Taking account of the objectives and hypotheses of the study, and reviewing previous important studies in the literature that examined the same subject area, the methodology for this study was designed as described below.

The literature identifies two basic approaches used in the conduct of ICT research, namely, qualitative and quantitative methods. This research employed both methods because high synergies (in terms of depth, detail and evidence collected) were sought from the selected data (Abu-Jaber 2007). Combining both quantitative and qualitative research methods has been confirmed to be more powerful than a single approach and very effective for testing hypotheses. The mixed method approach allows the collection of the data necessary to achieve the study’s aim and objectives and maximises the benefits afforded by both approaches (Hamed 2009). The
quantitative approach bases results on numbers and statistics that are presented as numerical figures, while the qualitative approach is focused on describing an event with the use of words (Abu-Jaber 2007).

Together, quantitative and qualitative data can provide a better description of the knowledge and skills that are required to solve issues and meet the challenges that occur when adopting ICT applications for interaction between banks and customers.

This research was concerned with identifying the current and potential roles of information technology in creating relationships with customers in Libyan banks (Mulligan and Gordon 2002). Definition of the research methodology requires explication of the steps to be taken toward the completion of the research (Twati and Gammack 2006, Twati 2007, Twati 2008). This plan is detailed below.

As explained above, both qualitative and quantitative methods were used in this research. Figure below identifies that quantitative data was collected from the surveys and qualitative data was then collected from semi-structured interviews. Both types of data were analysed, with the analysis of the quantitative data informing the semi-structured interviews. The data analysis method included numerous tests such as factor analysis to check reliability and validation while multiple linear regressions were applied to test the research hypotheses. These tests were performed with SPSS version 19. Once all data collection was complete, all data was integrated to address the studies hypothesis and research questions. This mixed method approach, as adopted by Al-Sukkar (2005), and used for the structure of this thesis, is shown in Figure 3.1.
In short, using more than one method to study the same phenomenon can strengthen the reliability and validity of the results. The data collection methods employed in this research were survey questions and interviews. These methods, both quantitative and qualitative, were used to explore the research objectives and provide a deeper insight into research results (Al-Sukkar 2005). The primary method of collection data of this study was survey. After analysis of the survey data, using semi-structured interviews were used to explore the survey findings and understand the results. When combined, the collected data provided a rich picture of the use of ICT in the Libyan banking environment.

### 3.3 Quantitative Methods

This section provides an overview of the quantitative data collection technique and analyses used in this study.
Quantitative approaches help the investigator to collect data on programmed implements that yield statistical data. Quantitative research involves analysing numerical data for the purpose of describing and explaining the phenomena that produced the results (Afsar et al. 2010). This then allows the research hypotheses to be accepted or rejected (Sarosa 2007).

Quantitative methods are ideal for establishing a quantifiable understanding of human experience through the use of numbers, statistics, examples, experiments, correlation studies by surveys and standardised observational protocols, simulations, supportive materials (Hamed 2009). In short, a quantitative study is the measurement and analysis of casual relationships between variables (Al-Sukkar 2005). As it is the intention of this research to study a phenomenon in context, it was essential to select methods that enabled interaction with research participants.

The quantitative research findings presented in this thesis are based on the research interpretation of events and the relationship between the variables. This research used a survey (i.e. written questionnaire) of Libyan bank customers who were living in Australia to investigate relationships between banks and their customers, as mediate by ICT (Feinberg and Tokic 2004).

### 3.3.1 Surveys

Surveys are one of most commonly used quantitative methods in ICT research. They provide a system for collecting information, in the form of opinions of a sample across population groups, and informing knowledge about the phenomena under study (Twati and Gammack 2006). There are several factors that support survey adoption in this research. A cross-sectional study of mature consumers using a self-administered questionnaire was considered most appropriate. It supports the collection of data with sufficient depth and quality. Surveys are also easy to distribute to a large number of people (Cavana et al. 2000, Podder 2005, Twati and Gammack 2006, Rose 2007). Thus, it is a suitable method for testing the hypotheses and it facilitates measurement of many variables by collecting primary data via a questionnaire. This method of data collection has the advantages of low cost per response, access to a wide range of respondents across all Australian cities and the opportunity for respondents to complete the questionnaire at their leisure time and
under their control (Rose and Fogarty 2006, Rose 2007, Roses et al. 2009). When applying the survey method, factors should be considered include type of sampling, type of population, question form, question content, response rate, cost, time available, budget, speed, and duration of data collection (Cavanaugh et al. 2000, Ab-Hamid 2006, Al-Omoush and Shaqrah 2010).

The present study employed a survey that was distributed to eligible respondents across Australia. This approach is common for collecting data from participants in studies investigating Internet banking and mobile banking (Sarosa 2007). The survey was either personally distributed or emailed to Libyans who held a bank account in Libya. (See Section 3.3.4 for details of sample selection.) The survey was accompanied by a cover letter in Arabic (official language of Libya) which explained the importance of the study and requested a response. The survey developed for this study included multiple elements to investigate the effectiveness of ICT in customers’ relationships with banks (Al-Sukkar 2005). It was self-administered.

### 3.3.2 Survey Design

The survey was divided into three main sections (see Appendix D (in English) and E (in Arabic). Individual respondents were asked to indicate their extent of agreement or disagreement with a range of statements relating to ICT acceptance on a 7-point Likert scale ranging from ‘1 = strongly disagree’ to ‘7 = strongly agree’ (Luarn and Hui Lin 2003, Aldlaigan and Buttle 2005, Zhang 2005, Hui Lin and Wang 2006, Hsun Ho and Yin Ko 2008, Chi Lee 2009, Seok Lee 2010). The survey questions required customers to indicate their level of agreement with each statement on the Likert scale (seven points), as shown in Table 3.1 (Yen and Gwinner 2003, Henry 2004, Aldlaigan and Buttle 2005).

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

Section A of the survey was used to record the demographic characteristics of the respondents – for example, gender (Male, Female), age (18-24, 25-34, 35-44, 45-
Section B contained a series of general questions about the types of technologies used by customers in the context of Libyan banking. It recorded respondents’ ICT adoption in terms of frequency, years of experience and types of activities. It also recorded respondents’ ICT adoption in the context of their engagement with Australian banking.

Section C asked respondents about any possible advantage that the implementation of ICT may have for their relationship with banks – for example, their opinions on the ICT elements that influence relationship building, the perceived usefulness, and perceived ease of use, trust, satisfaction and loyalty to a site.

This study used a survey to explore the intention of banking customers to use technologies in their banking. The survey was conducted during the period December 2010 – February 2011.

3.3.3 Instrumentation Items - Survey

There were 71 items for which respondents indicated their agreement or disagreement in the survey. The items, used to represent dimensions of customers’ relationships with ICT in the banking sector, are split across the constructs as follows:

- Technology Attitude (TA): nine items
- Perceived Usefulness (PU): seven items
- Perceived Ease Of Use (PEOU): six items
- Customer Trust (CT): eight items
- Customer Satisfaction (CS): six items
- Online Banking Quality (OBQ): 23 items
- Customer Loyalty (CL): six items
- Internet and M-Banking: six items
3.3.4 Survey Sample Selection

Based on the research objectives, it was essential that the survey sample consisted of customers of Libyan banks who used mobile banking and Internet banking to interact with banks, and who lived in Australia at the time of survey completion. This respondent sample was the most appropriate for determining the potential role of ICT in supporting relationship among customers and bankers in financial services of Libya within the context of this study.

A sample refers to engagement with one component of a population (Lind et al. 2004). A population is defined as a collection or as a set of all elements (individuals, objects or measurements) of interest in an investigation (Lind et al. 2004).

There are many kinds of sampling methods available for survey research such as probability sampling, convenience sampling, random sampling, systematic sampling and purposive sampling. This research employed a convenient sampling method to ensure that all data was relevant to the objectives of this study. A stratified sample of eligible participants was taken. This process refers to a technique of sampling in which each possible sample has the same probability of being selected from within the population of the known study.

The sample was chosen from the Libyan community (students) who live in different cities in Australia. At the time of the survey, the population of potential survey respondents was approximately 2,601 (753 higher education & ELICOS 1848) individuals who had experience with the Libyan banks included in the study (Australian Education International 2011). This sample was chosen because students are the ideal sample group for this study. Typically, they intend to return to Libya at the completion of their studies (a requirement of the scholarship on which they are studying) and they would have a bank account in Libya and in Australia. The study sought to investigate the motivating factors behind the decision to use the Internet and mobile banking to enhance interaction between customers and their bank. Although this sample is not normal of the typical Libyan population, previous studies in other countries have shown that professionals are more likely to engage in online activities (Ahmed et al. 2009; Donner and Tellez 2008; Jalal-Karim and
Hamdan 2010). These participants were also chosen by the Government to come to Australia and study advanced degrees (typically masters degrees and above) as they are opinion leaders in Libya and on their return they would have greater influence over the country’s population.

A previous study by Gait and Worthington (2009) that engaged with Libyan business firms confirmed that surveys (including those distributed by email, as in this research) were appropriate for engagement with a Libyan population – they facilitated fast data collection, control of the sample and good flexibility, all within a reasonable cost. The sample of this study has selected to cover all criteria requested of each objective that were addressed in the first chapter (i.e. demographics, experience and technology applications using banking systems), for more information see demographics and descriptive statistics (Section 4.1).

The sample size was calculated from the following formula:

\[ N = p(1-p)(\frac{Z^2}{E^2}) \]

In this study, the optimal sample size \( N \) was selected using a 95% confidence level, corresponding to a \( Z \) value of 1.96; the proportion \( p \) was 0.5 (the safest possible assumption), and the error or precision \( E \) was 0.05. Hence the equation is:

\[ N = 0.5 \times 0.5 \times \frac{1.96^2}{0.05^2} = 384.16 \]

This meant that the study required a distribution of at least 384 questionnaires to allow the research findings to be generalized for a larger population (Gait and Worthington 2009). A study by Pezeshki (2009) determined a sample size of 300 to be sufficient; with 100 as poor and 1000 as excellent.

The research population consisted of all Libyan citizens who were eligible to have a bank account. A total of 384 surveys were circulated among customers of the Libyan banking sector living in Australia. Only 164 surveys were returned and 23 responses were found to have numerous missing values (i.e. unfinished) or the respondent did not have appropriate bank accounts; these responses were therefore
unsuitable to be included in the analysis. Therefore 141 responses were usable, being true in all aspects, with the satisfactory response rate being 37% (Kridan 2006, Ahmed and Jamal 2007, Ahmed et al. 2007, Ahmed and Amir 2011).

These 141 surveys were prepared for data entry, with some additional coding required before the data was entered into the Statistical Package for Social Sciences (SPSS 19) software package. To ensure data accuracy, after the data was entered, 15% of survey responses (random sample) were checked for data entry errors.

3.3.5 Statistical Technique Used

On completion of the surveys by participants, all the raw data was analysed, recorded and coded. Errors were filtered and data was entered for subsequent statistical analysis. The chosen quantitative method of analysis is based on the research question, objectives, hypothesis and model of the study, with the questions in this study used to investigate the effect of ICT on customer relationships within the Libyan banking sector.

Collected data was tabulated, structured and recoded in Microsoft Excel, and then imported into the statistical analysis software SPSS (version 19) for detailed analysis. Descriptive statistics produced the frequency, valid percentage and cumulative percentages for variables, providing detailed information on the responses to each question item. The analytical approach made use of multiple linear regressions. This approach was selected after conducting a Literature Review (See Chapter 2) and was based on the hypotheses, objectives, and model of the study using the process.
This research has investigated seven factors (i.e. variables), including one dependent factor (Customer Loyalty (CL)) and six independent factors (Perceived Usability (PU), Perceived Ease of Use (PEOU), Technology Attitude (TA), Customer Trust (CT), Online Banking Quality (OBQ) and Customer Satisfaction (CS). Each factor was considered in detail, and the relationships between the variables were measured to assess the validity of the hypotheses of the study.

A number of statistical tests were employed in this thesis to analyse the survey data such as descriptive analysis, correlation (see Section 3.5.4), exploratory factor analysis (see Section 3.5.5), and multiple regression (see Section 4.2). Each of these tests had deferent styles of analysis and were designed to measure and investigate the variables and hypothesis under evaluation in this thesis.
3.3.5.1 Factor Analysis

Factor analysis is a method of data reduction and a statistical technique for analysing the correlations between a number of variables to reduce them to a smaller number of underlying factors and to determine the correlation of each of the original variables with each factor (Colman and Pulford 2006).

There are many different methods that can be used to carry out a factors analysis (such as principal axis factor, maximum likelihood, generalized least squares). There are also many different types of rotations that can be completed after the initial extraction of factors, including orthogonal rotations (such as varimax and equimax) which impose the restriction that the factors cannot be correlated, and oblique rotations (such as promax) which allow the factors to be correlated with one another.

Factor analysis is a statistical technique attempting to identify underlying factors, or dimensions, that explain the correlations within the variables (item statements) that have been used, and further, describe what the factors represent conceptually. The theoretical basis for factor analysis is that variables are correlated because they share one or more common components.

There are common techniques of conducting factor analysis such as exploratory factor analysis, when employing exploratory factor analysis, the underlying structure of a relatively large set of variables will be uncovered and identified. Exploratory factor analysis is the most commonly used form of factor analysis.

Factors analysis, based on the correlation matrix of the variables, is used to investigate the relationship between and among variables. Correlations usually need a large sample size before they are stabile (Lind et al. 2004), (for more detail see section 3.5.5).

3.3.5.2 Chi-Square

Chi-Square is the statistical test that helps to identify the significance of any alliances between two or more variables. In other words, it is the test of relationship between variables. There are different types of Chi-Square tests such as McNemar
Chi-Square. McNemar Chi-square is the most commonly used approximation used on nominal data, it was used to compare between two variables in this research (see Section 5.4.4).

3.4 Qualitative Methods

The use of qualitative research methods is now common, particularly in ICT research. Qualitative research is especially effective in obtaining culturally specific information about values, opinions, behaviours, populations and information and communication technologies. It is also useful for gaining extensive information (depth, different levels & real) on how banking could be adapted to use ICT applications and how the lack of, or poor, application of ICT can lead to failed customer relationships.

Qualitative studies establish the research domain through the use of introductory questions that outline the problems and hypotheses of the research. Qualitative interviews are one of the most important data gathering tools in all types of qualitative research – positive, interpretive and critical.

3.4.1 Interviews

A qualitative interview-based research approach was chosen, since this study was concerned with obtaining a better understanding of factors influencing consumer choice of Internet and mobile technologies in the banking sector. Semi-structured interviews were used to assess and explain the results achieved from the survey (Alhinai 2009).

There are numerous advantages of using a semi-structured interview approach. Interviews are flexible, allowing the interviewer to adapt the interview to the issues identified by each interviewee. They also lead to the collection of more accurate and honest responses, since the interviewer is able to explain both the purpose of the research and the individual questions. A further advantage is the high response rate; most people are more confident in their speaking ability than their writing ability (Hamed 2009), and are more able to express their ideas and explain their perceptions and opinions verbally as opposed to in written form. This is likely to be particularly true for the sample population in this study. As a result, individual
interviews were designed to obtain information from participants with experience and bank accounts both in Libya and in Australia. The advantages of semi-structured interviews can be summarised as follows:

1. Questions can be prepared ahead of time, allowing for both thorough preparation and the appearance of competence during the interviews.
2. Interviewees are provided the freedom to express their views in their own terms.
3. Two-way communication is encouraged. Those being interviewed can ask questions of the interviewer. In this way it can also function as an extension tool.
4. They confirm what is already known but also provide the opportunity for learning more about the issue. Often the information obtained will provide not only answers, but the reasons for the answer.
5. Interviewees may more easily discuss sensitive issues in a face-to-face setting due to the flexibility afforded through semi-structured interviews.

Interviews were conducted to gather valid and reliable data relevant to research questions and objectives (Hamed 2009). There are numerous types of qualitative interviews, such as structured interviews, group interviews and semi-structured interviews.

Semi-structured interviews are ideal as they can be specifically targeted to investigate and understand suggested views of customers who use technologies in the banking sector (Kaplan and Maxwell 1994). In a semi-structured interview, the interviewer may have prepared some questions previously, but there is a need for managing the interview process and responding appropriate to issues raised during each interview (Kaplan and Maxwell 1994). Interviews were conducted with a sample of customers to understand various viewpoints for building relationships with bankers through Internet and mobile banking (Al-Sukkar 2005, Thao and Swierczek 2008).

Semi-structured interviews provide the ability for interviewees to talk freely, to focus on the core point and to yield comprehensive knowledge about the study area. Interview questions were opening ended, contrasting with the closed questions used
in the survey. This method allowed participants to answer questions in their own words and express their personal opinions. It is common for interviewees to have some concern about the extent to which the interviewer can be trusted. In such cases, the interviewee may decide not to share information that he or she considers to be sensitive (Kaplan and Maxwell 1994).

Semi-structured interviews were conducted in person (rather than by telephone or online) to facilitate enhanced flexibility for both the interviewer and interviewees. Face-to-face interviews are one of the most effective procedures available for determining customers’ needs. They afforded the ability to observe body language for certain expressions and attitudes (Hamed 2009) as well as to build rapport, because they allow interaction between the interviewer and the interviewee (Abukhzam and Lee 2010).

Initially, the interviewer explained the aims and objectives of the research and that all information would be used and treated in a confidential manner. Permission was asked to commence the interview questions.

All the interviews were recorded and transcribed in the Arabic language. This allowed all participants to provide the greatest level of detail possible in their answers because this was their native language. The researcher recorded the first draft of the interview discussion in Arabic, and then approved translation separately for the final copy of the interview in English.

3.4.2 Interview Design

The interviews followed a semi-structured format. Participants were encouraged to freely express their views while the researcher maintain the flow of investigation within the focus and scope of the study (Cutcher 2004, Alhinai 2009). The fact that the interviews were semi-structured allowed conversation to flow where necessary in order to deal with issues as opposed to cutting off interviewees when they strayed from the topic (Sarosa 2007). It allowed the interviewee to express their opinions, concerns and feelings. Each interview took between 30-40 minutes (see Appendix I (in English) and J (in Arabic).
Each semi-structured interview was conducted like a conversation; the researcher (interviewer) engaged in a connection with the respondent (interviewee). The questions listed in Table 6 were asked when the interviewer feels it was suitable. The language of questions was essentially the same for all respondents to ensure consistent quality in responses.

The study conducted interviews as a data collection tool to:

(i) help identify variables and relations

(ii) support the results of data gathered through the surveys; and

(iii) Understand customer relationships in relation to the use of the Internet and mobile banking in the Libyan banking sector.

3.4.3 Interview Sample Selection

The interview records were used to assess and complement the results obtained from the survey. Interviews were performed with an accessible sample of undergraduate and postgraduate students at Australian universities aged 18 to 54 years old who held Libyan citizenship and were users of Internet and mobile banking. The age range of this sample conforms to that identified in the literature – young mobile and Internet banking users are the target and main driver of financial services around the world. The sample included both male and female customers with varied experiences of mobile and Internet banking. This variation in the background and experiences allowed a variation of opinions to be expressed (Alhinai 2009).

3.5 Reliability and Validity of Data Collected

3.5.1 Introduction

This chapter describes the data collected from the initial survey. Initially, an analysis is conducted to demonstrate the reliability of the data. This is followed by a discussion on the validity of the data. Factor analysis was used to identify and analyse the correlations between a number of variables in the data and confirm data validity. It allowed the collected data and many identified variables to be reduced to a
smaller number of underlying factors. The process and results of this factor analysis are presented.

### 3.5.2 Reliability of Data Analysis

To ensure that findings arising for this research can be significant, the scale used to measure variables needs to be identified as reliable. A popular method for measuring reliability is Cronbach’s alpha (α). It refers to the scale’s stability over a range of conditions. Cronbach’s α is based on the average correlation of items in a test if the items are standardized, and lies in the range of 0 to 1. Reliability is used to measure the extent to which a group will yield the same score when each item is removed (Emzio 2010, Selamat and Jaffar 2011).

Reliability of a model refers to its ability to provide essentially the same set of measurement scores for each item in a group when measured by a model. According to Hair et al. (Hair et al. 2003), values of a Cronbach’s α less than 0.6 is poor; 0.6 to 0.7 is moderate; 0.7 to 0.8 is good; 0.8 to 0.9 is very good and above 0.9 is excellent. The values of Cronbach’s α are presented in Table 3.2 below are greater than 0.6, so we can accept values of consistency.

**Error! Reference source not found.** below shows the values of Cronbach’s α for the items in the survey and indicates that the items are reliable, so there is no significant defect in internal consistency, with Customer Satisfaction (CS) and Customer Trust (CT) being marginally reliable. The result of Cronbach’s α shows that the results extracted from the other survey constructs are highly reliable. (Hair et al. 2003).

<table>
<thead>
<tr>
<th>Items</th>
<th>Number of items</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness (PU)</td>
<td>7</td>
<td>0.824</td>
</tr>
<tr>
<td>Perceived Ease of Use (PEOU)</td>
<td>6</td>
<td>0.897</td>
</tr>
<tr>
<td>Technology Attitude (TA)</td>
<td>9</td>
<td>0.771</td>
</tr>
<tr>
<td>Online Banking Quality (OBQ)</td>
<td>23</td>
<td>0.806</td>
</tr>
<tr>
<td>Customer Satisfaction (CS)</td>
<td>6</td>
<td>0.640</td>
</tr>
<tr>
<td>Customer Trust (CT)</td>
<td>7</td>
<td>0.655</td>
</tr>
<tr>
<td>Customer Loyalty (CL)</td>
<td>6</td>
<td>0.849</td>
</tr>
</tbody>
</table>
3.5.3 Validity of Data Analysis

Validity is concerned with the extent to which the tools in a model measure what they are believed to measure, and only that; i.e. it refers to the degree to which a measure accurately represents what it is supposed to measure (Toelle 2006). The purpose of assessing content validity is to ensure that the items developed in the previous steps reflect the content areas encompassed in the specific variables included in this study (Rose 2007).

Validity can be assessed in a number of ways, two of which are: content validity and statistical validity (including criterion-related validity and construct validity). This thesis evaluates whether the instrument used is statistically valid and whether the survey was designed sufficiently well to determine relationships between variables (Abu-Jaber 2007).

To ensure the validity of the survey for this study, two statistical tests are useful. The first test is the Criterion-related validity test which measures the correlation coefficient between each item in the field as well as all the items in the whole field. Internal consistency of the survey is measured by finding the correlation coefficients between each section in one field and the whole field. If the correlation coefficient has a p-value less than 0.01 or 0.05 for each field item, then the correlation coefficients of this field are significant at \( \alpha = 0.01 \) or \( \alpha = 0.05 \) respectively. In such cases, it can be said that the items of this field are consistent and valid as measures for what was intended (Abu-Jaber 2007).

3.5.4 Correlation Analysis

Correlation matrix of the variables was used to investigate the relationship between and among variables. Correlations usually need a large sample size before they stabilize.

Correlation is a general term that indicates the possibility of interdependence between variables (Lind et al. 2004), that is, it measures the degree of relationship between the variables. To test the customer data in this survey, a matrix of Pearson correlation of coefficients was constructed.
Table 3.3 below shows the Pearson correlation matrix for seven variables. It is
evident from Table 5.2 that the study variables (OBQ→CS, PEOU→TA, PU→TA,
TA→CS, CT→CL, CS→CL) all have correlation coefficients (0.409, 0.185, 0.577,
0.198, 0.399, 0.527 respectively) with statistically significant p-values less than
0.05.

The correlation coefficient value of 0.185 between PEOU and TA indicates these
variables were significantly and strongly correlated. In addition, both PU and PEOU
were found to be significant and related to TA. TA is significantly correlated with
CL and is less than CT and CS, so TA can play a mediating role between both PU
and PEOU and CL.

Table 3.3: Pearson Correlation Matrix

<table>
<thead>
<tr>
<th>Items</th>
<th>PU</th>
<th>PEOU</th>
<th>TA</th>
<th>CT</th>
<th>CS</th>
<th>CL</th>
<th>OBQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU</td>
<td>0.174*</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TA</td>
<td>0.577**</td>
<td>0.185*</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td>0.200**</td>
<td>0.211**</td>
<td>0.074</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS</td>
<td>0.444**</td>
<td>0.210**</td>
<td>0.336**</td>
<td>0.316**</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CL</td>
<td>0.291**</td>
<td>0.149**</td>
<td>0.198**</td>
<td>0.399**</td>
<td>0.527**</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>OBQ</td>
<td>0.346**</td>
<td>0.476*</td>
<td>0.317**</td>
<td>0.456**</td>
<td>0.409**</td>
<td>0.444**</td>
<td>1.000</td>
</tr>
</tbody>
</table>

* p < 0.05, ** p < 0.01

Also, the correlations between customer satisfaction (CS) and online banking
quality (OBQ) variables have a moderately high correlation. Prior studies have
reported that perceived quality is most strongly correlated with satisfaction (Afsar et
al. 2010); this study supports this prior work.

By looking at the correlation matrix between the variables, customer satisfaction
(CS) is most highly correlated with customer loyalty (CL). The correlation
coefficient of 0.527 between these two variables shows that satisfaction is
moderately related to the attitude of customers’ loyalty towards their bank. To
create satisfied customers, banks should meet customers’ needs. The link between
satisfaction and loyalty shows that, if a bank’s manager wants to have loyal
customers, they require strategies that satisfy their customers (Afsar et al. 2010).

The correlation matrix can be used to check the outline of relationships. For this
data, the majority of variables in Table 3.3 have p-values less than 0.05 separately.
In addition, almost all the other variables in Table 3.3 are weakly related with
correlation coefficients less than 0.5. From this analysis, all questions in the survey are reliable and valid for data analysis.

3.5.5 Exploratory Factors Analysis

Exploratory factors analysis is a statistical technique used to identify and explain the correlations among variables. The method identifies the relationship between variables that may indirectly be connected (Pezeshki 2009). Exploratory factors analysis was conducted to evaluate whether variables loaded against the other variables had an underlying relationship. Communalities of the items are shown in Table 3.5 below, identifying how much of the variance in the original variables is explained by the factor that has been extracted. For the initial factors, all the variance is explained, as is always the case with principle components factor analysis. The second column gives the result after the final factor extraction. For example, we can see that 74.4% of the variance in PU has been explained by the extracted factor. The lowest figure is for the variable PEOU with only 29.8% of its variance having been explained by the extracted factor. For an alternate approach to explaining the ‘Total Variance Explained’ see Appendix K: Total Variance Explained (Factor Analysis).

The Kaiser-Meyer-Olin technique (KMO) is used to measure sampling adequacy and hence determine whether the matrix is factorable. If the value of the KMO measure is greater than 0.6, then the matrix can be factored (Colman and Pulford 2006). For the current research the KMO measure is equal to 0.748, as shown in Table 3.4, which means that factor analysis can proceed. This value rejects the hypothesis ($p < 0.001$) that the correlation matrix is an identity matrix, without significant correlations between variables. All diagnostic tests produced satisfactory results. Therefore, confidence that factor analysis is a suitable method for data analysis is high. All measures had high internal consistency and this test is the most widely used for scale reliability based on internal consistency (Yin 2002, Colman and Pulford 2006, Toelle 2006, Brown 2008, Pezeshki 2009, Alsajjan and Dennis 2010, Safeena et al. 2010, Selamat and Jaffar 2011).

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</th>
<th>0.748</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett's Test of Sphericity</td>
<td>Approx. Chi-Square</td>
</tr>
</tbody>
</table>
All factors in Table 3.5 with an eigenvalue were greater than 0.5 were maintained. In addition, factor loadings of less than 0.5 were concealed. This follows standard practice (Colman and Pulford 2006, Chi Lee 2009, Afsar et al. 2010, Chi Lee 2010, Selamat and Jaffar 2011) with items that were cross-loaded being deleted.

Table 3-5: Communalities

<table>
<thead>
<tr>
<th>Items</th>
<th>Initial</th>
<th>Extraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU</td>
<td>1.000</td>
<td>0.744</td>
</tr>
<tr>
<td>PEOU</td>
<td>1.000</td>
<td>0.298</td>
</tr>
<tr>
<td>TA</td>
<td>1.000</td>
<td>0.768</td>
</tr>
<tr>
<td>CT</td>
<td>1.000</td>
<td>0.606</td>
</tr>
<tr>
<td>CS</td>
<td>1.000</td>
<td>0.547</td>
</tr>
<tr>
<td>CL</td>
<td>1.000</td>
<td>0.526</td>
</tr>
<tr>
<td>OBQ</td>
<td>1.000</td>
<td>0.859</td>
</tr>
</tbody>
</table>

*Extraction Method: Principal Component Analysis.*

Table 3.6, Total Variance Explained, shows all factors extracted, in descending order of their eigenvalues, together with the percentages of variance in the original variables explained by each factor, and the cumulative percentage of variance explained after the extraction of factors with progressively lower eigenvalues.

The columns on the right of the table show the Sum of Squared factor loadings before and after rotation, with the total percentage of variance, and cumulative percentage of variance indicated in each case. The table shows that the first extracted factor explains 42.45% of the variance in the original variables. The second column explains a further 16.81% and the other factors each explain only small amounts of the variance and are reserved in the analysis.

Table 3-6: Total Variance Explained

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative %</td>
</tr>
<tr>
<td>Dimensio</td>
<td>1</td>
<td>2.97</td>
<td>42.459</td>
</tr>
<tr>
<td>n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.96</td>
<td>13.841</td>
<td>73.109</td>
</tr>
<tr>
<td>4</td>
<td>0.63</td>
<td>9.054</td>
<td>82.163</td>
</tr>
</tbody>
</table>

129
This part of factor analysis considers the values that decide the linear components within the data set and aids in identifying whether predictors are dependent or otherwise. The eigenvalue for each factor represents the difference explained by that particular linear component and is also related to the percentage of the variance.

Factors that created eigenvalues greater than 1 were considered significant. Once these factors are identified, large numbers of variables can be reduced to a more controllable figure which can be achieved by factor extraction (Deng et al. 2010).

The component matrix in Table 3.7 shows that two components were extracted and lists the factor loadings before rotation.

<table>
<thead>
<tr>
<th>Items</th>
<th>Component 1</th>
<th>Component 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBQ</td>
<td>0.771</td>
<td>0.255</td>
</tr>
<tr>
<td>CS</td>
<td>0.738</td>
<td>-0.053</td>
</tr>
<tr>
<td>CL</td>
<td>0.682</td>
<td>0.247</td>
</tr>
<tr>
<td>PU</td>
<td>0.674</td>
<td>-0.538</td>
</tr>
<tr>
<td>CT</td>
<td>0.577</td>
<td>0.523</td>
</tr>
<tr>
<td>PEOU</td>
<td>0.492</td>
<td>0.237</td>
</tr>
<tr>
<td>TA</td>
<td>0.563</td>
<td>-0.655</td>
</tr>
</tbody>
</table>

The principal component method was used for factor extraction, under the restriction that the eigenvalue of each generated factor was more than 1. Factor analysis was conducted to develop constructs that would help analyse the survey responses and to evaluate factors that would influence customers’ adoption of ICT (Safeena et al. 2011).

A principal-component factor analysis was used to ensure adequate measures of validity and reliability based on the data. Scale’s KMO (Kaiser-Meyer-Olkin Measuring of Sampling Adequacy) exceeded Fang Lai et al.’s (2009) recommended level of 0.750. Also, it exceeded Al-Omoush & Shaqrah’s (2010) recommended
level of 0.7. Each scale’s ‘rotated component matrix’ exceeded the level of 50.00%. Table 3.8 shows the rotated component matrix, giving the factor loadings after rotation.

<table>
<thead>
<tr>
<th>Items</th>
<th>Component 1</th>
<th>Component 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>0.776</td>
<td>-0.060</td>
</tr>
<tr>
<td>OBQ</td>
<td>0.765</td>
<td>0.271</td>
</tr>
<tr>
<td>CL</td>
<td>0.690</td>
<td>0.223</td>
</tr>
<tr>
<td>CS</td>
<td>0.551</td>
<td>0.493</td>
</tr>
<tr>
<td>PEOU</td>
<td>0.534</td>
<td>0.114</td>
</tr>
<tr>
<td>TA</td>
<td>0.060</td>
<td>0.875</td>
</tr>
<tr>
<td>PU</td>
<td>0.203</td>
<td>0.838</td>
</tr>
</tbody>
</table>


The component transformation matrix in Table 3.9 only records the matrix algebra of rotation: the un-rotated matrix was multiplied by the component transformation matrix to produce the rotated matrix. The matrix shows the two extracted factors, reflecting the factor loadings for each of the original variables. Factors loadings are correlations of the original variables with each of the extracted factors. Some factor loadings are missing for ease of deciphering the tables because their values were less than 0.10 (Colman and Pulford 2006). Varimax rotation maximizes the amount of variance explained by the minimum number of variables.

<table>
<thead>
<tr>
<th>Component</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>1</td>
<td>0.790</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.613</td>
</tr>
</tbody>
</table>


3.6 Chapter Summary

This chapter has described the research design and the application of both quantitative and qualitative methods for data collection. Initially, surveys were conducted and results analysed. This data helped to give establish a broad picture of consumers’ perceptions in relation to ICT and banking, as well as establish the validity of the research model and the proposed hypotheses. These findings were then explored using semi-structured interviews.
This chapter presented the factor analysis conducted to develop constructs for use in the analysis of the survey responses and to evaluate factors that influence customer usage of ICT in the Libyan banking sector. The extracted factors were then rotated using variance maximizing method (Varimax). These rotated factors with their variable constituents and factor loadings are given in Table 3.8 above.

Factors loadings are numerical values that indicate the strength and direction of a factor on a measured variable and it indicated how strongly the factor influences the measured variable. All factor loadings as shown above are large and indicating that the items display good measurement of variables. We have examined the convergent validity of our model’ variables, so convergent validity is established when the average variance extracted for each measurement scale is at least 0.50. Overall, the results indicate that the six constructs demonstrate satisfactory levels of internal consistency and convergent validity. On the basis of the above procedures, confidence that convergent and differentiate validity has been established. Every scale item is statistically significant at the 0.05 level; therefore the data has good convergent.

The following chapter (Chapter 4) will review the research questions and analyse the survey data.
CHAPTER 4: Data Analysis

The methodology used in this research was explained in Chapter 3, and the reliability and validity of the data collected was confirmed in section 3.5. This chapter examines the research questions and objectives (as previously explained) and presents the data analysis in four stages: coding the responses; removing unsuitable data; selecting a suitable data analysis strategy; and testing the appropriateness of that strategy.

This chapter presents the data analysis of survey in three parts. Part one explores the demographic and descriptive statistics. Part two uses multiple regression tests to analysis data access to quality investigation and results. Part three investigates each of the hypotheses presented in Chapter 3.

4.1 Demographic Profiles of Respondents

Detailed analysis of the demographics and banking preferences of the respondents was the first step in the data analysis. This provided an understanding of the survey population. Initially, the analysis provides information about the respondents’ demographic information, in terms of gender, age and education level, which is a typical analysis used in most studies (Selamat and Jaffar 2011). This is followed by an analysis of responses about the use of technology in the banking sector. This descriptive analysis provides an understanding of the participant sample and its relationship to the overall population.

Previous research about customers’ attitudes relating to the adoption of Internet banking identified several factors that influence a person’s attitude towards, and actual use of, Internet- and m-banking. These factors include: demographic characteristics such as age, gender, and educational qualification; prior experience with computers and technology; personal banking experiences; and knowledge of and characteristics of Internet banking (Yiu et al. 2007).

<table>
<thead>
<tr>
<th>Items</th>
<th>Gender</th>
<th>Age of Respondents</th>
<th>Education level</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Valid</td>
<td>141</td>
<td>137</td>
<td>136</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 4-1: Statistics of demographic characteristics
Table 4.1 shows that 141 respondents participated in the survey. All provided valid gender responses, and the vast majority provided valid age and education level responses. As shown in Table 4.2, 73.8% of respondents were male and 26.2% were females, a ratio of almost 3:1 in favour of males. This heavily skewed sample towards male respondents may reflect a greater interest in or exposure to interactions with the banking sector for males; studies by Yiu et al. (2007) and Emzio (2010) reported that female respondents had a lower rate of adoption for technologies than males. However, there may also be cultural reasons for this skewed response rate.

Table 4-2: Sample demographics

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency</th>
<th>% valid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>104</td>
<td>73.8</td>
</tr>
<tr>
<td>Females</td>
<td>37</td>
<td>26.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>141</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Age group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 – 24</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>25 – 34</td>
<td>74</td>
<td>52.5</td>
</tr>
<tr>
<td>35 – 44</td>
<td>53</td>
<td>37.6</td>
</tr>
<tr>
<td>45 – 54</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td>55 - 64</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>137</td>
<td>97.2</td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>High Diploma</td>
<td>34</td>
<td>24.1</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>46</td>
<td>32.6</td>
</tr>
<tr>
<td>Post-graduate</td>
<td>53</td>
<td>37.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>136</td>
<td>96.5</td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td>5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

In regard to age, Table 4.2 shows that only two (1.4%) of the respondents were in the age group 18-24 years. The majority of the respondents (i.e. 74; 52.5%) were 25-34 years old, followed by 37.6% of respondents in the 35-44 years group. These two groups contributed approximately 90% of the overall respondents. Only 5.7% of the respondents were aged 45-54 years, and no respondents indicated they were over 55 years. The sample distribution of respondents’ ages potentially supports the previously reported conclusion that older customers are usually less willing to adopt new technology than are younger customers (Yiu et al. 2007). It is also important to note that this sample was based on Libyans residing in Australia (typically on student visas), which impacted on the age range of the sample; the distribution of respondents' ages appears to be appropriate for this population.

With respect to the level of education, Table 4.2. above shows that the vast majority of respondents had a high level of education (postgraduate studies). As most of the
respondents were Libyan students studying in Australian universities, this is expected. Libyans participating in this type of activity typically return to Libya and instigate change in the developing nation at the conclusion of their studies. Their positions in society will have the ability to influence the overall Libyan population and change the adoption rate of ICTs. They are therefore an interesting group for learning about the attitudes and behaviours of future leaders. Three (2.1%) of the respondents had high school education, 34 (24.1%) of respondents had a high diploma, 46 (32.6%) were undergraduates, and 53 (37.6%) were postgraduates at university.

The length of time that the respondents had been living in Australia is ranged from less than one year to 9 years. Table 4.3 shows most of the participants (i.e. 78; 55.3%) had spent one year or less living in Australia at the time of responding, 26 (18.4%) had been living in Australia between one and two years, 13 (9.2%) for between two and three years, and 16 (11.4%) had been living in Australia for more than four years. All of the participants had lived in the developed country of Australia for long enough to experience a modern Western banking sector with full ICT interaction.

Table 4-3: Period of living in Australia

<table>
<thead>
<tr>
<th>Time</th>
<th>Frequency</th>
<th>% valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>One year and less</td>
<td>78</td>
<td>55.3</td>
</tr>
<tr>
<td>One to two years</td>
<td>26</td>
<td>18.4</td>
</tr>
<tr>
<td>Two to three years</td>
<td>13</td>
<td>9.2</td>
</tr>
<tr>
<td>Four years and over</td>
<td>16</td>
<td>11.4</td>
</tr>
<tr>
<td>Total</td>
<td>133</td>
<td>93.7</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Table 4.4 shows respondents’ overall use of ICT tools, with a comparison of tool use by participants when in Libya and Australia. Please note that for this table when a respondent perceived that the ICT tool was not available to them they answered ‘not available’. When a respondent knew that the ICT tool was available and they chose not to use it they identified it as ‘don’t use’.

Table 4-4: ICT tools use in Libya and Australia

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>TELEPHONE Lib</th>
<th>TELEPHONE Aus</th>
<th>MOBILE PHONE Lib</th>
<th>MOBILE PHONE Aus</th>
<th>FAX Lib</th>
<th>FAX Aus</th>
<th>COMPUTER Lib</th>
<th>COMPUTER Aus</th>
<th>INTERNET Lib</th>
<th>INTERNET Aus</th>
<th>E-MAIL Lib</th>
<th>E-MAIL Aus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
<td>22.7%</td>
<td>18%</td>
<td>9%</td>
<td>0</td>
<td>29.7%</td>
<td>25%</td>
<td>9.9%</td>
<td>0</td>
<td>9.9%</td>
<td>0</td>
<td>11%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Don’t Use</td>
<td>11%</td>
<td>24%</td>
<td>5.6%</td>
<td>3.5%</td>
<td>21%</td>
<td>26%</td>
<td>7.8%</td>
<td>1%</td>
<td>3.5%</td>
<td>0</td>
<td>5.6%</td>
<td>3.5%</td>
</tr>
</tbody>
</table>
The traditional telephone had a greater level of use by the respondents in Libya than in Australia. Many respondents perceived that the telephone was not available (18%) or they did not use the telephone (24%) in Australia; this may have been due to living in temporary accommodation in Australia. 39% respondents used the telephone weekly, monthly or quarterly in Australia. When in Libya (before coming to Australia), respondents had a markedly different approach to the telephone. 63% participants used the telephone weekly, monthly or quarterly; 11% did not use this ICT tool; and 22.7% respondents stated that it was not available to them when they were in Libya.

The level of mobile phone adoption was different to traditional phone adoption. Of the respondents, 9% perceived that a mobile phone was not available to the participants when they were in Libya and another 5.6 % respondents did not use a mobile phone in Libya. 84 % respondents identified that they used a mobile phone weekly, monthly or quarterly when they were in Libya. In Australia, 94 % respondents identified that they use a mobile phone on a weekly, monthly or quarterly basis, and only 5 respondents not using this ICT tool.

Fax machines were the least used ICT tool. This is understandable given that the main functions of this tool have largely been replaced by more modern technologies, and the tool was typically used by businesses rather than individuals. The fax also had the highest level of non-response. 29.7 % respondents did not have access and 21 % respondents did not use a fax in Libya. Only 24 % respondents had experience in using a fax in Libya. In Australia, 25 % respondents did not have access to a fax and 26 % respondents did not use a fax. 19 % respondents had used a fax in Australia.

With regard to using a computer, in Libya, 9.9 % respondents indicated that a computer was not available to them. Another 7.8 % respondents said that they did not use a computer. 80 % used a computer weekly, monthly or quarterly. In Australia, only 1 % respondents did not use a computer. 96 % used a computer weekly, monthly or quarterly.
Internet use was similar to computer use. 9.9 % respondents stated that the Internet was not available to them in Libya and 3.5 % respondents were not Internet users in Libya. Totally 84% respondents used the Internet weekly, monthly or quarterly. In Australia, 96 % respondents used the Internet.

With regard to using e-mail, 11 % respondents identified that they did not have access to e-mail and eight did not use e-mail when they were in Libya. 71 % respondents used e-mail weekly, monthly or quarterly in Libya. In Australia, 83.6 % respondents used e-mail, with 0.7 % identifying that e-mail was not available and 3.5 % chose not to use e-mail in Australia.

The results of the descriptive analysis indicate that there was greater use of most technologies when respondents were in Australia compare to when they were in Libya. When the respondents leave Australia they are more exposed to technology (particularly as they are students and need to use the systems as part of their studies), given this high use of ICT tools generally, there is the potential for banking services to be carried out using the Internet and m-banking. This result confirms prior studies (Mylonakis 2009).

It is important to note that computer and Internet use of this respondent sample differs greatly from the national average of the Libyan population where only 17 % of the population had access to the Internet in 2012 (Internet World Stats 2012). This may be due to the fact that the respondents are in Australia furthering their education and that this is not a normal cross-section of the overall Libyan population.

Table 4.5 shows the length of time that the respondents had been using the Internet. 76 (54%) respondents have been using the Internet for less than one year and 28 (20%) for between one and two years. The number of respondents who have been Internet users for between two and five years was 16 (11%). Six (4.2%) respondents had used the Internet for more than five years.

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency</th>
<th>% valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not use/no response</td>
<td>13</td>
<td>9.2</td>
</tr>
<tr>
<td>Under one year</td>
<td>76</td>
<td>54</td>
</tr>
<tr>
<td>One to two years</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>Two to five years</td>
<td>16</td>
<td>11</td>
</tr>
</tbody>
</table>

Table 4-5: Length of time using the Internet
Table 4.6: Name of primary bank in Libya

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency</th>
<th>% Valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDB</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>WB</td>
<td>18</td>
<td>12.7</td>
</tr>
<tr>
<td>NCB</td>
<td>25</td>
<td>17.7</td>
</tr>
<tr>
<td>GB</td>
<td>54</td>
<td>38.3</td>
</tr>
<tr>
<td>NBC</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>SB</td>
<td>13</td>
<td>9.2</td>
</tr>
<tr>
<td>UB</td>
<td>11</td>
<td>7.8</td>
</tr>
<tr>
<td>gB</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>MB</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>SAB</td>
<td>1</td>
<td>.7</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.7 below shows that, in Australia, all respondents used the Commonwealth Bank (CBA), and therefore all had the ability to employ the self-service technologies offered by this bank. The Commonwealth Bank has been identified as a leader in online banking through CANSTAR (a privately owned ratings company in Australia) (CANSTAR 2013).

Table 4-7: Name of primary bank in Australia
Table 4.8 below shows respondents’ usage of banking technologies in both Libya and Australia. Results depict an increased usage of technology-enabled banking services when participants were in Australia compared with how they conducted their banking in Libya.

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency</th>
<th>% valid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid CBA</td>
<td>141</td>
<td>100.0</td>
</tr>
<tr>
<td>Missing</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Table 4.8: Banking technologies used in Libya and Australia

<table>
<thead>
<tr>
<th>Items</th>
<th>At-teller</th>
<th>Computer terminal</th>
<th>ATM</th>
<th>Phone banking</th>
<th>Internet banking</th>
<th>Mobile banking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lib</td>
<td>Aus</td>
<td>Lib</td>
<td>Aus</td>
<td>Lib</td>
<td>Aus</td>
</tr>
<tr>
<td>Not Available</td>
<td>19.8%</td>
<td>7.8%</td>
<td>58%</td>
<td>4%</td>
<td>55%</td>
<td>0</td>
</tr>
<tr>
<td>Don't Use</td>
<td>2.8%</td>
<td>25.5%</td>
<td>26%</td>
<td>53%</td>
<td>26%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Weekly</td>
<td>85.5%</td>
<td>18%</td>
<td>4.9%</td>
<td>21%</td>
<td>3.5%</td>
<td>90%</td>
</tr>
<tr>
<td>Monthly</td>
<td>63%</td>
<td>23%</td>
<td>3.5%</td>
<td>10.6%</td>
<td>4.9%</td>
<td>6%</td>
</tr>
<tr>
<td>Quarterly</td>
<td>3.5%</td>
<td>11%</td>
<td>0.7%</td>
<td>0.7%</td>
<td>4.9%</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>138</td>
<td>122</td>
<td>132</td>
<td>127</td>
<td>134</td>
<td>140</td>
</tr>
<tr>
<td>Missing</td>
<td>2%</td>
<td>13%</td>
<td>6%</td>
<td>9.9%</td>
<td>4.9%</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

In terms of using branch tellers, 19.8 % respondents stated that the service was not available to them in Libya and four respondents chose not to use a branch teller. Seventy five percent of respondents used tellers on a weekly, monthly or quarterly basis when they were in Libya. In Australia, 25.5% respondents did not use tellers with 7.8 % respondents stating that they were not available to them. Fifty three percent of respondents used tellers in Australia. The lower level of teller use in Australia could be attributed to language barriers as English was not the respondents’ native language.

Computer terminal usage at a branch was low in both Libya and Australia. Fifty eight percent respondents perceived this was not available in Libya, and 26 % stated that they did not use this technology. Nine percent of respondents used this technology in Libya. In Australia, 4 % respondents perceived that this option was not available and 53 % respondents did not use the computer terminals at branches. 32.6 % had used in-branch computer terminals in Australia.

Automatic Teller Machine (ATM) usage figures show that 55 % respondents stated that the service was not available to them and another 26 % did not use ATMs in Libya. Thirteen percent of respondents used ATMs in Libya weekly, monthly or quarterly. In Australia, 96 % respondents reported that they used ATMs, with only
2.8% respondents stating that they did not use them. These figures support a higher level of interaction with this particular self-service technology in Australia where access to ATMs is a lot higher than in Libya. This higher usage of ATMs in Australia, when considered alongside the lower use of tellers in Australia, indicates that respondents may use ATMs instead of tellers in Australia.

For phone banking in Libya, 56% respondents stated that this was not available to them while another 29.8% respondents chose not to use it. Seven percent of respondents used phone banking in Libya. In Australia, 34% respondents used phone banking, with 2% stating that it was not available to them and 53.9% stating that they did not use the technology.

Internet banking was shown to be used at a much lower level in Libya than in Australia. Sixty-five percent of respondents stated that it was not available to them to Libya, and 24.8% respondents stated they did not use it. 4% respondents had used Internet banking in Libya. In Australia, only 1% respondents stated it was not available to them with 9.9% stating that they did not use it. 83.6% respondents had used Internet banking while in Australia.

With regards to m-banking, 58% respondents did not have m-banking access in Libya and another 26% did not use the technology. Nine percent of respondents are used m-banking when they were in Libya. Four percent of respondents identified that m-banking was not available to them in Australia with 53% indicating that they did not use the technology. Thirty two percent of respondents used mobile banking weekly, monthly or quarterly in Australia.

The results of the descriptive analysis indicate that there was greater use of most banking technologies when respondents were in Australia compared to when they were in Libya. This analysis of the ICT technologies used by Libyans when they were in Australia identifies the tools that Libyan banks should focus their attention on when reviewing their technology-enabled offerings. Twati (2008) focused on the low level of ICT adoption in Libya and how this affects the banking sector. Survey results support these previous findings, confirming that technologies that are taken for granted in Australia, such as Automatic Teller Machines, are perceived to be unavailable to the majority of Libyans (i.e. 78; 55%) when they bank in Libya. The
results also show that traditional face-to-face interactions with a bank teller (used by 75% respondents in Libya compared with 53% respondents in Australia) are used less by Libyans when other technology-enabled services are available.

From the results presented above, it can be concluded that the majority of the respondents had employed the use of both Internet and m-banking technologies when they were available. Thus, the sample has sufficient knowledge of these self-service tools used in the banking sector to be suitable candidates for participation in this study.

4.2 Multiple Regression Analysis

Multiple regression is an extension of the basic bivariate (two variables or more) technique of linear regression. It is used as a statistical technique for analysing two or more independent variables (Colman and Pulford 2006). Multiple Regression Analysis (coefficient beta) was used in this study to analyse how the dependent variables are affected by independent variables, and to determine the strength and direction of relationships in the model. Multiple Regression Analysis was performed to test the relationships between the construct variables and ICT acceptance as conducted in previous studies that reviewed technology acceptance (Ab-Hamid and Kassim 2004, Selamat and Jaffar 2011).

Multiple Regression Analysis is a widely used, statistical technique for solving problems in the IS discipline. It uses the best straight line relationship to explain how the variation in an outcome (dependent variable) depends on the variation in a predictor (independent variable), to predict the value of the outcome variable for different values of the explanatory variable (Black et al. 2007). The hypothesized relationships, which were tested using multiple linear regressions, were based on previously validated models such as the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT).

Linear regression analysis estimates the coefficients of a linear equation, involving one or more independent variables that best predict the value of the dependent variable (Hair et al. 2003, Black et al. 2007). The assumptions of linear regression are:
1. The distribution of the dependent variable must be normal for each value of the independent variable.

2. The variance of the distribution of the dependent variable should be constant for all values of the independent variable.

3. The relationship between the dependent variable and each independent variable should be linear.

4. All observations should be independent.

The regression equation (developed for this study) needed to estimate and analyse can be represented in terms of the following:

$$E(CL) = \alpha_0 + \alpha_1 TA + \alpha_2 CS + \alpha_3 CT + \varepsilon$$

Where E(CL) is the expected value of the dependent variable (Customer Loyalty) with TA (Technology Attitude), CS (Customer Satisfaction) and CT (Customer Trust) being independent variables. The values $\alpha_0, \alpha_1, \alpha_2,$ and $\alpha_3$ are the regression coefficients and are estimated from the study data by a statistical process called least squares, and $\varepsilon$ is a random variable, usually considered normally distributed.

Furthermore, the values of TA were predicted by Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) while the values of CS were predicted by Online Banking Quality (OBQ).

![Diagram](Figure 4-1: Process for statistical Theoretical model of Study)
In table 4.9 shows the relationships tested with relevant dependent and independent variables. Each of the Phases listed is discussed further in sections below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Hypothesis</th>
<th>Dependent variables</th>
<th>Independent variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>H1-a</td>
<td>Technology Attitude</td>
<td>Perceived Ease of Use</td>
</tr>
<tr>
<td></td>
<td>H1-b</td>
<td></td>
<td>Perceived Usefulness</td>
</tr>
<tr>
<td>Phase 2</td>
<td>H2-a</td>
<td>Customer Satisfaction</td>
<td>Online Banking Quality</td>
</tr>
<tr>
<td>Phase 3</td>
<td>H1</td>
<td>Customer Loyalty</td>
<td>Technology Attitude</td>
</tr>
<tr>
<td></td>
<td>H2</td>
<td></td>
<td>Customer Satisfaction</td>
</tr>
<tr>
<td></td>
<td>H3</td>
<td></td>
<td>Customer Trust</td>
</tr>
</tbody>
</table>

### 4.2.1 Phase one: Technology Attitude

Technology Attitude (TA) refers to a bank’s or an individual’s feelings about and decisions surrounding the use of technology to complete a banking transaction (Abukhzam and Lee 2010). Here, this refers to the use of self-service technologies (Internet and m-banking). In this study, TAM was adopted and used to find factors that are useful for predicting the intention to use ICT as a tool for communication between a customer and their bank. For this study the possible predictors for TA considered were PEOU and PU. Therefore the relevant equation is:

\[
E(TA) = \alpha_0 + \alpha_1PEOU + \alpha_2PU
\]

The results of the regression indicated the two predictors explained 34% of the variance. This model is supported with a significant proportion of variance in the scores, \( R^2 = 0.34 \), \( F(2, 138) = 35.54, p < 0.000 \).

\( R^2 \) is the proportion of variation in the dependent variable explained by the regression model. The values of \( R^2 \) range from 0 to 1 with small values indicating that the model does not fit the data well. \( R^2 \) can be used to aid in determining which model is most appropriate.

The results of the regression show that the coefficients of PEOU, \( b = 0.088, t (138) = 1.247, p = 0.215 \), and PU, \( b = 0.561, t (138) = 7.994, p < 0.000 \). The constant term was estimated at 16.726. Hence TA can be predicted from the equation:

\[
E(TA) = 16.726 + 0.088 \cdot PEOU + 0.561 \cdot PU
\]
4.2.1.1 Perceived Ease of Use

PEOU is related to the consumer’s ability to know everything, anywhere at any time and their capacity to engage with banks (Flavian et al. 2006).

<table>
<thead>
<tr>
<th>H1-a: Perceived ease of use has a positive influence on technological attitude in the Libyan banking sector.</th>
</tr>
</thead>
</table>

Regression indicated that PEOU was not significantly related to TA. The regression coefficient has p-value = 0.215 which is larger than α = 0.05. As no significance has been identified (p-value = 0.215) H0-a is not rejected. Thus, there is insufficient evidence to conclude that PEOU of self-service technologies in Libyan banks is linearly related to technology attitude.

The result of this data analysis is not in agreement with other published studies (Brown 2008, Yaghoubi and Bahmani 2010, Selamat and Jaffar 2011). This may be explained by a lack of available infrastructure required to complete self-service banking transactions in Libya, therefore making it difficult for customers in the Libyan banking sector to use ICT technologies. As analysis of respondents’ prior experience has identified, respondents did engage with these technologies in Australia.

4.2.1.2 Perceived Usefulness

PU refers to the degree to which a person believes that using particular processes/systems can improve their performance (Pikkarainen et al. 2004, Seok Lee 2010). Here, these systems refer to banking systems. In general, hypotheses concerning PU predict that PU is positively correlated to TA.

<table>
<thead>
<tr>
<th>H1-b: Perceived usefulness has a positive influence on technological attitude in the Libyan banking sector.</th>
</tr>
</thead>
</table>

With the significance of p-value < 0.000, H0-b is rejected. Thus, there is sufficient evidence to conclude that the PU of self-service technologies in Libyan banks is linearly related to TA. There is sufficient evidence to conclude that customers have found these technologies useful for interacting with their bank.
PU has an indirect influence, via TA, on CL, which in turn leads to greater acceptance of online banking. This result has been supported by previous studies (Yaghoubi and Bahmani 2010). Studies by Yaghoubi and Vahmani (2010) and Pikkarainen et al. (2004) concluded that PU is more significant than PEOU in explaining TA.

### 4.2.2 Phase Two: Customer Satisfaction

This study investigated the nature of the relationship between the customer and their banking provider with regard to the products and services offered. A high level of CS may have a positive effect on long term CL (Hoq and Amin 2010, Seok Lee 2010, Eid 2011). CS is most significantly influenced by high service quality provided by banks; when customers perceive the quality of online banking (OBQ) services and products to be high, they have a high degree of CS toward the service they have received. This result has been reported in the literature in studies by Yen and Gwinner (2003) and Deng et al. (2010).

OBQ is a possible predictor of CS. OBQ includes the quality of the online information received and relationship experienced by customers from their banks, as well as the services and product quality. Service quality and product quality influence aspects of relationship quality such as satisfaction; these have positive effect on customer loyalty (Tzer Liu et al. 2011). Therefore, the relevant equation is:

$$E(CS) = \alpha_0 + \alpha_1 OBQ$$

OBQ is commonly identified as a critical requirement for maintaining long-term customers who perceive they are valued by an organization. A bank’s ability to deliver benefits on a continuous basis has previously been identified as having a significant impact on the level of customer satisfaction (Hoq and Amin 2010, Tzer Liu et al. 2011). The concept of quality is very closely related with customer satisfaction, and perceived quality has a positive effect on customer satisfaction (Eid 2011).

**Alternative hypothesis** H2-(a): Perceived online quality has a positive influence on customer satisfaction in the Libyan banking sector.
The results of the regression indicated the predictor explained 16.7% of the variance. Regression analysis supported the model with a significant proportion of variance in the scores, $R^2 = 0.167$, $F(1,139) = 27.918$, $p < 0.000$. The data confirms that online quality is a significant positive predictor of customer satisfaction, $b = 0.409$, $t(139) = 5.284$, $p < 0.000$. The constant term was estimated at 12.895.

The estimated equation predicting CS from OBQ is:

$$E(CS) = 12.895 + 0.409 \cdot OBQ$$

### 4.2.3 Phase Three: Customer Loyalty

CL is one of the major factors in the relationship process, because loyal customers are more likely to continue their relationship and have ongoing interactions with their bank. The predictors of CL are TA, CS and CT.

CT is an important component for operational success because it is concerns the willingness to rely on an exchange partner in whom one has confidence (Vatanaasombut et al. 2008, Afsar et al. 2010, Tzer Liu et al. 2011). In a banking context, CT is concerned with the delivery of banking services with regard to a customer’s willingness to accept risk (Al-Hajri 2008, Al-Hajri and Tatnall 2008, Al-Hajri and Tatnall 2008, Ayo et al. 2010). CL was regressed against each of the predictors individually and then combined in the full model.

$$E(CL) = \alpha_0 + \alpha_1 TA + \alpha_2 CS + \alpha_3 CT + \varepsilon$$

The resulting values of $R^2$ and estimates of the coefficients (beta with their p-values) are shown in Table 4.10 below.

<table>
<thead>
<tr>
<th>Predictor(s)</th>
<th>$R^2$</th>
<th>Coefficient (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Technology Attitude (TA)</td>
<td>0.039</td>
<td>0.209 (0.019)*</td>
</tr>
<tr>
<td>(2) Customer Satisfaction (CS)</td>
<td>0.277</td>
<td>0.592 (0.000)**</td>
</tr>
<tr>
<td>(3) Customer Trust (CT)</td>
<td>0.160</td>
<td>0.499 (0.000)**</td>
</tr>
<tr>
<td>(4) TA, CS and CT</td>
<td>0.339</td>
<td>0.033 (0.653)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>TA</th>
<th>CS</th>
<th>CT</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4) TA, CS and CT</td>
<td></td>
<td>0.433 (0.000)**</td>
<td>0.260 (0.001)**</td>
</tr>
</tbody>
</table>

* $p < 0.05$, ** $p < 0.01$
The regression equation for the full model ($R^2 = 0.339$, $F(3,137) = 23.391$, $p < 0.000$) is:

$$E(CL) = -0.002 + 0.033 \cdot TA + 0.433 \cdot CS + 0.260 \cdot CT$$

Each of the predictors is significant when regressed individually on CL. However, only CS and CT are significant predictors in the full model. The three hypotheses, based on the full model, are tested below.

**H1:** Perceived technological attitude has a positive influence on customer loyalty in the Libyan banking sector.

In the full model, the data does not support the hypothesis that technological attitude significantly and positively influences customer loyalty, $b = 0.033$, $t(137) = 0.450$, $p = 0.653$. Thus the null hypothesis is accepted.

**H2:** Perceived customer satisfaction has a positive influence on customer loyalty in the Libyan banking sector.

In the full model, the data supports the hypothesis that customer satisfaction significantly and positively influences customer loyalty, $b = 0.433$, $t(137) = 5.587$, $p < 0.000$.

**H3:** Perceived customer trust has a positive influence on customer loyalty in the Libyan banking sector.

In the full model, the data supports the hypothesis that customer satisfaction significantly and positively influences customer loyalty, $b = 0.260$, $t(137) = 3.549$, $p < 0.001$.

**4.3 Interview Analysis**

**4.3.1 Introduction**

Using a qualitative research methodology, this research collected rich data by way of semi-structured interviews. Qualitative data analysis refers to the search for general statements about relationships among the categories of data collected (Hamed 2009). A carefully selected sample allowed exploration of different
experiences among various customers from the sample of Libyans who have banking accounts in both Libya and Australia.

The purpose of the interviews was to enhance understanding of the quantitative survey data through further exploration of the issues identified. Qualitative data from the interviews was analysed to explain important aspects of the adoption and use of self-service technologies from the customers’ perspective. This chapter provides a detailed analysis of the interviews.

### 4.3.2 Interview Procedure

The primary goal of the interview method is to balance the systematic collection of data with the flexibility needed to explore respondents’ understandings. A semi-structured interview technique uses detailed and clearly stated questions that are initially addressed to each participant; this is useful in the process of standardising responses that can range widely in opinion. It then allows the interviewer to explore further items raised by the interviewee. The value of interviewing is its ability to collect rich qualitative data about particular processes from the viewpoint of selected individual customers. This method allows the discovery of hidden information that is not identified through a survey alone.

Through the use of semi-structured interviews, the interviewer can adjust the order of the questions and allow further questioning of the interviewee depending on their responses to previous questions. There is the possibility for the interviewer to give explanations for questions where the interviewee does not fully understand the question being asked or their response is not fully aligned with the question asked. However, for this to occur, an interview procedure needs to be fully developed and applied consistently across all interviews.

In this study, the majority of the questions were prepared before the interview process. A list of these questions can be found in Appendix I (in English) and J (in Arabic). The main purpose of the interview was to get the interviewee to talk freely and openly, to obtain in-depth information about the interviewee’s attitude towards using self-service banking technologies.

The following procedure was employed for the interviews:
1. Each interviewee was contacted in advance. The goals of the interview were explained to each interviewee before starting the interview. This was done by providing each interviewee (i.e. participant) with a participant information sheet (See Appendix F (in English) and G (in Arabic). Each participant was required to be a customer of a Libyan bank and also hold an Australian bank account.

2. Ethics permission was obtained from each interviewee prior to the commencement of the interview.

3. An appointment time and location was scheduled for the conduct of each interview. The places selected were private, comfortable, quiet and easily accessible for the respondent.

4. Interviews were designed to be 30-40 minutes in duration. Each interview began with general questions, which were then followed by open-ended questions. Consideration was given to ensure that as few questions as possible were asked of each interviewee. The focus was on facilitating a conversation about their relationship with their banks, and how they conducted their banking tasks either traditionally or through self-service technologies.

5. After each interview was completed, the information and answers to the questions were tabulated on an interview sheet and each interviewee was assigned a number (e.g. C1 for the first interview). This number was recorded on the interview sheet, and was used as the reference in all future comment on the interview in the thesis.

6. All files were labelled and the interviews were transcribed.

7. All the transcribed interview data was then translated from Arabic into English (interviews were conducted in Arabic as the participants’ native language was Arabic, and they were therefore more comfortable discussing the issues they faced in their native language).

8. Coding the English transcriptions for each interview was conducted using a manual technique; the codes represent themes that were gathered in the surveys (PU, PEOU, TA, OBQ, CS, CT and CL). The number of coding categories was increased and they were fine-tuned as each additional interview was coded. An important feature of the interview analysis process
was that it enabled the researchers to easily apply more than one code to a particular section of the transcribed interview.

9. At the completion of all transcription coding, reports were generated to provide the quotes that supported each theme. The themes were then used to understand interviewee experiences with self-service technologies in the banking sector.

**NOTE: As the interviews were transcribed from Arabic to English, the statements made by participants have been italicised in this thesis.**

Overall, the information gathered from the interviews was classified using an analytical framework based on the research objectives and through discussions with the interviewees about the issues that mattered to them most about use of self-service technologies in the banking sector. The process involved identifying the main ideas expressed for each issue and then identifying the most important points and classifying them.

Upon completion of fifteen semi-structured interviews, it was determined that this number was sufficient. The interviews were conducted to further understand and justify the research objectives and to support and extend the survey findings. After fifteen interviews, the same themes were being repeated by the interviewees and no further information was being added to the data set.

### 4.3.3 Interview Findings

Table 4.11 shows interviewees’ demographics summarised according to five major characteristics collected in the surveys. From an overall analysis of the data in Table 4.11, the interviewees were of similar background to the survey population, with a higher level of education. It was expected that this sample would be able to clearly articulate their ideas of self-service technologies in the banking sector and provide further insight into this study; this was found to be correct during the interviews.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Gender</th>
<th>Age</th>
<th>Educational level</th>
<th>Internet and m-banking experience</th>
<th>Libyan Bank</th>
</tr>
</thead>
</table>

150
Interviewees’ period of usage of Internet and m-banking in Australia can be summarised as:

- Four interviewees had not used self-service technologies;
- Three interviewees had used self-service technologies for less than 1 year;
- Six interviewees had used self-service technologies for 1-2 years;
- One interviewee had used self-service technologies for 2-5 years; and
- One interviewee had used self-service technologies for over 5 years.

The last column of Table 4.11 above, lists the Libyan bank that was each interviewee’s primary bank. In Australia, all interviewees used the Commonwealth Bank of Australia (not shown in the table). Gumhoria Bank (GB) was used by most of the interviewees; this is similar to the results for the survey participants.

Table 4.12 below presents a summary of the interviewees’ demographics. Similarly to the survey participants, the majority were male and aged 25-44 years.
4.3.4 Technologies used in the Libyan Banking Sector

This section reports the interviewees’ responses to overall ICT applications in the banking sector, ranging from time spent to availability of online activities. It reveals the use of each technology by participants when in Libya. All of the interviewees had been with their current bank in Libya for an extensive period, and therefore were considered to be loyal to their bank. The shortest period a participant had been with their current bank was two and a half years, with over one third of the interviewees stating that they had been with their current Libyan bank for over 10 years.

Table 4.13 below shows the usage of technologies by the interviewees when they were in Libya. The data demonstrates that the interviewees employed limited use of technologies when engaged in business with their banks. This is similar to the range of experience amongst participants in the survey.

<table>
<thead>
<tr>
<th>Items</th>
<th>Telephone</th>
<th>Mobile Phone</th>
<th>Fax</th>
<th>Computer</th>
<th>Internet</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Available</td>
<td>10</td>
<td>6</td>
<td>10</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Don’t Use</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Weekly</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Monthly</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Quarterly</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

4.3.5 Interview Responses

Interviewee responses revealed a belief that customers choose a particular bank based on the different facilities provided and the advantage that these offer compared with other banks. The quality of the relationship with the bank is an important feature for customers, and a key reason in choosing a particular bank. This was supported in the literature review (see Section 2.4.4), where quality was related to service delivery provided in a professional manner. ‘Online Banking Quality’ (OBQ) was identified in the surveys as an element of system quality that represents the ability of a bank’s external-facing processing systems and related technologies, and considers improvement in system performance for customers through self-service technologies. Information quality is concerned with the value
of information provided by a bank’s system for serving its customers (Pratyush 1998). It is argued that system quality and information quality have the potential to create a positive customer experience (via the use of self-service technologies). Five interviewees [C2, C3, C5, C7 & C12] identified the theme of quality with regard to the services offered by their bank.

C5 stated that: *In my opinion, this bank has a high quality of banking service. When I transfer money or make a bill payment, it is very easy to use technology applications, such as using credit card via my bank’s ATM.*

C12 stated that: *The bank has quite good quality of services because it has good ideas about how to serve customers’ needs efficiently with a high degree of performance. Moreover this bank provides advisory services such as a face-to-face financial consultant.*

Another element identified by the interviewees that reflected strongly on the quality of service provisions was that of use of ICTs within the banking environment.

C2 explained that: *When they meet my needs, the electronic applications at my bank enable less stress compared with the traditional way of banking services. This is a result of my bank having a high support system where it shares critical information with regards to my privacy, and providing outcomes, loan information and letting me transfer money.*

The participants' responses indicated that the banks had a clear understanding of the value of quality use of technology to support their customers, and the interviewees perceived that their banks had expertise in providing a banking system focusing on providing services to solve challenges faced by customers. Through the Internet and m-banking, these are available at any time.

### 4.3.5.1 Customer Loyalty

As stated previously, customer loyalty is a function of exciting benefits, satisfaction and trust. Ten interviewees agreed that they preferred to be loyal to a bank, and they exhibited customer loyalty [C2, C3, C5, C6, C7, C8, C9, C10, C13 & C15],
C7 stated that: *Absolutely Yes! I classify myself as a loyal customer because my bank provides satisfying services and of course it lets me have easy interactions with the bank’s website. It has packaged services using electronic applications – these are more than my expectations and the bank has complete knowledge of my needs.*

There were five interviewees [C1, C4, C11, C12 & C14] who did not value or feel they exhibited customer loyalty for their banks. For example, C12 stated that: *I cannot classify myself as loyal with this bank because it does not have a clear plan or strategy for technology interaction with me, so it does not satisfy my needs, meet my high expectations or increase delivery of valuable services.*

The comments from these five interviewees may result from a lack of awareness and misunderstanding of their banks’ plans to implement ICT systems, as most of these interviewees did not use any of the technologies when they were in Libya. Promotion by the banks on the self-service technologies would increase customers’ understanding of their availability and benefits.

### 4.3.5.2 Recommendations of Bank’s Services to Others

An important aspect of loyalty is a customer’s willingness to support and recommend their bank’s services to family, friends, colleagues and neighbours. Seven interviewees [C3, C5, C7, C8, C10, C12 & C13] had recommended their bank to others in the past. Recommendations have the ability to increase a bank’s reputation and competitive advantage, particularly when a customer has been with a bank for long period of time demonstrating their own loyalty.

For example, C7 stated that: *There are many reasons that let me support this bank to my family, friends, neighbours and colleagues – this bank has the ability to deliver on what they offer and put service in my hands. This bank provides the best services and useful information through IT applications in real time, and it is possible to avoid any future challenges or risks.*

C12 stated a similar main reason for recommending their bank: *My bank provides many types of services – easy to use applications, they remove challenges, deliver loans information, save time, deliver speedy services, let me withdraw money, give*
access to accuracy information – with relatively good speed. This bank lets me use ATMs for easy access to my account and to withdraw money. This is a more active and better alternative channel than using a chequebook to find out my account balance. The bank delivers some extra advantages such as loans as well.

However, seven interviewees [C1, C2, C4, C6, C9, C11 & C15] had not recommended their bank to others. C2 stated that: There is not a really good level of online services at this bank.

Also, C4 and C14 made comments that their banks provided a low level of online services, and when they conducted business at these banks recently they had received bad service.

4.3.5.3 Internet and M- Banking

A series of questions were asked to explore interviewees’ perceptions of Internet and m-banking, and determined whether the interviewees perceived that these self-service technologies could be used by banks to enhance the services that they offered customers. All fifteen interviewees believed that ICT had advantages and could be used by customers to complete their transaction processes (such as money transfers) with ease.

Three different reasons were provided by interviewees for believing that Internet and m-banking can be to enhance transaction processes. Examples of each of these responses are provided below.

C3 stated that: Internet and m-banking can reduce overcrowding at the bank teller and lead to an increased degree of services, anywhere, because I can complete bank procedures from my home or office without the need to go to the branch, so it saves my time and my effort especially when I need to pay bills or transfer money.

C12 stated that: My bank provided a number of channels to manage my money and accounts anytime through modern electronic channels to serve my needs. In my opinion, those services by electronic tools will be supported by my interactions with the bank. This is related to many advantages, such as my ability to find out about my account and receive bank statements without wasting time going to the bank. I
can receive enough information about the operation of my accounts with low risk and cost.

C15 stated that: *Internet and m-banking can save time, increase my degree of trust and reduce my stress.*

With regard to these self-service technologies meeting the needs of customers, the interviews revealed that the majority of the interviewees believed that it was very useful to have access to financial information. Internet and m-banking self-service technologies were believed to increase the convenience of banking activities (such as paying bills) through reduced travel time to a physical branch, reduced paperwork and 24/7 services access.

Seven interviewees [C3, C7, C8, C10, C12, C13 & C14] provided comments that were positive with regard to Internet banking.

C3 stated that: *The Internet offers services and meets my needs in real time with enough information to address any questions.*

C8 stated that: *Online banking exceeds my expectations with complete convenience of service.*

C10 stated that: *Online banking has the possibility to enhance and provide amazing services.*

C12 stated that: *The Internet offers real and enough information with complete privacy, there is no one else who has information about my accounts. It means the bank has a protection process for information which is related to my account.*

C13 stated that: *I can achieve the best banking experience via online banking.*

M-banking is a subset of Internet banking as it allows easy access to banking services via mobile handsets, typically through modified versions of the Internet banking services. Five interviewees [C3, C7, C8, C12 & C13] referred to the concept of m-banking in their interview when discussing the benefits associated with self-service technologies.
C3 stated that: *My m-banking provides simple and brief messages about banking accounts and other critical information, so it gives flexibility in communication with banks’ employees so I can know everything at anytime.*

C7 stated that: *The bank sometimes sends short messages to inform me about my account transactions.*

C12 stated that: *I can receive SMS from my bank about my account and any other important information. This gives me, as a customer, flexibility in interacting and communicating with employees at my bank to know everything with convenience and trust.*

C13 stated that: *I can check my accounts at anytime.*

From these responses, the interviewees believe that m-banking is easy and useful for interacting with their banks and saves them time, because they can use this self-service technology anywhere (for example cafe, meeting, bed and bus) and at anytime. The interviewed Libyans believed that m-banking would be best for Libyan customers because it allows them to always interact with their banks, overcoming the restrictions of the still popular arrangement of in-branch banking using cheque books. As stated previously, the level of penetration of mobile devices in Libya is much higher than general Internet access.

Interviewees were questioned about whether technologies could enhance banks’ interactions with customers. Most respondents agreed that technology adoption has been enhancing their interactions with banking systems, as it has helped banks to conduct their activities more effectively and efficiently. Also, ICT has a strong ability to enhance the experience of interactions with banks. Twelve interviewees [C1, C2, C3, C4, C5, C7, C8, C9, C10, C11, C12 & C13] believed that ICT applications could be a driver for increased interaction opportunities between themselves and their bank.

C8 and C10 were in agreement, believing that ICT adoption could enhance their feelings towards their interactions with their banks.

C1 stated that: *Of course yes, service speed, ease of use and response time for customers leads to positive interactions.*
C3 stated that: *I think the banks, particularly in Libya, need to adopt new technology and be more active in investigating their aims and to enhance relationships with customers.*

C12 stated that: *I think there are some factors it helps, such as employees’ efficiency in interactions and providing quick answers for any questions. Additionally, good skills and a good impression are reflected through my convenience and satisfaction (as a customer). These factors encourage me to continue my dealings with my bank.*

Customers were looking for an improvement in their feelings towards their banks. There were many factors of importance that were identified for increasing the trust and satisfaction of customers, such as a smiling face from the employee in the branch when meeting customers – the interviewees indicated that this leads to increased honesty and trust with their bank. These factors affect customers’ intentions, both encouraging them to continue with a bank and making it more likely they will help to attract other clients.

C5 stated that: *Yes, the interaction with bank’ employees, word of mouth and a smile have a positive effect on me and will let me continue my interaction with my bank.*

To further explore this issue, interviewees were asked an additional question about whether self-service technologies could also enhance their interactions with their bank. Each of the interviewees indicated a preference for one type of technology-based interaction (i.e. Internet banking or m-banking), however this preference varied.

C1 stated that: *The Internet was the first type of technology my bank used and I think it is the best way for me to improve my relationship with my bank.*

C3 stated that: *I think the Internet is better for me because I can use this from my house to guarantee the security and privacy of sensitive information.*

C14 and C8 were in agreement with the statements above, identifying that they believed that the Internet was better because it was quite familiar to them and it had improved their relationship with their bank.
Based on the opinions of the interviewees, Internet banking is a significant improvement for customers of Libyan banks. It has been argued that self-service technologies will also improve customers relationships with their banks because they can be used anywhere and they allow for increased access to information. Interviewees’ responses suggested that they felt similarly; some interviewees said they expected that the accessibility and enhanced detail about the services offered by banks (which is facilitated by m-banking in particular) would lead to better banking decisions. Interviewee C5 stated that he would prefer to deal with his bank through m-banking rather than the Internet.

Traditionally, the Libyan banking sector has placed a great focus on customer recommendations as a means of increasing market share. All of the participants stated that they would prefer to recommend a Libyan bank that used Internet and/or m-banking to others (for example family, friends, colleagues and neighbours). When discussing their bank, they stated that they would discuss the benefits of using self-service technologies based on their experience. Participants perceived these self-service technologies as suitable for all customers and as having advantages beyond the obvious.

There are many reasons for the recommendation of a bank that employs self-service technologies.

For example C5 stated that: *I would provide a recommendation for those applications as result of saving time, enhancing my relationship and the ease of use and speedy to use IT.* C10 listed reasons as: *as those applications have more convince, safety, easy to access and useful way for all.*

C2 stated that it will: *save my time and enhance relationships when I use IT applications with a bank.*

C3 and C12 identified some reasons for recommendation as: a new experience with complete benefits such as quality of service, lower risks (for example, eliminating the threat of the loss of a cheque), and removing the problem of a long waiting time at tellers.
It can be summarized that reasons for the recommendation of banks in Libya that employ self-service technologies are: convenience; safe and suitable applications to conduct banking independently; ease of access to information; and the speed with which transactions can be conducted.

In developed nations, the use of self-service technologies in the banking sector is commonplace. As the Libyan interviewees were living in Australia, they had become accustomed to using these technologies to conduct their banking. In Libya, technology is becoming important for business processes, particularly in banks. A question was asked to explore interviewees’ knowledge about self-service technologies [Internet and m-banking]. The majority of interviewees [C1, C2, C3, C4, C5, C6, C8, C9, C10, C11, C12, C13, C14 & C15] agreed that these technologies created benefits for both banks and customers from the customer perspective.

C1 stated that: The technology is becoming essential for maintaining a modern lifestyle, particularly in economic sectors such as in banks. In addition, the increasing speed of daily business (for example in banks) across many aspects of a business requires businesses to take vital steps and implement suitable procedures to achieve benefits for them.

C2 stated that: For customers, it can increase the degree of satisfaction towards the bank, so those customers never change their account to another bank. This will increase the profits of their bank through their loyalty, and the bank and customers will join to face any competition around the bank. This bank will receive competitive advantages with continuity of services delivery for all clients.

C3 stated that: I think IT can reduce overcrowding and deliver the best services for customers, so it creates customer satisfaction about those goods.

C5 stated that: Exchange information among customers and their bank. Correct any mistakes from a bank to its clients. It allows people to surf a webpage any time anywhere to get information.
C8 stated that: *It is possible to create relationships with technology because it has advantages such as low cost, speed, trust, online quality and safety, and it is easy to use to check my account.*

C11 stated that: *IT provides services 24 hour per days and 7 days per week, so there are no holidays.*

C12 stated that: *The Internet is a great chance for me to manage my money with convince from my home or work office any time. It is easy to transfer money internally or to another country. This is alternative channel for easy money management. It means technology can save customers’ time to finish financial procedures with their bank. Also, banks can create competitive advantage in their local market because they have already achieved customers’ support against competitors.*

From the interviewees’ statements above, we can summarize that self-service technologies have the ability to share benefits between customers and banks. For example, sharing information among customers and banks in the Libyan banking sector will lead to increased trust and the reduction of daily routines and stress for employees in the banking system. ICT applications can enhance customers’ service quality, thereby increasing the number of new customers when a bank provides a high quality and low cost service. ICT applications enable banks to create relationships through the provision of good services to customers, as well as the ability to communicate and correct any errors. ICT therefore has advantages for completing all processes by creating comfortable online interactions for customers with their bank, so it leads to the creation of customers’ satisfaction about those services.

When considering whether there is equality in the benefits afforded by ICT from the customer perspective, twelve interviewees [C1, C2, C3, C4, C5, C9, C10, C11, C12, C13, C14 & C15] agreed that technologies have equal benefits for banks and customers. However, three interviewees [C6, C7 & C8] identified that the application of ICT does not deliver the same level of benefit for both banks and customers. C7 stated that: *This is because the interaction sometimes depends on each employee’s attitude toward using technology in the banking system and
interaction processes. I think in the case of employees having a negative attitude, the customer can get greater benefits than the bank.

The introduction of self-service technologies into banks has created opportunities for the Libyan banking sector. Thirteen interviewees [C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14 & C15] believed that the introduction of self-service technologies to customers would lead to increased benefits for the bank in the form of competitive advantage over other banks.

C12 stated that: *The bank can increase numbers of customers and profits by using IT applications to serve customers and add high value with low cost. The Internet and m-banking are new tools which create ease of interaction between the bank and customers without the need for meeting with dealers or employees.*

C7 stated that: *Those banks can attract new customers and maintain old clients by IT.*

C6 stated that: *It is surely a benefit, yes, because the bank can make arrangements to build relationships with their whole client base and increase investigation of their profits.*

With regard to concerns arising from the use of online banking transaction processes, there were five interviewees [C1, C4, C5, C8 & C12] who believed that banking transactions involving self-service technologies had concerns.

C1 stated that: *I am concerned about new technology coming into the bank system because, for example, I have had experiences where the login for the new technology in my Libyan bank sometimes generates some mistakes when I am using the new applications.*

C5 identified that his personal concerns were stealing money online or poor security (i.e. penetration of the protection of the bank system) and reduced privacy from others if unauthorized logins to his account occurred.

C8 stated that: *I am looking for privacy (data confidentiality) and security of online service because these are key issues in the adoption of IT applications in our bank, especially when I use online bank or m-banking. For example, I worry about issues*
like penetration of the protection system of the bank or stealing money when they log in to my account, I am worried about a breached online security system of my bank and damaged privacy.

C12 identified the concept and types of risks he was concerned about, stating: *Yes, there are many risk factors such as stealing information risk, damage system risk, rules or un-respected risk, technique risk.*

Seven interviewees [C4, C5, C6, C7, C8, C10 & C12] suggested solutions to address the common concerns raised by numerous interviewees. All solutions were related to the bank designing a protection agenda to protect and ensure privacy of customers, and guarantee that interactions are as secure as possible for all customers.

C6 stated that: *I am interested in being able to send or receive an SMS or mobile call when I do anything in my account such as check account or transfer money, to confirm it is correct and this would also lead to keeping in touch with my bank.*

C7 stated: *I will use a complex password to protect the privacy of my account balance.* C8 identified this same method to address his concerns.

C12 stated that: *I prefer to increase the degree of awareness of electronic banking, so all customers know they can be targets and will protect their private information and keep their password strong and secure.*

Interviewees wanted a program with rules to protect their accounts (such as developing a complex password) so increased protection procedures would be in place to address security concerns.

Interviewees’ beliefs regarding any concerns that would affect their long-term relationship with their bank were explored. Ten interviewees [C1, C5, C6, C7, C8, C9, C10, C11, C12 & C14] identified that they had no concerns that would have any real impact on their future relationship with their bank.

C1 stated that: *I believe that my concerns rise when Libyan banks introduce a new technology. These cases always have a rate of risk, but banks should continue to work to reduce the risks that will lead to damage and to misunderstanding of using*
new technology. On the other hand, I think the banks have the ability to safely introduce programs and enhance relations in the long term.

C12 stated that: *I do not think so, because the bank offers speedy solutions for any future challenge with me.*

Customers accept that banks can spend more effort to control risks that will arise in the future, and so most will continue to interact with their bank through the use of self-service technologies. However, C4 had a different concept of the concern and he stated that: *a problem has continued to affect my privacy and trust with my bank, and it certainly will affect my interaction process with my bank in the future.*

The interviewees’ feelings towards the quality of their banks’ websites and banking services was discussed. Thirteen interviewees [C1, C3, C4, C5, C6, C7, C9, C8, C10, C11, C12, C13 & C15] noted that the website and services impacted on their feelings, especially in the areas of adoption, satisfaction, privacy and security.

C8 stated that: *I have positive feelings towards the information, advantages and services which are supplied by my bank, as a result of their good quality website.*

C7 stated that: *I can send my queries to my bank via their website and I can receive answers from them straight way.*

C12 stated that: *The website of my bank has adequate information which relates to loans and money transfers and also other important information for all customers.*

C13 stated that: *Yes, I can, via the Internet, evaluate the quality of a bank’s website and I can comment about the services of a bank based on the information they provide.*

**4.3.5.4 Internet and M- Banking Support Offered**

When a bank introduces new self-service technologies, this can increase their relationship with their customers and potentially increase customer trust, satisfaction and long-term loyalty. It offers an opportunity for a bank to lower costs, increase profits and accomplish a competitive advantage.
Interviewees’ discussed the period of time they had engaged in the use of m-banking for transaction processes. As shown in Table 7.1 above, most participants had used Internet and m-banking for two years or less. This may be largely because Libyan banks are still in the early stages of using ICT and longer is required to establish good offerings and promotion of online services for all customers.

Due to the low level of adoption of Internet services in Libya, it was important to consider how banks that employ self-service technologies could offer support to their customers. For increasing the use of self-service technologies, interviewees were asked about the training that was available. Six interviewees [C4, C7, C8, C10, C11 & C12] believed that banks should provide methods (e.g. guidelines) to improve the customer experience, and provide steps for customers to solve any problems they face when using these self-service technologies. An example of a problem identified by C12 was the loss or expiration of their card. They stated that: Sometimes yes, I lose my payment card or it expires, so my bank has procedures to send a new one and usually sends short messages about the issue of the new card.

Training course were identified by nine interviewees [C3, C4, C5, C6, C8, C9, C10, C14 & C15] as a solution for creating knowledge and experience for the use of Internet and m-banking. Unfortunately, their banks in Libya had not provided this in the cases where the banks had chosen to introduce self-service technologies. The interviewees believed that they were suffering due to a lack of skills for effectively using these technologies.

4.3.6 Chapter summary

This chapter has presented the results from the survey. Initially, respondents’ demographics and technology usage were summarised. A multiple regression analysis to identify whether CL was positively influenced by TA, CS and/or CT was then presented. Table 4.11 below summarizes the results from this analysis.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>R²</th>
<th>Coefficient</th>
<th>Sig</th>
<th>Result</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1-a</td>
<td>PEOU → TA</td>
<td>0.34</td>
<td>0.088</td>
<td>0.215</td>
<td>Not supported</td>
<td>Positive value</td>
</tr>
<tr>
<td>H1-b</td>
<td>PU → TA</td>
<td>0.34</td>
<td>0.561</td>
<td>0.000</td>
<td>Supported</td>
<td>Significant</td>
</tr>
<tr>
<td>H1</td>
<td>TA → CL</td>
<td>0.33</td>
<td>0.330</td>
<td>0.653</td>
<td>Not supported</td>
<td>Positive value</td>
</tr>
<tr>
<td>H2-a</td>
<td>OBQ → CS</td>
<td>0.16</td>
<td>0.409</td>
<td>0.000</td>
<td>Supported</td>
<td>Significant</td>
</tr>
<tr>
<td>H2</td>
<td>CS → CL</td>
<td>0.33</td>
<td>0.433</td>
<td>0.000</td>
<td>Supported</td>
<td>Significant</td>
</tr>
<tr>
<td>H3</td>
<td>CT → CL</td>
<td>0.33</td>
<td>0.280</td>
<td>0.001</td>
<td>Supported</td>
<td>Significant</td>
</tr>
</tbody>
</table>
The results from the multiple regression analysis support a number of the research hypotheses in this study. The analysis confirms that a customer’s Technology Attitude in relation to self-service technologies in the banking sector is not significantly related to his / her Customer Loyalty. However, when such self-service technologies are offered, customers’ perceptions of Online Banking Quality are significantly related to their Customer Satisfaction, which is then significantly related to their Customer Loyalty. Customer Trust is also significantly related to Customer Loyalty.

In practice, this means that if a Libyan bank chooses to employ self-service technologies for their customers, and these technologies are of an appropriate quality standard (such as the level provided by Australian banks and used by participants in this study), then customers are likely to use these technologies and this will ultimately increase Customer Loyalty. The usage rates of Australian banking self-service technologies, as provided by survey respondents, reflect that high quality services are more likely to be adopted by customers, even when those customers do not have a positive Attitude towards technology.

The following chapter provides an analysis of interviews that were conducted after the survey, used to provide further insight into the reasons behind the results that have been highlighted in this chapter.

In recent years, Internet and m-banking have come to be considered highly effective banking services methods because they process many advantages that traditional banking channels cannot offer. These advantages refer to the benefits
that customers can enjoy by using online banking. For example, customers can benefit from a wider range of financial incentives, faster transaction speed, increased information transparency, lower transaction handling fees, higher deposit rates, and extra credit card bonus points (Chi Lee 2009, Chi Lee 2010). The interviewees in this research identified all of these benefits, suggesting that customers of banks are aware of the possibilities available even when their primary bank does not offer and/or promote such services.

The following discussion chapter draws together the results from the surveys and interviews to create a rich picture of customers’ perceptions of the state of self-service technology adoption by Libyans whiles they were in Australia and the potential impact on the Libyan banking sector.
CHAPTER 5: Discussion

5.1 Conclusion of Findings

The literature review established that the Libyan banking sector has a vital role in the development of Libya’s economy. Specifically, this sector is key to the creation of information about potential investment, ICT, trading, risk management and the exchange of goods and services. Each of these functions can influence national savings, and as a result, influence economic growth. Given that the banking sector is vital to overall economic activity in Libya, it is important to understand potential new developments in the banking sector in the area of self-service technologies, i.e. Internet- and m-banking.

This chapter presents a discussion of this research and considers its implications based on the data analysis in the previous chapters. Initially each of the hypothesis used in Chapter 3 are reviewed, and data from the interviews is used to support the findings. This is followed by a review of each of the research questions, highlighting the contributions that this study has made.

The introduction of new technologies in Libya has created a greater number of communication channels between banks and customers, which were expected to have a significant effect on interaction processes and relationships. ICT was expected to reduce the number of face-to-face visits and make relationships more formal across the banking sector. Face-to-face visits in Libyan banks are still perceived as necessary, and the maintenance of these face-to-face visits may actually be reducing the negative effects of the more impersonal methods of ICT-enabled communication. Therefore, while increasing use of ICTs in the banking sector might have an impact on managing relationships; this impact is complex due to the nature of the Libyan context.

The literature found that many of the existing frameworks and methodologies do not sufficiently address all of the requirements for effective ICT performance in the Libyan banking industry. This research provides a feasible framework for implementation of ICT within the Libyan banking sector.
Technology has opened up new markets, new products, new services and efficient delivery channels for the banking industry; Internet- and m-banking are just two examples. As a result, ICT has also provided the banking industry with the ability to deal with the challenges of the new economy. ICT has been the foundation of recent financial sector reforms aimed at increasing the speed and reliability of financial operations and of programs to make the banking sector stronger. As the changes created by these reforms become ‘business as usual’, banks will be forced to continue to grow and adapt their ICT offerings (and the associated support services) to remain competitive.

ICTs has had a positive impact on both banks and customers, improving communications, bringing them closer, and facilitating more open sharing of information. The majority of participants said that the Internet has had a positive impact upon their banks – facilitating customer access to information about accounts, and increasing awareness of challenges. Technology is also perceived as a useful tool for convenient interactions with banks. The Internet was widely used by participants to interact with banks; however, m-banking was more frequently used for traditional banking interactions. These new methods of maintaining relationships are enhancing the accuracy and speed of interactions between businesses and customers. The ICT applications have created value for both the banks and customers.

The ICT revolution has set the stage for a unique increase in financial activity across the local area. The progress of technology and the development of worldwide networks have significantly reduced the cost of global funds transfer. ICT can facilitate banks’ ability to meet the high expectations of their customers, who want on the spot, anytime and anywhere banking facilities.

This research attempted to find out how customer relationships in the Libyan banking sector can become more successful with the assistance of ICTs. ICT-enabled banking services are expected to bring benefits such as improved product and service quality, improved customer trust, satisfaction, loyalty and higher productivity and improved financial services performance. ICT has been widely used to provide accounting and back office solutions to Libyan banks. More recently, this is expanding to include large-scale usage in services aimed at
customers. ICT is also facilitating the introduction of new delivery channels - in the form of Internet banking and mobile banking. The nature of the global banking environment is now such that it is no longer possible for banks to manage their ICT implementations on a standalone basis.

The reasons for customers preferring a particular bank are trust and satisfaction in the bank. This study found a positive relationship between customer satisfaction, customer trust in a bank’s system, and customer loyalty. It has also established that there is a positive relationship between implementation of ICT and delivery of service. This confirms the decision of many banks that are moving to implement ICT-enabled services to deliver better service, ultimately seeking to improve their competitive advantage.

Also supporting this move is the perception of the majority of the participants in this research that technology in the Libyan banking sector has had a positive impact on the way services are supplied to customers. Participants strongly agreed that it is necessary for banks to further implement ICT across their operations.

The perception of a positive customer relationship constitutes a great asset and an important competitive advantage for banks offering Internet and mobile services. As a result, these banks should be able to enhance the positive relationships built and use them for their advantage. This requires a clear vision of how to sustain these relationships and make the best use of them. The customers’ benefits obtained by using these services (for free) also benefit banks, because they are able to gather data automatically from these interactions as well as collect customer feedback about the interaction experience. As a result, it is vital that the technology service providers supporting banks in this delivery have a clear image of how to manage such neutral relationships and adapt them to the advantage of the banks. It is also important that the service provider is able to examine the overall market values and examine potential forces that can affect consumer perceptions towards accepting and using the mobile services offered.

Our findings revealed that PU has a positive relationship in determining intention to adopt Internet- and m-banking in Libya. This result shows that m-banking is useful and beneficial, and that users are more likely to adopt m-banking services than
Internet banking services due to the high uptake of mobile devices, and hence their accessibility. Therefore, banks should highlight the benefits of cost savings, flexibility, and mobility offered by m-banking services. Also, banks should educate users about the benefits of using such banking services. It is expected that the there will be a duality exhibited in the benefits – banks provide more useful services to customers; customers use these services and benefit in time and convenience; banks are able to enhance customer loyalty as well as collecting data that feeds into continually improving service offerings.

With regard to the preceding discussion, the following conclusions could be drawn.

- There has been little research done into the use and/or contribution of ICT to the banking sectors of developed countries such as Libya.

- The level of ICT improvement in the banking sector will directly impact the degree to which the banks’ customers are satisfied. Customers are generally not pleased with bank transactions that require a lot of time for completion or involve time long queues. Against this background, a bank that has an effective ICT infrastructure (e.g. quick money transfer systems and efficient banking systems) will reduce the complaints received and consequently increase customer satisfaction levels.

- There is no existing published study that has focused on the dimensions from this study together, and tried to measure the effect on customer loyalty. This thesis has provided a new model that suggests seven factors as dimensions of relationships among customers and the banking industry in Libya. These factors are: perceived ease of use, perceived usability, technology attitude, online banking quality, customer satisfaction, customer trust, and customer loyalty. It is the strong offerings of Internet- and mobile-banking that have provided the ability to capture and exchange useful banking information through the privacy, convenience, security, usability and feasibility of delivering personalized services. Together, these benefits enhance customer loyalty.

- In general, the profile of users in Libya overall reflects the characteristics of earlier adopters of technology. The findings of this study are of significant
value in understanding the nature of the emerging market and the opportunities for the banking sector. Given the global nature of the banking sector and the market dynamics of the Libyan banking sector, the provision of Internet- and m-banking in Libya is no longer sufficient for achieving competitive advantage. Therefore, banks must better understand their customers’ needs and respond quickly with vital strategies to market developments in customer-centric ways.

- The application of technology to customer relationship processes is continuing to change the way banking business is done. Internet- and m-banking can create many advantages for Libyan banks, but banks must first acknowledge e-banking as a new delivery channel for services. Implemented successfully, it can lead to a large amount of automated transactions. Ultimately, it is likely that the banks’ systems may need to be completely restructured to address this changing approach customer interaction and relationship management. ICT applications may increase the efficiency of the banking sector system by reducing both customers’ and banks’ banking costs. One of the main reasons for the growth of Internet- and m-banking is that it can significantly lower the cost of delivering products and services. The results of this study showed that the customers also strongly support Internet- and m-banking in Libya. However, with banking customers growing increasingly comfortable with ICTs, their expectations from financial service providers are significantly transforming and banks must offer the Internet-enabled services to meet these needs.

It is believed that a strong banking industry is important in every country, and that it can have a significant effect on economic development through efficient financial services. Libyan banks have been working to quickly introduce modern banking technologies and Internet- and m-banking services in recent years. Almost all banks have invested in expanding and improving their ICT systems and a number of new low-level Internet- and m-banking services have been developed. All banks have declared e-business as one of their core strategies for future development. While these offerings are continually increasing, acceptance from customers depends largely on banking service quality, which impacts on customer satisfaction.
This research found that trust and satisfaction are seen as major contributors to loyalty. The results of this study indicate the importance of including trust-building measures into online customer relationships. For example, consumers who have a high degree of trust in an Internet- and m-banking provider are more likely to become a loyal customer with that bank. Therefore, Internet- and m-banking services need to create a trusting relationship with customers by providing ‘honest’ (i.e. comprehensive and accurate) information and being ‘helpful’ to their customers (i.e. by providing the services and functionality in a usable and reliable manner).

5.2 Demographics, Technology Use and Experience

This section presents a review of the participants in both the survey and the interviews. For the surveys, respondents were predominately male (73.8%). The majority of interview respondents were also male (80%). Social and cultural characteristics of Arab societies differ from those of the West. Libya considers itself as a country where Arabian cultural values are dominant; it is distinctly tribal and conservative in its loyalty to Islam. Therefore the high percentage of male participants was expected in this study, as Libya is a male dominated country. Despite this gender bias in participation rates, when the data was examined based on gender there were no statistical gender-based differences in participants’ perceptions about using self-service technologies in the banking sector.

In a previous study on the banking sector in the Arabic region, Twati and Gammack (2006) employed a survey that had 78% male respondents and 22% female respondents – a similar breakdown to this study. Joshua and Koshy (2011), Emzio (2010), Al- Suker (2005) and Roses et al. (2009) also all had a higher percentage of male respondents, however these studies identified that males have a greater preference than females for using e-banking services. In contrast, this study identified that both genders had similar perceptions towards self-service technology adoption and use in the banking sector.

Most of the participants in both the survey and the interviews were aged below 34 years (52.5% of survey respondents and 60% of interview participants were in the 25-34 years age group). This demographic grouping may have been due to the
convenient sample population used in this study (i.e. Libyans who were living in Australia, most of whom were studying at university). These age demographics are similar to the sample used in Ab-Hamid (2006) and Roses et al. (2009). With respect to the level of education of the participants, all were highly educated, as was expected due to the convenient sample population of the research. For the survey, 37.6% of respondents had postgraduate university degrees. 93.3% of the interviewees were engaged in postgraduate studies. The responses supported the literature that claimed highly educated customers have more widely adopted self-service technologies within the banking sector (for example, Joshua and Koshy (2011), Malhotra (2011) and Malhotra and Galletta (1999)). Additionally, educated consumers tend to have higher requirements of service in their quest for trust and satisfaction and seek more advanced quality services than less educated users.

As the respondents were currently living and studying in Australia at the time of their participation in this research, they had all had experience using ICT applications and had the ability to engage with banks and their self-service technologies. All of the participants used the same bank in Australia (the Commonwealth Bank of Australia), a leader in the provision of these technologies. The time spent time in Australia by the participants ranged from one to nine years. 54% of participants in the survey had spent at least one year living in Australia as students. Most had experience using ICT applications in both Libya and Australia and were therefore accustomed to modern technology.

The demographics and technology use analysis of the participants found that this younger generation of Libyans, who were students studying to further their education, were more likely to adopt newer technologies. These are individuals with the potential to drive self-service technology adoption in the banking sector on their return to Libya. Prior research has supported this argument, identifying that the younger generations are usually more interested in adopting ICT applications than older generations (Al-Sukkar 2005, Twati and Gammack 2006, Twati 2007, Twati 2008, Joshua and Koshy 2011).

Considering the technology use of the participants, the following points can be stated based on the sample:
• There was greater use of most technologies in Australia compared to Libya by the participants in the survey. This trend was particularly clear for mobile phone usage. The traditional fixed phone was the exception to this (63% users in Libya compared to 39% users in Australia).

• When in Australia, 100% of the survey respondents used the Internet.

• The use of banking at the traditional teller was higher when the survey participants were in Libya compared to in Australia. The interviews identified that participants’ level of English was a reason for this reduced level of using tellers, and avoidance of face-to-face interactions was facilitated by the availability of self-service technologies.

• The availability of self-service technologies in Australia meant that the survey respondents used the technology despite their attitude to technologies.
  
  o ATMs used by 13% respondents in Libya compared to 96% respondents in Australia.

  o Phone banking used by 8.5% respondents in Libya compared to 34% respondents in Australia.

  o Internet banking used by 4% respondents in Libya compared to 83.6% respondents in Australia.

  o Mobile banking used by 9% respondents in Libya compared to 32.6% respondents in Australia.

Participants stated that greater experience with the use of self-service technologies will lead them to demand greater access to Internet- and m-banking services on their return to Libya. They identified that consumer loyalty depends most significantly on reliability of services, identifying ‘Online Banking Quality’ as a key construct in loyalty to a particular bank. As they have become more experienced consumers, they now have higher expectations of service from their banks for them to be satisfied in the service offered. Prior research in literature has suggested that more experienced users are less likely to be satisfied with services
that are not differentiated from other offerings, and hence they are less loyal (Meutera et al. 2003, Clemes et al. 2011). With Libyan banks improving their overall customer experience through the use of self-service technologies, it should be possible to enhance overall customer perception of the relationship with their bank.

Customers’ experiences with a technology influence their awareness of similar technologies and hence can increase (or decrease) their intention to adopt the technology. Libyan banks have the potential to create a positive attitude towards their customers through increased adoption of Internet- and m-banking. This can increase relationship quality, trust and satisfaction, and promote the value of the banking services (Al-Majali 2011). The results from this study also indicate that customer loyalty is affected by the level of experience a customer has with different ICT tools.

5.3 The Theoretical Model

Examining the structural model developed for this research enabled an assessment of how much variance in the dependent variable(s) of the model could be explained by the independent variables. The proposed model explains 34% of the total variance in customer attitudes towards ICT adoption and use in the banking sector. Examination of the structural model also allows the examination of various paths in the research model. Each structural path in the research model represented a proposed hypothesis. The analysis of the structural model resulted in the confirmation or rejection of each hypothesis as well as comparisons of the impact of various independent constructs on the dependent variable customer loyalty.

The model proposed in this study employed seven variables: six independent variables (Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Technology Attitude (TA), Customer Trust (CT), Online Banking Quality (OBQ), and Customer Satisfaction (CS)) and one dependent variable (Customer Loyalty (CL)). All of these variables have Cronbach’s alpha values of reliability above 0.60, identified in the literature as satisfactory (Safeena et al. 2010, Al-Majali 2011, Safeena et al. 2011). The correlation matrix is presented in Table 5.1 below.
Table 5-1: Cronbach Alpha, Correlation matrix and extraction of dimensions of relations

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<th>Items</th>
<th>Cronbach's Alpha</th>
<th>Correlation Matrix value</th>
<th>Extraction</th>
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<tr>
<td>PU</td>
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<tr>
<td>PEOU</td>
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<tr>
<td>TA</td>
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<td>0.198</td>
<td>0.768</td>
</tr>
<tr>
<td>OBQ</td>
<td>0.806</td>
<td>0.409</td>
<td>0.659</td>
</tr>
<tr>
<td>CL</td>
<td>0.640</td>
<td>0.527</td>
<td>0.547</td>
</tr>
<tr>
<td>CT</td>
<td>0.655</td>
<td>0.399</td>
<td>0.606</td>
</tr>
<tr>
<td>CL</td>
<td>0.849</td>
<td>1.000</td>
<td>0.526</td>
</tr>
</tbody>
</table>

The Kaiser-Meyer-Olkin (KMO) statistic is used as a measure of internal scale consistency for all the variables in the study. In this research the KMO statistic was 0.748 which indicates that factor analysis can proceed, and rejects the hypothesis at $p < 0.001$ that the correlation matrix is an identity matrix without significant correlations between variables. These results indicate that a construct has logical internal consistency and significantly high reliability.

The hypotheses of this research were suggested as part of the solution to the research questions of this study. This section will provide an explanation of the hypotheses tested with the model, using supporting evidence from the interviews.

### 5.3.1 Perceived Ease of Use $\rightarrow$ Technology Attitude (H1-a)

Hypothesis H1-a is tested the correlation between PEOU and TA in the Libyan banking sector. The results indicated that PEOU was not significantly correlated to TA ($b = 0.088$, $t(138) = 1.247$, $p = 0.215$), indicating no relationship between the variables. Similar studies in the literature reached the same conclusion and identified that PEOU was not related to the adoption of Internet- and m-banking (Chen et al. 2007, Brown 2008, Chi Lee 2009, Yaghoubi and Bahmani 2010, Ying and Can 2010, Cheah et al. 2011).

A review of the responses from the interviews indicated that the interviewees perceived that banks did not offer special training courses for customers to make the self-service systems easier to use. Nine interviewees stated that banks were still suffering from a lack of many skills including communication, innovation and customer service. Two interviewees further identified that they were unable to discuss their feelings with their bank with regard to the use of technology.
Banks should provide sufficient information and clear guidance to encourage users to use self-service banking technologies. One interviewee noted that customers could be assisted through a demonstration of how to use m-banking services on the bank’s website. Another interpretation is that difficulty in using Internet- and m-banking systems is becoming less of a concern in developed countries as they are increasingly user-friendly. Since they are more common, customers have become increasingly competent in using them (Chi Lee 2009). After respondents in both the survey and interviews being exposed to a developed country’s technologies, they expected the same level of service on their return to Libya.

10 of the 15 interviewees discussed that, in a developing country such as Libya, there are many types of risks to be concerned about. For instance, stealing information, damaged systems, and technical failure are all of great concern. Libyan customers are notably concerned about new technologies related to banking systems because they have experienced mistakes related to the login process. Such mistakes have the potential to result in online money theft, generally poor security and damaged privacy. Customers are seeking privacy and security in online services; they perceive these as key issues in the adoption of ICT applications by a bank, especially when they use self-service technologies.

5.3.2 Perceived Usefulness → Technology Attitude (H1-b)

Hypothesis H1-b tested the correlation between PU and TA in the Libyan banking sector. The results indicated that PU was significantly correlated to TA ($b = 0.561$, $t(138) = 7.994$, $p < 0.000$) indicating a significant relationship. There is evidence from the survey that customers identify technology as a useful method for interacting with the banking sector. From this study it can be argued that PU is more influential than PEOU in explaining the acceptance of Internet- and m-banking in the Libyan banking sector.

The interviews also showed that Internet services are generally perceived as useful by interviewees, but their level of usefulness is dependent on the specific task that the customer intends to accomplish. Interviewees expressed that customers see more usefulness in mobile services for providing immediate answers and performing simple tasks that can save time and effort. Also, three interviewees
explicitly stated that they had no difficulty using Internet banking, finding it a very useful method of interacting with the bank.

The results from this study suggest that PU has a significant effect on TA to use Internet- and m-banking. Similar results have been identified in the literature, for example Al-Somali et al. (2009) identified this in the Saudi Arabian banking sector, Tingrari and Abdelrahman (2012) in the Sudanese banking sector, and Nasri and Charfeddine (2012) in the Tunisian banking sector. Pikkarainen et al. (2004) and Yaghoubi and Bahmani (2010) indicated that PU had both direct and indirect influences on attitudes and intentions toward system use. Chi Lee (2009) concluded that PU was more powerful than PEOU in explaining the acceptance of Internet banking; other studies in the literature reached the same conclusion (Chen et al. 2007, Yaghoubi and Bahmani 2010, Ying and Can 2010).

Players in the Libyan banking sector need to highlight the benefits of using Internet and mobile self-service technologies, for example cost savings, flexibility and mobility. Banks can educate customers about the benefits of using Internet- and m-banking services through a promotional mix, including personal services and e-advertisements. By providing more useful services, customers will be more inclined to adopt Internet- and m-banking (Cheah et al. 2011). Both the survey and interview results of this study supported the proposed relationship between PU of ICT applications and the intention to use ICT to create relationships and serve those customers.

5.3.3 Technology Attitude → Customer Loyalty (H1)

It was hypothesised that the technology attitude of bank customers in relation to using self-service technologies is affected by their perceived ease of use and perceived usefulness of the technologies. However, only PU was found to be a significant predictor of TA.

Hypothesis H1 tested the correlation between TA and CL in the Libyan banking sector. The results indicated that PEOU was not significantly correlated to TA ($b = 0.033$, $t(137) = 0.450$, $p = 0.653$), indicating no relationship between the variables. This is a similar result to that reported in a study by Brown (2008).
Five interviewees did not value or feel they exhibited CL for their banks. Interviewee C12 stated that: *I cannot classify myself as loyal with this bank because it does not have a clear plan or strategy for technology interaction with me.* This statement demonstrates that when the bank does not exhibit a clear attitude towards technology then some customers will potentially take their business elsewhere.

### 5.3.4 Online Banking Quality → Customer Satisfaction (H2-a)

Hypothesis H2-a is tested the correlation between OBQ and CS in the Libyan banking sector. The results indicated that OBQ was significantly correlated to CS ($b = 0.409$, $t(139) = 5.284$, $p < 0.000$), indicating a significant relationship. There is evidence from the survey that customers identify OBQ as a key element in CS. OBQ includes the quality of online information and the relationship a customer receives from their bank, and it also includes product and services quality.

Five interviewees identified that, as customers, they had received quality service from their bank in Libya due to a strong level of competition in the local marketplace. The interviewee C2 discussed how electronic methods of banking enabled reduced stress when they were at a branch. This was the result of the bank’s customer-focused support system enabling the sharing of critical information rather than using traditional manual means.

The quality of the content provided by the bank to the customer has a high level of significance, as information quality is the heart of the banking sector. Information quality characteristics include measures such as accuracy, relevancy, comprehensiveness, timeliness and preciseness of the information provided (Deng et al. 2010). It is also important to identify how the information is presented by banks to their customers through the use of self-service technologies, as this information can be controlled by users. The quality of publically available information, particularly the relevance and accuracy of information on a bank’s website, is another important element that banks should be concerned about. A website that displays information that is out-of-date will be viewed by customers as inefficient (Liu and Arnett 2000). As the Libyan banking sector moves to have greater amounts of information available to customers through self-service technologies, information quality should be at the forefront of any decisions by a
bank. The concept of quality is very closely related with customer satisfaction and it has a positive effect on customer satisfaction. This idea has been supported by this study. Studies by Ahmed and Amir (2011) in the Pakistani banking sector and Clemes et al. (2011) on the banking sector in general noted that banks’ service quality was related to customer satisfaction. This research concurs, with findings further supported by findings from similar studies in the literature by Yen and Gwinner (2003), Deng et al. (2010) and Eid (2011). As OBQ is related to CS, accurate publically available information will have a positive influence on the Libyan banking sector.

This study has concluded that OBQ can be improved in the Libyan banking sector through bank provision of accurate and timely information, efficient customer service, high quality products and services and an easy to use website.

5.3.5 Customer Satisfaction \( \rightarrow \) Customer Loyalty (H2)

Hypothesis H2 tested the correlation between CS and CL in the Libyan banking sector. The results indicated that CS was significantly correlated to CL \( (b = 0.433, \ t(137) = 5.587, \ p < 0.000) \), indicating a significant relationship. The analysis of the survey results from this study shows that CS has a strong relationship with CL. This identifies that the participants perceived that the Libyan banking sector wants to make their customers satisfied and loyal, as when customers are satisfied with the services of their bank they will continue to interact with that bank.

The benefits of a satisfied, and thus loyal, customer base were highlighted by the following points raised in the interviews:

- Interviewees where impressed when services exceeded their expectations, largely facilitated by the convenience of self-service enabled banking.

- Interviewees identified that providing a quality service allows expectations to be met when transferring money, receiving bank statements and conducting payments.
• Interviewees were reassured by the provision of accurate and detailed information about their queries with relation to privacy and security of conducting business online.

Prior research has identified that a customer’s CL will increase due to a deep feeling of satisfaction with their current banking provider (Deng et al. 2010). A study by Siddiqi (2010) identified that a small increase in customer satisfaction leads to a dramatic increase in customer loyalty. The strong positive correlation of customer satisfaction with customer loyalty means that a bank’s satisfied customers will recommend their bank to other people (e.g. friends, neighbours, family members); this result was highlighted by interviewees. As a benefit of a strong level of CL, a bank can have a loyal and stable customer base that acts as a promotional tool, thus reducing the cost of seeking new customers.

5.3.6 Customer Trust → Customer Loyalty (H3)

Hypothesis H3 tested the correlation between CT and CL in the Libyan banking sector. The results indicated that CT was significantly correlated to CL ($b = 0.260$, $t(137) = 3.549$, $p = 0.001$), indicating a significant relationship.

An analysis of the interviews identified that customers who do not trust a bank’s ability to provide secure and private Internet- and m-banking experiences will not be loyal to that bank. From the survey and interview responses, it is believed that a higher level of trust results in higher loyalty towards banking services.

A previous study by Yee et al. (2010) found that trust had a positive effect on CL. This result was supported by the findings of studies by Eid (2011) (in the Saudi Arabian banking sector), Deng et al. (2010), and Auraskeviciene et al. (2010), all of whom concluded that CT had a positive effect on CL.

According to a study by Tzer Liu et al. (2011) in Taiwan, trust is an important mediating factor of customer behaviour before, during and after purchasing a product. It can lead to long-term loyalty and strengthen the relationship between the banks and customers. Customers who trust their bank are more than likely to be loyal to that bank. Consequently, when customers trust their service provider, they will continue using the services and may recommend the services to others.
5.4 Addressing the Research Questions

Chapter 1 identified the research questions to be addressed by this research. This section discusses the progress of the study towards answering these research questions to meet the objectives of the research. The main purpose of this study was to understand and improve Libyan banks’ approach to the use of ICT applications to create and maintain customer relationships. This study argued that there would be a significant improvement in creating customer relationships using ICT.

The following questions are addressed below:

1. How does the use of ICT in the Libyan banking sector influence the establishment of relationships with new customers?

2. How does the use of ICT in the Libyan banking sector influence the maintenance of relationships with existing customers, and specifically, how does it impact on customer loyalty?

3. How does the use of self-service ICT in the Libyan banking sector influence experiences of service delivery and relationships with customers?

4. How does prior exposure to self-service ICT banking in developed nations influence customers’ expectations of and engagement with ICT in the Libyan banking sector?

5.4.1 Addressing Research Question 1

The first research question investigated to what extent ICT has the ability to help the Libyan banking sector to create and support long-term customer relationships in Libya through the use of Internet- and m-banking with potential new customers. This question is aimed at understanding whether a participant would be willing to change banks (and potentially not be loyal to their current bank) if another provider employed better use of ICT.

The suggestion is that the relationship between a bank and its customers is important because of the potential offered by the adoption of ICT for both internal
and customer facing processes. This has not been adequately addressed in prior research, which has largely had a focus on banking in developing countries. Understanding this relationship is also of great practical importance to other service providers who must maintain good relationships with customers to retain local business. Achieving a better understanding of the factors that positively affected the quality of a relationship with a customer will allow a service provider to make the most of their advantages.

In the Internet- and m-banking context, there is a relational element between banks and customer through self-service technologies that makes the adoption process quite different to the implementation of previous banking service channels. 14 out of the 15 interviewees identified that the Internet offers a better and easier tool for developing and then sustaining long lasting relationships. Customers can use Internet- and m-banking from home to access information and conduct transactions. However, it was identified by some of the interviewees that both new and established customers need to accept the potential security and privacy issues associated with using Internet- and m-banking. Therefore trust in the bank that the customer uses along with the bank’s ability to protect customer information is of importance in the development of the relationship with bank.

Eight interviewees identified that they believed that there future relationship with their bank is positively influence by their bank mitigating risks with the adoption of future ICT developments. As this risk mitigation approach is publically stated (e.g. use of secure Internet systems), new customers are willing to interact with these banks. In addition, participants believed that ICT applications are convenient, safe and suitable for all customers because they provide easy access to their account and allow fast financial transactions. These are all potential features that can create a positive relationship between customers and their new bank.

This study identified that Internet- and m-banking will offer certain advantages over traditional banking methods, confirming previous research. For example, Roses et al. (2009), also identified advantages such as time saving, convenience, accessibility, security and safety). By a bank employing ICT more broadly, and particularly being concerned with customer focusing technologies, new customers will be willing to engage with that bank.
5.4.2 Addressing Research Question 2

Maintaining relationships with existing customers is important, particularly in situations where there is value in both the business and the knowledge that might emerge from these relationships. Knowledge from relationships is particularly vital when products or services that are exchanged in the bank-customer interaction can be customized or are complex. This is so because customizable products or services require more information to be interchanged between the customer and the bank; having an ICT-based banking system that can support this relationship is critical for success. When the effort and cost involved in the maintenance of the bank-customer interaction is reduced by ICT, this is of benefit for the bank.

One way that ICT influences the customer relationship is through open information sharing. This thesis has identified that ICT has the ability to mutually share benefits between customers and banks. For example, open sharing of information will lead to increased trust and reduction of daily routines and stress for employees. ICT can also enhance customer service quality, so it can increase the number of new customers when the banks provide high quality and low cost services that are beneficial to customers. Nine of the interviewees identified that their bank provided them with the best services and useful information through ICT applications.

All of the interviewees identified that they would recommend Internet- and m-banking to others. Fourteen interviewees went further, stating that a bank could improve their relationship with all customers and increase the depth of interaction by increasing their adoption of self-service technologies, and those banks can obtain new customers and maintain old customers through having systems that promote trust, satisfaction and loyalty. The respondents believed that with this greater use of ICT, banks could find efficiencies and reduce costs, increase profits and achieve a competitive advantage.

Customer loyalty programs are aimed at maintaining long-term customer relationships. These have a positive impact on a bank’s performance because loyal customers have higher repurchasing behaviour (Jayachandran et al. 2004). Those customers do not change their account to another bank and they increase bank profits through their loyalty, helping the bank to face competition. The bank also
achieves competitive advantages through continuing services delivery for all customers at the same time. The results from the model used in this study confirm that loyalty is directly affected by customer trust and customer satisfaction with the quality of online banking systems. This thesis recommends that trust-building programs are concurrently rolled out with any new self-service technology. This is one program that is seen as helpful in increasing customer acceptance.

5.4.3 Addressing Research Question 3

ICTs facilitate connections and the ability for communication between banks and their customers (Wamalwa 2006). ICT is an essential element for increasing customer relationships because it can be used to improve customer service strategies in several ways such as the transformation of services and products to meet new customer demands, and ICT tools being implemented to increase interaction with customers (Wells et al. 1999). Interactions with ICTs will reflect directly on customers’ decisions about banking services. Kardaras and Papathanassiou (2000) suggested that the Internet can provide businesses with a cheaper way to perform activities and to access customers’ views and positions about products and services.

This research suggests that self-service should be considered by the Libyan banking sector as a technique to improve the customer experience by providing a greater range of services. The current customers’ experience of interaction with ICT should be considered and understood by banks to enhance their overall awareness of the types of relationships, ultimately enabling customers to feel more comfortable with the technology.

In addition, the results of this study also indicate that consumer loyalty is affected by ICT users’ experience level. More experienced users are less likely to be satisfied with services that are not differentiated and are less brand reliant, and hence are less loyal. The suggestion that experience level influences trust, satisfaction and loyalty finds support in this study. The results show that more experienced users of self-service technologies require banks to offer higher quality services to satisfy them and gain customer loyalty (Ab-Hamid and Kassim 2004, Ab-Hamid 2006).
ICTs can increase the experience of new customers in receiving available services that are usable when, where and for whom they are required; as a result, ICTs may improve the customer relationship and enhance satisfaction by increasing the current value of existing services and the creation of new self-service strategies. Of the participants who had used Internet- or m-banking, 55.3% had used these ICT applications for less than one year and 18.4% for less than two years. The percentage of respondents who had used the Internet and mobile devices (for any purposed) for more than four years was only 11.4 %. This lack of experience across the Libyan population is important for banks to understand, so that the applications developed are usable and also appropriately supported.

ICT tools have been used in developed countries for many years, and have demonstrated their potential for significantly altering the Libyan banking sector in the future. A study by Costello and Tuchen (1998) identified that ICTs were used to facilitate communications in the Australian insurance sector as early as 1998; these ICTs included self-service technologies such as email, electronic mediums and the Internet. These tools have created the potential for changes to banks’ delivery of products for customers, and as a result ICT creates market wide accessibility to service face-to-face customers. A number of the tools used in ICTs (such as mobile phones, e-mail, Internet- and m-banking) will together likely change the future of Libyan financial institutes and customers. Self-service technologies seek to move processes towards individual customers (Leek et al. 2003) and facilitate the provision of better products and services at lower prices (Chesher and Linton 2003). Thus, self-service technologies are significant in reducing costs and increasing flexibility in the interaction process between a bank and its customers.

According to data analysis of the participants, Australian banks had greater use of technologies than Libyan banks. This was largely due to the fact that these banks had been making decisions to use these technologies for a number of years and they have had enough time to develop a good understanding of their benefits and achieve a greater level of acceptance by their customers. Additionally, with their experience in developing self-service technologies, the respondents stated that the Australian banks services were easy to use, easy to get assistance, and quite accessible. However, in Libya, where such experience was lacking, issues relating to Internet-
or m-banking are normal, particularly with regard to their use (Al-Hajri and Tatnall 2008). Given the presence of third party providers of self-service banking systems and learning from more advanced countries, Libyan banks do not need to develop these systems from the ground up.

Customers are sensitive to a good first-time experience when using self-service technologies; this will lead to a positive attitude and willingness to continue use. The discussions in the interviews suggested that if customers have positive experience with ICT they will have a positive attitude toward the applications and actually use it. This is because a customer with ICT experience will become more confident and thus increase their expertise in using ICT applications and have the ability to access a greater number of banking services. However, more experience leads customers to ask for more value from the banking sector. This is probably because experience helps reduce the cost of searching for alternatives.

This study’s findings have important implications for banks using ICT applications in Libya. They should support Libyan banking staff to better understand what key aspects of ICT applications they must focus on to improve customer satisfaction and their services. Effective ICT has become absolutely necessary to support customer relationships. ICT has changed the business process of banks and the way they operate. The result of this is that banks can offer benefits to customers such as better management of relationships and increased availability of information.

5.4.4 Addressing Research Question 4

This research question considers areas that Libyan banks should focus their attention on when reviewing the technologies that they are implementing; previous research (Twati 2008) focused only on the low level of ICT adoption in Libya. These results are of interest as they show that a technology that is taken for granted in Australia, such as the ATM, is not available to a large majority of Libyans when they bank in Libya.

A review of the website of a major Libyan bank that identifies itself as the first bank to provide online banking services, Commerce and Development Bank, states that it has 16 ATM located across Libya and 22 sites that use Point of Sale (POS) machines (Bank of Commerce & Development 2013). The level of access
and adoption of these technologies is extremely low in Libya compared to in Australia (a developed nation where nearly all businesses have a POS machine and ATMs are considered ubiquitous in commercial settings).

The results also show that traditional face-to-face interactions with a bank teller (used by 75% participants in Libya compared with 53% participants in Australia) are used less by Libyans when other technology-enabled services are available.

### Table 5-2: Banking changes between Libya and Australia

<table>
<thead>
<tr>
<th>Items (Libya: Australia)</th>
<th>ATM</th>
<th>Phone banking</th>
<th>Internet banking</th>
<th>Mobile banking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Don’t:Don’t</td>
<td>31</td>
<td>85</td>
<td>21</td>
<td>88</td>
</tr>
<tr>
<td>Don’t:Do</td>
<td>4</td>
<td>44</td>
<td>114</td>
<td>40</td>
</tr>
<tr>
<td>Do:Don’t</td>
<td>35</td>
<td>8</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Do:Do</td>
<td>71</td>
<td>18</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 5.2 above shows how survey respondents have changed their use of the major five different means of conducting banking. A review of the relevant survey responses identified that, for surveys where data was missing, the participant either did not use that banking service or perceived that the banking service was not available to them. Therefore, ‘Missing’ responses are recorded as ‘Don’t’ in Table 5.2.

- The Don’t:Don’t row indicates the participants who did not use the service when they were in Libya or when they were in Australia.
- The Don’t:Do row shows participants who did not use the service in Libya but have adopted the service in Australia.
- The Do:Don’t row indicates the participants who used the service while they were in Libya but do not use it in Australia.
- The Do:Do row indicates the participants that use the service both in Libya and Australia.

From Table 5.3, below shows an increase in the adoption of self-service technologies while the participants were in Australia can be seen. To analyse whether these results showed any significant changes in participant use of self-service technologies between Libya and Australia, a McNemar Chi-squared test was conducted.
Table 5-3: McNemar Chi-squared test on banking changes

<table>
<thead>
<tr>
<th>Items</th>
<th>Chi-squared</th>
<th>df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the teller</td>
<td>23.077</td>
<td>1</td>
<td>0.000**</td>
</tr>
<tr>
<td>ATM</td>
<td>113.076</td>
<td>1</td>
<td>0.000**</td>
</tr>
<tr>
<td>Phone Banking</td>
<td>23.558</td>
<td>1</td>
<td>0.000**</td>
</tr>
<tr>
<td>Internet Banking</td>
<td>106.216</td>
<td>1</td>
<td>0.000**</td>
</tr>
<tr>
<td>Mobile Banking</td>
<td>21.787</td>
<td>1</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

* p < 0.01

Table 5.3 above shows the results of the McNemar Chi-squared tests conducted on the data from Table 5.3. The tests all show significant changes in participant use of all of the self-service technologies. For the ‘at the teller’ service (a traditional face-to-face service), a significant decrease in the use of this service was shown by the result. This could be due to a number of factors, from language issues (English is not the participants’ native language) to geographic boundaries. For the self-service technologies (ATM, phone, Internet- and m-banking), the significant difference occurred in the direction of increased adoption of the services when in Australia (a developed country). The increased level of adoption could be attributed to:

- The increased availability of the banking self-service technologies to the participants,

- The increased level of general Internet access (as all the participants were in Australia under Student Visas, it would be expected by their educational institutions that they could use this technology), and / or

- That it was easier for participants to interact with self-service technologies compared to ‘at the teller’ due to language and geographic issues.

As customers increase their self-service technology experience, they develop expectations and perceptions regarding the efficiency of this service delivery method (e.g. saving time and increasing speed), expecting more from it than the full-service alternative. This relative advantage helps the customer to believe they have the ability to perform their banking using self-service technologies. Consequently, consumers build confidence and are more willing and able to move through the menu options on the use of self-service technology screens in order to focus on the target service. It is believed that self-service customers prefer efficiency options and increased banking operations control (Sannes 2001).
When customers’ expectations are satisfied, they experience the perceived values of safety and security as part of their banking relationship, which together increases trust and then enhance customer loyalty. Customers’ expectations regarding costs and benefits of the relationship mainly depend on past experiences, and engaging in satisfying experiences increases their motivation and the possibility that customers will maintain that relationship.

5.5 Chapter summary

The literature shows that the customer relationship dimensions include two or more factors in the banking sector. For example, a previous study by Afsar et al. (2010) in the banking industry of Pakistan provides the factors of perceived quality, satisfaction, saving cost, trust and commitment that influence customer loyalty. The literature reported another model with the dimensions of playfulness, services quality intimacy, satisfaction, trust and switching barriers to address the same customer loyalty issue (Tzer Liu et al. 2011). Another study by Hui Lin and Wang (2006) defined customer loyalty based on perceived value, satisfaction, trust and habit.

Studies by Al-Hajri (2008), Al-Hajri & Tatnall (2008) and Al-Hajri & Tatnall (2008) identified three dimensions of customer loyalty: customer search cost; barriers to entry and distinctiveness of the bank. Customer loyalty (in a general sense) has been presented in research frameworks in the literature previously, and online customer loyalty leads to many of the advantages identified in these generic frameworks, such as reduced costs, more new customers and increased competitive advantages (Luarn and Hui Lin 2003).

Wong (2005) identified that trust and satisfaction were the first steps necessary to encourage customer loyalty. The links between customer loyalty and both trust and customer satisfaction are significant, and the link between customer loyalty and satisfaction is greater than that of customer trust (Flint et al. 2011).

Further investigation of these links was sought through interviews. The qualitative data strongly and clearly confirmed the impact of PU and PEOU on TA. In the interviews, all participants stressed the important influence that the quality of their
relationship with the Internet and mobile service provider has on their attitude towards accepting ICT. The interviewees identified the role that ICT plays to support relationships between banks and customers. These findings further highlight the results of previous studies that investigated the critical impact of relationship quality, as perceived by CS, on CL and a bank’s success.

In the interviews, 14 out of the 15 participants identified that, through quality relationships and service interaction, self-service technologies give greater benefits (such as lower costs), increase profits and have the potential accomplish competitive advantage for banks. A bank can increase its number of customers and profit by using ICT applications to serve them. Internet- and m-banking are new tools that offer the potential to ease interaction between banks and their customers without the need for working directly with employees of a bank.

The regression analysis of the original model shown in Table 5.4 below demonstrates that hypotheses H2 and H3 are supported, and that H1 is not supported. The model’s R² value is 0.339, indicating that the model explains 33.9% of the variance in the dependent variable (actual use of the system of ICT in terms of relationships dimensions). Customer satisfaction demonstrated a significant impact on customer loyalty, as did customer trust. These factors lead to an increase in customer loyalty when customers engage with quality self-service technologies in their interactions with the banking sector.

The effect of trust and satisfaction on consumers can be an increase in consumer loyalty, leading to increased repeat purchases of services and greater competitive advantages and profitability of banks. Previous studies in the literature have shown that customer loyalty can lead to an increase in the speed of behavioural intention related to technology (Bove and Johnson 2006). This is of importance for this study as the participants stated that, on their return to Libya, they expect an increase in the availability of self-service technologies in the banking sector.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path</th>
<th>R²</th>
<th>Coefficient</th>
<th>Sig</th>
<th>Result</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1-a</td>
<td>PEOU → TA</td>
<td>0.340</td>
<td>0.088</td>
<td>0.215</td>
<td>Not supported</td>
<td>Positive value</td>
</tr>
<tr>
<td>H1-b</td>
<td>PU → TA</td>
<td>0.340</td>
<td>0.561</td>
<td>0.000</td>
<td>Supported</td>
<td>Significant</td>
</tr>
<tr>
<td>H1</td>
<td>TA → CL</td>
<td>0.339</td>
<td>0.330</td>
<td>0.653</td>
<td>Not supported</td>
<td>Positive value</td>
</tr>
<tr>
<td>H2-a</td>
<td>OBQ → CS</td>
<td>0.167</td>
<td>0.409</td>
<td>0.000</td>
<td>Supported</td>
<td>Significant</td>
</tr>
<tr>
<td>H2</td>
<td>CS → CL</td>
<td>0.339</td>
<td>0.433</td>
<td>0.000</td>
<td>Supported</td>
<td>Significant</td>
</tr>
<tr>
<td>H3</td>
<td>CT → CL</td>
<td>0.339</td>
<td>0.260</td>
<td>0.001</td>
<td>Supported</td>
<td>Significant</td>
</tr>
</tbody>
</table>
Customer trust and satisfaction can be seen as a major contributor to loyalty. Based on the results of this thesis it is recommended that trust-building actions are paid greater attention; this is seen as helpful towards maintaining customers. In the interview analysis, ten interviewees stated that they preferred to be loyal to their bank because it is the best bank in the local area and because it easy to interact with the bank’s website. In the case of loyal customers, banks can further increase the number of customers and maximize profits received from customer interactions via modern technology.

As explained in the previous section, ICT provides the potential for Libyan banks to attract new customers and create positive relationships through the utilization of self-service technologies, with these services being used by Libyans when they are in other countries (Australia in this study) to fulfil this role. This issue has previously been highlighted in the literature, where self-service technologies were used to offer customers an enhanced ranges of services at very low cost, resulting in banks having the potential to provide advantages to their customers (Cracknell 2004). However, the low level of ICT infrastructure in developing countries like Libya is a barrier to develop these self-service technologies and to allow customers to adopt them. One specific significant challenge is the lack of uniform e-payment systems; debit and credit cards (for example Visa and MasterCard) are not common in Libya because of ICT infrastructure limitations, trust and security issues. As a result, many customers have not been able to fully profit from technologies and banks cannot develop better relationships with their customers (Thao and Swierczek 2008, Twati 2008).

This study’s findings have important implications for Libyan banks’ use of ICT applications. They can be used to support Libyan banking staff to better understand the key ICT applications and channels on which they must focus in order to improve customer satisfaction and their services. Effective ICT has become an absolute necessity to engage with customers. It can also improve banks’ efficiency, usefulness, flexibility, cost savings, competitive advantage, data collection and management, and service quality of interactions with customers. ICT has changed banks’ business processes and method of operation internationally. These changes must be understood and responded to by Libyan banks if they are to compete in the rapidly progressing international financial sector.
The results from this thesis present preliminary findings into the technology usage of Libyans before they left Libya (i.e. a developing country) to further their studies compared to during their studies in Australia (i.e. a developed country). Additional challenges faced by Libya, as a developing country, include: the level of customers’ experience with ICT which impacts on Internet- and m-banking uptake and the need for provision of support services during the introduction of new banking channels (Khatri and Kurnia 2011); the management of perceptions about the acceptability of new banking channels; the implementation of the technologies and related systems within banks to support the implementation of self services for customers; and the development of awareness and knowledge about how to derive maximum benefits from new banking channels. Each of these challenges presents areas requiring further research, which will be outlined further in Chapter 6 of this thesis.
CHAPTER 6: Conclusion and Recommendations

6.1 Construction of Thesis

Chapter 1 of the thesis described the research issues, objectives, research method and analysis. It reviewed the research issue, i.e. the role of ICT in enhancing relationships between Libyan banks and their customers.

Chapter 2 presented an extensive review of the literature pertaining to consumer behaviour through the use of Internet- and m-banking, and the constituents of online consumer trust, satisfaction, attitude and loyalty. The literature review identified important factors for this study, such as the nature of Libya (an Arabic country in North Africa) as a developing country, ICT and customer relationships.

Also, it includes, the hypothesis and theoretical model underpinning this study was developed. This framework views ICT adoption as an interactive process within the banking sector, allowing customers to be served from wherever they are, rather than being restricted to physical interaction locations imposed by their bank. The model, which stems from the literature, incorporates seven factors that have the potential to positively affect ICT adoption. Three of the factors are taken from the Technology Acceptance Model (TAM): Perceived Ease of Use (PEOU), Perceived Usability (PU) and Technology Attitude (TA). The four other factors are: Online Banking Quality (OBQ), Customer Satisfaction (CS), Customer Trust (CT) and Customer Loyalty (CL).

Chapter 3 described and justified the methodology used in this study, including the research design, sampling technique, sample selected, the design of the survey and interviews, data management and data coding. This study used a survey as the primary collection tool. Semi-structured interviews were used as a second method of data collection. These interviews were conducted to complement the literature review and explore the themes identified in the survey. Factors analysis to examine the reliability and validity of data collected is included.

The data analysis methods and the appropriate statistical techniques adopted were presented in Chapter 4, along with detailed descriptions and it provided descriptive
statistics and regression analysis to evaluate the model and hypotheses presented in Chapter 3.

Also, it covered analysed the fifteen semi-structured interviews. Responses to the interview questions provided further clarification about the reasons for adoption of self-service technologies and what participants look for when considering their loyalty to a particular bank.

Chapter 5 discussed the results of the research in the light of implications for theory and practice.

Chapter 6, this chapter, presents the contributions that this study has made to theory followed by a review of the implications for both banks and customers based on this research. The limitations of the study and the recommendations for future research are then discussed.

## 6.2 Contributions to Theory

The unique contribution of this study for the developing Libyan banking sector is the rich data on customer beliefs about self-service technologies and their use, gathered through the dual use of surveys and interviews. Both the approach and findings of this study can guide future research investigating this phenomenon in other developing countries. The findings of this study not only enhance the existing understanding of the influence of customers’ relationships in banking, but also provide new knowledge in this field. The data from this study contributes new knowledge to fill the gap in the literature about the strategic alignment of Internet- and m-banking across the banking sector in developing countries.

The proposed research model in this study investigated seven factors (PU, PEOU, TA, OBQ, CS, CT and CL) to evaluate whether these factors were related to the interaction between customers and their banks with regard to self-service technologies. This model has the potential to enhance our understanding of consumer relationships and adoption of electronic services. This research found that only OBQ has a significant impact on CS, and CS and CT have a significant impact on CL. The research model improves our understanding of the consumer adoption of technologies by allowing examination of the combined impact of all factors. The
understanding gained from this collective examination adds understanding of the mechanisms that control consumer adoption of self-service technologies and how their adoption can enhance relationships in the banking sector. The findings show that relationship quality is an important factor that influences customer willingness to accept and use self-service technologies.

This study makes additional contributions by extending previous research through examination of the degree of use of ICT in creating customer relationships in the Libyan banking sector. It identifies the positive effect of ICT in creating customer relationships and enhancing customer loyalty factors, including trust and satisfaction. The participants believed that Libyan banks that implemented creative marketing strategies through delivery of new products and services would increase their market share.

As a result, this research seeks to increase banks’ knowledge about, and awareness of, customers’ willingness to accept new ICT applications. Banks can then respond appropriately. This can be achieved by identifying (groups of) existing and potential customers, segmenting those customers, identifying existing and/or developing support services, implementing these services in a flexible way, and ensuring customers are aware of and able to access these support services.

Consequently, the findings of this study have contributed to the development of a model that enables banks to understand the important role that self-service technology adoption plays in creating customer relationships. This finding is significant within the Libyan context, given that Libyan banks are almost entirely dependent on foreign companies (e.g. Western Union, money gram) to transfer money for customers because they have not adopted their own technologies.

6.3 **Implications of this Research**

This study investigates the role of ICT in the enhancing of customer relationships in the Libyan banking sector through the use of self-service technologies. The research was limited only to Libyan citizens views whilst they were in a country with a highly developed self-service banking system (Australia) for an extended period of time. While other developing countries in the region have some similar features, the
culture, government investment and history of Libya makes it unique. Libya’s banking sector has also not been previously studied extensively from the customer perspective, unlike some of the other countries in the region.

The results of this study cast light on some important issues related to customer intentions toward Internet - and m-banking in the Libyan banking sector. These issues have not been addressed by previous studies.

This study’s findings have important and useful implications for Libyan banks’ adoption of ICT applications. They can be used to guide Libyan banking staff on the key ICT applications that should be their focus in order to improve the satisfaction, trust, and loyalty of their customers.

The participant group in this research was based on a convenience sample of Libyans living in Australia who had temporarily moved to Australia to study. All had intentions to return to live in Libyan on completion of their studies. Thus, all were highly educated and used modern technologies as part of their studies. It was expected that all participants would therefore be able to articulate their opinions and exert influence upon their return to Libya.

One implication of these results is that Libyan banks need to highlight the benefits of ICT applications to their customers, particularly for those systems that are self-service and customer facing. Benefits of these technologies that are important to customers are convenience and increased availability.

Libyan banks need to re-define and re-engineer their businesses with the use of ICT. In the future, banks will need to offer more complicated services to remain competitive. Thus, there is a need to change their approach from traditional banking to convenience banking and also increase their degree of accessibility to customers. The implications of these findings for the Libyan banking sector are significant in that, to survive, banks will need to move away from traditional processes to a new Internet-based form of competition.

Libyan banks should be adopting existing technologies from the developed world to meet the challenges of speed, efficiency and changing customer needs; providing value added services to their customers. These techniques will let customers use
self-service technologies and help customers to complete banking transactions. Internet- and m-banking assist customers to check balances, pay bills, transfer money and identify information on their accounts.

The main benefit for Libyan banks is the creation of competitive advantage through the adoption of ICTs for customer use. The major contribution of this study is that it provides significant evidence that ICT plays a vital role in creating customer relationships in the Libyan banking sector. As a result, ICT is forcing changes to banks’ business processes and the way they operate. ICT has the potential to offer benefits such as better management of customer relationships, and through this, creation of a competitive advantage.

Technology attitude, customer satisfaction and customer trust play a significant mediating role on Libyan customers’ loyalty to their bank. Thus, customers are more likely to adopt and continue to use Internet- and m-banking if they find that the quality of information and services can enhance their expectations and overall banking experience. From discussions with the interviewees, when customers adopt ICTs they find them easy to use and more useful than traditional means of banking at the teller. Therefore, customers can be more engaged once they discover the benefits.

### 6.4 Limitations of this Study

There are several limitations that are evident in this study. These limitations should be considered as potential future research opportunities and areas of future improvement when researching self-service technologies and their adoption in the developing world.

It is almost impossible for any single study to cover every aspect within the research field of ICT and customer relationships. This research used a single survey of 141 respondents, followed by fifteen interviews used to discuss the themes in greater depth. The results might have been further enhanced if a larger number of long-term Internet- and m-banking users had been interviewed. However, it is believed that saturation of the responses was found with fifteen interviews. Given that Internet- and m-banking is still in its infancy in Libya, and the relatively
structured and consistent nature of the Libyan banking sector, the variety of experiences for all Libyans has been limited to date; this is likely to have been a contributor to the saturation of responses achieved using fifteen interviews.

In this research, a survey research method was initially used. The research used a sampling of Libyan citizens who were studying in Australia and who were aged between 18 – 54, they were educated (currently completing undergraduate; master and doctoral degrees). However, the sample respondents are limited to customers in the technology field who are willing to be surveyed.

The limitations of the sample also relates to the number of missing values of the participant demographics (see Tables 6.1 & 6.2) this may have had impacted on the results of this study. As this focused to analysis the adoption of self-service banking technologies the sample may have had an inflated positive intention of technology adoption and use, based on their experiences in Australia. It is suggested that a limitation of some of the banks in Libya not having websites and using other self-service technologies (see Tables 6.4; 6.5 and 6.8) is an issue on the participants return to Libya. However, as these banks develop websites and other self-service technologies in the future, the recommendation is that these websites could be examined in future studies.

This thesis employed data collection from participants in 2011-2012, and the measures of constructs were collected at a single point of time in this study. As ICT acceptance and use changes, both globally and in Libya specifically, the banking sector’s ICT offerings and customers’ responses to them will change. Individuals’ awareness of and attitude towards using Internet- and m-banking may change over time (usually as an on-going process) due to greater experience and advancement of technologies. Results from a repeated study will naturally change over time.

Although every effort was made to make this study as comprehensive as possible, certain limitations were present. The response rate was lower than was hoped for, and this is mainly attributed to difficulties in advertising the questionnaire. Due to the low response rate, the results are less statistically significant, and this may mean that some of the rejected hypotheses would have been accepted had the sample sizes been much larger, and significance levels thus higher.
The empirical evidence of this study was collected from Libyans studying in Australia. This was a convenient sample that met the requirements for study participation (e.g. customers of banks in both Libya and Australia). While this sample offered a number of benefits, its use may have limited the variety of results and thus the scope of the findings. Thus, the results may not be generalizable to or suitable for other nations, since the adoption and usage of technology is varied across countries.

A final external but significant issue that impacted on this study was the political upheaval experienced in Libya during the period in which the study was conducted. The major changes occurring in the country were likely to have impacted on the participants’ responses about the future of banking, reflecting broader uncertainty about Libya’s future during this time.

6.5 Recommendations and Future Research

The following recommendations, both about findings and areas requiring further investigation, are made to the Libyan banking sector in particular, and to the banks of other developing countries that are seeking the adoption of ICT in customer-facing systems to enhance bank interaction with customers:

- Further study is needed to develop a comprehensive view of determinants that influence individuals’ attitudes and decisions around ICT adoption. This requires an understanding of how to best integrate the concepts of consumer relationships, banking, and ICT applications. To achieve this, research must go beyond the theoretical and conceptual bases of ICTs, and join forces with other experts and researchers from related areas (such as consumer attitude and customer relationships management) to establish outcomes that are useful for practitioners.

- Another interesting area for further research could be a detailed study on online banking usage, measuring online banking acceptance along with other possible factors derived from varied sources of literature. Testing of acceptance in conjunction with innovation theories may yield interesting outcomes for customer relationships.
• Although this study has contributed to the current literature, more empirical studies are needed. This recommendation joins previous calls for more empirical tests in the ICT field in order to establish with more reliable and practical recommendations. There is also a need to extend such efforts to cross-national and cross-cultural studies. The need for such studies arises given the fact that existing one-culture one-sample empirical studies are context- and sample-dependent, which makes them hard to generalize. For greater insights, interested researchers from various countries should work together on validating and testing existing and new models in their respective cultures.

• Based on this study, the potential impact of service quality on customer satisfaction in the service industry was noted. Bank (and practically speaking, each banking employee) should ensure that their customers are satisfied. Banks must take responsibility for employing the right workers for the right positions, given that service quality determines customer satisfaction. This may require changes to recruitment processes for banking positions.

• Future research could be conducted to better understand how banks can facilitate greater commitment of customers to effectively use new ICTs, particularly customer focused self-service technologies. One possible example is investigating the impact of involving end users in the decision-making process for adopting new ICTs in banks. Banks may also foster a higher level of customer loyalty by educating them about the need for and application of chosen ICTs for individual and banks’ performance. Additional research could consider the impact of technology services on the future of work, particularly in the area of productivity. These technologies will become increasingly necessary for banks to understand service quality and customer loyalty processes.

• Finally, from the participant feedback, it is recommended that banks ensure they have highly efficient and reliable ICTs in their banking services units. This can be achieved by outsourcing the provision and maintenance of the
ICT support for these units (including all Internet- and m-banking activities), thus helping the bank to enhance productivity and profitability.
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Appendix A: Information sheet to respondents in the survey (English)

UNIVERSITY OF WOLLONGONG
Information sheet – Banking’ customers
The role of Information Technology in enhancing customer relationships in the Libyan banking sector By
By Fouad Omran Elgahwash

PURPOSE OF THE RESEARCH
The purpose of the research is to improve Libyan banking firms’ approach to the use of Information Technology (IT) to create and maintain customer relationships. As result of limited IT usage, many Libyan banks have missed strategic opportunities offered by IT for increasing customer relationships. This study argues that there will be a significant improvement in creating customer relationships and building up long term connections with customers through the usage of IT (online banking and mobile banking).

METHOD AND DEMANDS ON PARTICIPANTS
The participant will be asked to be involved in an interview. This interview will consist of questions about their perception of online banking and its associated benefits. The estimated time to complete the interview is 30 minutes.

POSSIBLE RISKS, INCONVENIENCE AND DISCOMFORTS
Participants will be required to be interviewed and answer questions on their perceptions of online banking about their bank.

All information regarding the answers from the participant will not be individually identifiable. Involvement in completing the interview is voluntary and the participant may withdraw from the study while completing it at any time. The final responses to the interview questions will be de-identified, after there is completed.

The results of the study may be used in the publishing of the Thesis, at academic conferences and in journals.

ETHICS REVIEW AND COMPLAINTS
This study has been reviewed by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted, you can contact the UOW Ethics Officer on + 61 2 4221 4457.

If your bank is interested in participating in the research, a consent form is available for your staff to read and you will be provided the chance to discuss questions with myself, Fouad Elgahwash, (fse500@uow.edu.au, +61421780667) and Dr. Mark Freeman (mfreeman@uow.edu.au, +61 2 4221 3223).
الاخوة الزياني الكرام بليبيا

تحية طيبة:

أنا فؤاد عمران القحوش .. طالب دكتوراه في جامعة وولونغونغ باستراليا، أقوم بإجراء دراسة في الخدمات المصرفية عبر الإنترنت و الهاتف المحمول في الجمهورية العظمى وذلك تحت إشراف الدكتور مارك فريمان.

ابعد بين ايديكم وبك احترام صحة الاستبيان التالية لما لها من أهمية بالغة في تجميع المعلومات المتعلقة بهذه الدراسة تحت عنوان دور كونولوجيا المعلومات في تعزيز العلاقات مع العملاء في القطاع المصرفي الليبي.

والعرض من هذا الدراسة هو لتحسين نهج البنك الليبي لاستخدام كونولوجيا المعلومات لإنشاء وتحفظ على علاقات العملاء لفترات طويلة. وتفضله لمحدودية استخدام كونولوجيا المعلومات فقد غاب عن الممارسات الليبية العديد من الفرص وال استراتيجيات التي تنبهها كونولوجيا المعلومات لزيادة العلاقات مع العملاء. هذه الدراسة تستنتج أنه سيكون هناك تحسن كبير في حقل علاقات العملاء وبناء اتصالات طويلة الأمد مهم من خلال استخدام كونولوجيا المعلومات (الإنترنت والهاتف الموسع).

ويتطلب من الأخوة المشاركون لإكمال هذا الاستبيان الذي سيتألف من الأسئلة حول تصوراتهم من الخدمات المصرفية عبر الإنترنت و الموبييل، وذلك حسب الوقت المقدر لإكمال الاستبيان وهو 30 دقيقة.

علماً بأن جميع المعلومات المتعلقة بمشاركتكم ستكون مجهولة المصدر (بدون اسماء)، وإن مشاركتكم في استكمال الاستبيان طوعي أو إذا رغبت الا شحاب من الدراسة يمكن ذلك في أي وقت، كما أن الاستبيان بيانات لا تظهر نتائج هذه الدراسة ونشرها في المؤتمرات الأكاديمية والمجلات العلمية.

وقد استعرضت هذه الدراسة من قبل لجأ متخصصين في بحوث علوم الاجتماعية والعلوم الاجتماعية بجامعة وولونغونغ الاسترالية. فهي حال لديك أي مخاوف أو شكوك بشأن الطريقة التي نفذت هذا البحث، يمكنك الاتصال بموظف الجامعة على الرقم 61242214457.

ملاحظة: نظرا لصدق الوقت الخاص بالدراسة، عليكم نزوح مشكوريين أرسل الاستبيان فور تعبيته الى العنوان الآتي، وفي أسرع وقت ممكن.

وكل مني فائق الاحترام وجزيل الشكر

فؤاد عمران القحوش

fuad1972_72@yahoo.com

or

Fse500@uow.edu.au

د. مارك فريمان

mfreeman@uow.edu.au
Appendix C: Consent form for respondents in the survey

UNIVERSITY OF WOLLONGONG
Consent Form – Banking ‘customers
The role of Information Technology in enhancing customer relationships in the Libyan banking sector
By Fouad Omran Elgahwash

I have been given information about ‘The role of information Technology in enhancing customer relationships in the Libyan banking sector’ and discussed the research project with Fouad Elgahwash. This research is being conducted as part of a PhD degree supervised by Dr. Mark Freeman in the School of Information Systems and Technology at the University of Wollongong.

I have been advised of the potential risks and burdens associated with this research, which include being part of an interview about online banking, and have had an opportunity to ask Fouad Elgahwash any questions I may have about the research and my participation.

I understand that my participation in this research is voluntary, I am free to refuse to participate and I am free to withdraw from the research at any time. My refusal to participate or withdrawal of consent will not affect my treatment in any way/my relationship with the School of Information Systems and Technology or my relationship with the University of Wollongong.

If I have any enquiries about the research, I can contact Dr. Mark Freeman (+6124221 3223 or mfreeman@uow.edu.au) or if I have any concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on +612 4221 4457.

By signing below I am indicating my consent to:
• being interviewed by the researcher about online banking at the bank that I work for
• My answers to the interview questions being transcribed during the interview by the interviewer.

I understand that the data collected from my participation will be used for the thesis, in conference and journal publications and I consent for it to be used in that manner.

Signed ………………… Date……………..

Name (please print) ……………………………..
Appendix D: Survey sheet for respondents (English)

Information Technology and Banking Questionnaire - Libya

The following questionnaire is designed to gain your opinions of the usage of information technology in the banking sector in Libya.

Background Questions

The following questions are used to understand your background. Please select the most appropriate response(s).

What is your gender?

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

What is your age?

<table>
<thead>
<tr>
<th>Age Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>1</td>
</tr>
<tr>
<td>25-34</td>
<td>2</td>
</tr>
<tr>
<td>35-44</td>
<td>3</td>
</tr>
<tr>
<td>45-54</td>
<td>4</td>
</tr>
<tr>
<td>55-64</td>
<td>5</td>
</tr>
<tr>
<td>65 or Older</td>
<td>6</td>
</tr>
</tbody>
</table>

What is your highest level of education?

<table>
<thead>
<tr>
<th>Education Level</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SECONDARY SCHOOL</td>
<td>1</td>
</tr>
<tr>
<td>HIGH SCHOOL</td>
<td>2</td>
</tr>
<tr>
<td>HIGH DIPLOMA</td>
<td>3</td>
</tr>
<tr>
<td>UNDERGRADUATE UNIVERSITY</td>
<td>4</td>
</tr>
<tr>
<td>POST-GRADUATE UNIVERSITY</td>
<td>5</td>
</tr>
</tbody>
</table>

Which of the following technologies did you use?

<table>
<thead>
<tr>
<th>Technology</th>
<th>NOT AVAILABLE</th>
<th>DON'T USE</th>
<th>WEEKLY</th>
<th>MONTHLY</th>
<th>QUARTERLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile phone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How long have you been using the Internet?

<table>
<thead>
<tr>
<th>Duration</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DON'T USE</td>
<td>1</td>
</tr>
<tr>
<td>UNDER 1 YEAR</td>
<td>2</td>
</tr>
<tr>
<td>1-2 YEARS</td>
<td>3</td>
</tr>
<tr>
<td>2-5 YEARS</td>
<td>4</td>
</tr>
<tr>
<td>OVER 5 YEARS</td>
<td>5</td>
</tr>
</tbody>
</table>

General Banking Questions

Who is your primary bank? ____________________________
How often did you use the following banking services?

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>NOT AVAILABLE</th>
<th>DON'T USE</th>
<th>WEEKLY</th>
<th>MONTHLY</th>
<th>QUARTERLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>In branch teller (face-to-face)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In branch computer terminal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic Teller Machine (ATM)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone banking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet banking</td>
<td></td>
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<tr>
<td>Mobile banking – mobile phone</td>
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</tr>
</tbody>
</table>

Banking Technology Beliefs

Please answer the following questions with this scale in mind:

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>USEFULNESS</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online banking can improve my efficiency in banking transactions.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Online banking can save me a lot of time.</td>
<td></td>
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<tr>
<td>Online banking can enhance my effectiveness in banking transactions.</td>
<td></td>
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<tr>
<td>Online banking can make my banking transactions easier.</td>
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<tr>
<td>Online banking can increase my productivity.</td>
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<tr>
<td>Online banking is/would be convenient for my banking transactions.</td>
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<tr>
<td>Online banking can offer me an alternative to solve my financial problems.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

EASE OF USE

<table>
<thead>
<tr>
<th>Learning to operate online banking is/(would be) easy.</th>
<th>1 2 3 4 5 6 7</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>It is/(would be) easy to interact with online banking.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My interaction with online banking is/(would be) clear and understandable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online banking is/(would be) flexible to interact with.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is/(would be) easy to become skilful at using online banking.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online banking is/(would be) easy to use.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TECHNOLOGICAL ATTITUDE

<table>
<thead>
<tr>
<th>Online banking for banking transactions is/(would be) a good idea.</th>
<th>1 2 3 4 5 6 7</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Online banking for banking transactions is/(would be) pleasant.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online banking is/(would be) beneficial to me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I plan to use online banking again.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I (would) strongly recommend online banking to others.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I (would) intend to increase my use of online banking in the future.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I (would) feel frustrated when I use online banking.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology enhances my relationship with my bank.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology creates positive relationships for both banks and customers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TRUST

<table>
<thead>
<tr>
<th>I am/(would be) concerned with security aspects of online banking.</th>
<th>1 2 3 4 5 6 7</th>
<th></th>
</tr>
</thead>
</table>
I am/would be) concerned with the privacy of my information when using online banking.
Using services outside bank facilities (such as ATM, telephone banking, online banking) is/would be) safe.
In my bank my money and savings are safe.
I trust the information that my bank gives me.
I trust the information I can/would access through online banking.
I feel secure in my service encounters with my bank’s employees.

<table>
<thead>
<tr>
<th>ONLINE BANKING QUALITY</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is/would be easy for me to remember how to perform tasks using online banking.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>It is/would be easy to get my bank’s website to do what I want it to do.</td>
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</tr>
<tr>
<td>My interaction with my bank’s website is/would be) clear and understandable.</td>
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<td></td>
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<tr>
<td>The bank’s website is/would be) easy to navigate.</td>
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<tr>
<td>I can/could) get on the website when I want to.</td>
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<tr>
<td>The site loads quickly (I don’t have to wait long for new material).</td>
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<tr>
<td>In the future I will/would) continue to carry out online banking.</td>
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<tr>
<td>It (could) takes me a long time to complete bank transactions when using online banking.</td>
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<table>
<thead>
<tr>
<th>PRODUCT QUALITY</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>My bank has high quality products.</td>
<td></td>
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<tr>
<td>My bank has an excellent assortment of products.</td>
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<tr>
<td>My bank’s products are among the best.</td>
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<tr>
<td>My bank has a sufficient range of product choices (I can get what I want).</td>
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<table>
<thead>
<tr>
<th>SERVICE QUALITY</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>My bank’s employees are reliable in providing the service I expect.</td>
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<tr>
<td>My bank’s employees understand my service needs.</td>
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<tr>
<td>My bank’s employees are responsive to my service requests.</td>
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<tr>
<td>My bank’s employees are competent in providing expected service.</td>
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<tr>
<td>My bank’s employees are courteous in providing me service.</td>
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<tr>
<td>My bank’s employees are accessible to answer my questions.</td>
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</tr>
<tr>
<td>I can easily communicate with my bank regarding my service needs.</td>
<td></td>
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<tr>
<td>My bank has up-to-date facilities and equipment.</td>
<td></td>
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</tr>
<tr>
<td>My bank provides the help and information that I need.</td>
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</tr>
<tr>
<td>My bank provides help and information for online banking.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SATISFACTION</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall, I am satisfied with my bank.</td>
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<tr>
<td>My bank’s website meets my needs.</td>
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<tr>
<td>I am satisfied with the quality of my bank’s services.</td>
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<tr>
<td>I am satisfied with the interactions that I have had with my bank.</td>
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<tr>
<td>My bank understands my needs.</td>
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<tr>
<td>My bank satisfies my needs.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CUSTOMER LOYALTY</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would classify myself as a loyal customer of my bank.</td>
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<tr>
<td>I do not expect to switch to another bank to get better service in the future.</td>
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<tr>
<td>I would continue to stay with my bank even if I had to pay more.</td>
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<tr>
<td>I have never seriously considered changing banks.</td>
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<tr>
<td>I conduct all my banking affairs at one bank.</td>
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<tr>
<td>I would recommend my bank to friends and acquaintances.</td>
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</tbody>
</table>
These questions should be answered with the following information in mind:

- Internet banking is about conducting banking services on the Internet.
- Mobile banking is using a mobile phone to conduct banking.

<table>
<thead>
<tr>
<th>INTERNET AND MOBILE BANKING</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Internet banking for banking services <em>is</em>/<em>would be</em> easier than using mobile banking.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using Internet banking for banking services <em>is</em>/<em>would be</em> quicker than using mobile banking.</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>When using the Internet for banking services, all services <em>are</em>/<em>would be</em> provided compared with using mobile banking.</td>
<td></td>
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</tr>
<tr>
<td>Mobile banking <em>is</em>/<em>would be</em> more efficient than Internet banking for conducting banking services.</td>
<td></td>
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</tr>
<tr>
<td>It <em>is</em>/<em>would be</em> easier to use mobile banking than Internet banking to conduct banking services.</td>
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<tr>
<td>Mobile banking provides all of the banking services that I <em>(would)</em> need compared to Internet banking.</td>
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</tbody>
</table>

Your contribution to this research is greatly appreciated.

Thank you.
Appendix E: Survey sheet for respondents (Arabic)

University of Wollongong

استبيان تكنولوجيا المعلومات - لعينة الزبائن لمن لديهم حسابات مصرفية بليبيا

يهدف هذا الاستبيان إلى الحصول على ارتكا الخاصة حول استخدام تكنولوجيا المعلومات في قطاع المصارف الليبية. نرجو مشاركتكم في الرسالة المرفقة وفي اسرع وقت ممكن.

الفئة الأولى: المعلومات الشخصية:

الرجاء اختيار إجابة واحدة فقط مماثلة وفقاً لفهم خلفياتك حول استخدام التكنولوجيا.

الجنس

<table>
<thead>
<tr>
<th></th>
<th>ذكر</th>
<th>امرأة</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>1</td>
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</table>

العمر:

<table>
<thead>
<tr>
<th></th>
<th>65</th>
<th>64</th>
<th>55</th>
<th>54</th>
<th>45</th>
<th>44</th>
<th>35</th>
<th>34</th>
<th>24</th>
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<tbody>
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</table>

3. ما هو مستوى التعليم؟

<table>
<thead>
<tr>
<th></th>
<th>دراسات عليا</th>
<th>شهادة ثانوية</th>
<th>معهد عالي</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
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<td>4</td>
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</tbody>
</table>

4. أي نوع من أنواع التكنولوجيا التالية استخدمتها؟

<table>
<thead>
<tr>
<th></th>
<th>غير متوفرة</th>
<th>لاستخدام</th>
<th>أسبوعي</th>
<th>شهري</th>
<th>ربع سنوي</th>
<th>الهاتف المحمول</th>
<th>الهاتف المنزلي</th>
<th>الفاكس</th>
<th>الكمبيوتر</th>
<th>الإنترنت</th>
<th>البريد الإلكتروني</th>
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</thead>
<tbody>
<tr>
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</table>

5. منذ متى ونتستخدم في الإنترنت للتعامل مع المصرف؟

<table>
<thead>
<tr>
<th></th>
<th>لا يستخدم</th>
<th>أقل من سنة</th>
<th>1 سنة</th>
<th>2 سنوات</th>
<th>5 سنوات</th>
<th>أكثر من 5 سنوات</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
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<td></td>
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<tr>
<td>4</td>
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</tbody>
</table>

الفئة الثاني: المعلومات المصرفية العامة:

1. ما هو اسم مصرفك؟

2. كم مرة تستخدم الخدمات المصرفية التالية في ليبيا؟

<table>
<thead>
<tr>
<th></th>
<th>غير متوفرة</th>
<th>لاستخدام</th>
<th>أسبوعي</th>
<th>شهري</th>
<th>ربع سنوي</th>
<th>وجهة نوجه في الصراف الفرع</th>
<th>الكمبيوتر في فرع المصرف</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
القسم الثالث: التقييمات المصرفية:

الرجلة الإجابة على الاستمارة الثالثة مع الاحذاء تغطي نطاق الإجابة المحددة في الجدول أدناه.

<table>
<thead>
<tr>
<th>مواقف فوائد التكنولوجيا</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>التكنولوجيا من الممكن أن تحس فعالية العمليات المصرفية في المصرف من خلال التفاعل مع المصرف</td>
<td>لاوافق بشدة</td>
<td>موافق تمامًا</td>
<td>موافق إلى حد ما</td>
<td>محايد</td>
<td>لا يوافق</td>
<td>لا موافق</td>
<td>موافق بشدة</td>
</tr>
</tbody>
</table>

ينبغي الإجابة على الاستمارة من خلال استيعاب التقييمات المصرفية المستخدمة في استراليا. ويرجى ملاحظة أن الخدمات المصرفية عبر الإنترنت تشمل الخدمات المصرفية عبر الإنترنت والهواتف المحمولة.

1. الخدمات المصرفية عبر الإنترنت تشمل الخدمات المصرفية على شبكة الإنترنت.
2. الخدمات المصرفية عبر الهاتف المحمول (بما في ذلك الرسائل القصيرة) لأدوات الخدمات المصرفية.

<table>
<thead>
<tr>
<th>منطقه استخدام التكنولوجيا</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>الصحة</td>
<td>لاوافق بشدة</td>
<td>موافق تمامًا</td>
<td>موافق إلى حد ما</td>
<td>محايد</td>
<td>لا يوافق</td>
<td>لا موافق</td>
<td>موافق بشدة</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>دور التكنولوجيا الحديثة</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>الخدمات المصرفية الإلكترونية مثيرة للمشغولات المصرفية</td>
<td>لاوافق بشدة</td>
<td>موافق تمامًا</td>
<td>موافق إلى حد ما</td>
<td>محايد</td>
<td>لا يوافق</td>
<td>لا موافق</td>
<td>موافق بشدة</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>اللغة المتعلقة بالخدمات الإلكترونية المصرفية</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>هل تشعر بالقلق حول جهال الأمان للخدمات المصرفية الإلكترونية</td>
<td>لاوافق بشدة</td>
<td>موافق تمامًا</td>
<td>موافق إلى حد ما</td>
<td>محايد</td>
<td>لا يوافق</td>
<td>لا موافق</td>
<td>موافق بشدة</td>
</tr>
</tbody>
</table>
لا يوجد نص يمكن قراءته بشكل طبيعي من الصورة المقدمة.
لا أتوقع التحول إلى مصرف آخر للحصول على خدمة أفضل في المستقبل.
أرغب في البقاء مع نفس المصرف حتى لو اضطررت إلى دفع المزيد.
لا أستطيع النظر بجدية في تغيير المصرف.
أنا أدير جميع شؤوني المصرفي من خلال مصرف واحد فقط.
أنا أرغب في دعم مصرفي من خلال توصية بالإسقاط والمحارف.

| الاتصال والخدمات المصرفيّة المتصلة | استخدام الخدمات المصرفيّة عبر الإنترنت أسلوب من استخدام الخدمات المصرفيّة عبر الموبايل | استخدام الخدمات المصرفيّة عبر الإنترنت أسرع من استخدام الخدمات المصرفيّة عبر الموبايل | الإنترنت يقدّم جميع الخدمات المصرفيّة الإلكترونية مقارنة باستخدام الموبايل المصرفي | الهاتف المصرفي أكثر فعالية من الإنترنت لإجراء الخدمات المصرفيّة الإلكترونية | من السهل استخدام الهاتف المصرفي أكثر من الإنترنت للحصول على الخدمات المصرفيّة الإلكترونية | الهاتف المصرفي يقدّم جميع الخدمات المصرفيّة التي يحتاج إليها مقارنة بالإنترنت |

كم منا فائق الاحترام وجزيل الشكر لمشاركتكم في هذه الدراسة.
Appendix F: Information sheet to interviewees in the interview (English)

University of Wollongong

UNIVERSITY OF WOLLONGONG

Information sheet – Banking’ customers

The role of Information Technology in enhancing customer relationships in the Libyan banking sector

By Fouad Omran Elgahwash

PURPOSE OF THE RESEARCH

The purpose of the research is to improve Libyan banking firms’ approach to the use of Information Technology (IT) to create and maintain customer relationships. As result of limited IT usage, many Libyan banks have missed strategic opportunities offered by IT for increasing customer relationships. This study argues that there will be a significant improvement in creating customer relationships and building up long term connections with customers through the usage of IT (online banking and mobile banking).

METHOD AND DEMANDS ON PARTICIPANTS

The participant will be asked to be involved in an interview. This interview will consist of questions about their perception of online banking and its associated benefits. The estimated time to complete the interview is 30 minutes.

POSSIBLE RISKS, INCONVENIENCE AND DISCOMFORTS

Participants will be required to be interviewed and answer questions on their perceptions of online banking about their bank.

All information regarding the answers from the participant will not be individually identifiable. Involvement in completing the interview is voluntary and the participant may withdraw from the study while completing it at any time. The final responses to the interview questions will be de-identified, after there is completed. The results of the study may be used in the publishing of the Thesis, at academic conferences and in journals.

ETHICS REVIEW AND COMPLAINTS

This study has been reviewed by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the University of Wollongong. If you have any concerns or complaints regarding the way this research has been conducted, you can contact the UOW Ethics Officer on + 61 2 4221 4457.

If your bank is interested in participating in the research, a consent form is available for your staff to read and you will be provided the chance to discuss questions with myself, Fouad Elgahwash, (fse500@uow.edu.au, +61421780667) and Dr. Mark Freeman (mfreeman@uow.edu.au, +61 2 4221 3223).
Appendix G: Information sheet to interviewees in the interview (Arabic)

University of Wollongong

الأخوة الاعضاء، عملاً المصارف الليبية أضمن بيني إيداع ورقية المعلومات تحت عنوان

"دور تقنية المعلومات في تعزيز العلاقات مع العملاً في القطاع المصرفي الليبي"

بواسطة فواز عمران القحوش.

الغرض من هذا البحث هو الإشارة والحافظ على علاقات العملاً طويلة الأمد عن طريق استخدام تقنية المعلومات، ونتيجة لمحدودية استخدام تكنولوجيا المعلومات في البنوك الليبية قد غاب عنها الكثير من الفرص الاستراتيجية لتحسين نهجها الفاعل في إنشاء وزيادة علاقات فاعلة مع

العملاء التي توفرها تكنولوجيا المعلومات.

وترى هذه الدراسة أن يكون هناك تحسن كبير في خلق علاقات العملاء وبناء صلاط طويلة الأمد مع العملاء من خلال استخدام تكنولوجيا المعلومات (الخدمات المصرفية عبر الانترنت والخدمات المصرفية المنظمة).

حوالتصوراتهم حول الخدمات المصرفية عبر الإنترنت والمنافع ستطلب من المشاركين المشاركة الفاعلة في هذه المقابلة و التي تتكون من أسلاة المرتبطة بها وذلك خلال الوقت المقدر لأكمال هذه المقابلة "30 دقيقة".

و المشاركة في استكمال هذه المقابلة ستكون طوعية و للمشارك الحق في أن ينسحب من الدراسة في أي وقت يراه مناسب. علماً بأن جميع المعلومات المتعلقة بالإجابات من المشاركين في هذه الدراسة ستكون محددة ومستخدمة نتاج الدراسة في نشر الارتباط أو المشاركة بها في المهرجانات الأكاديمية والمجلات العلمية الدولية.

وقد استعرضت هذه الدراسة قبل لجنة أخلاقيات البحوث العلمية (العلوم الاجتماعية، العلوم الإنسانية والعلوم السلوكية) من جامعة وولنغونغ.

إذا كان لديك أي مخاوف أو شكاوى بشأن الطريقة التي أجريت هذا البحث، يمكنك الاتصال على الرقم 0061242214457 بمسؤول أخلاقيات البحوث بجامعة أو إرسال أية أية بخصوص البحوث.

كل من الدكتور مارك فريمان:
mfreeman@uow.edu.eu

فواز عمران القحوش:
fse500@uowmail.edu.au
Appendix H: Consent form for interviewees in the interview

University of Wollongong

UNIVERSITY OF WOLLONGONG

Consent Form – Interview

The role of Information Technology in enhancing customer relationships in the Libyan banking sector

By Fouad Omran Elgahwash

I have been given information about ‘The role of information Technology in enhancing customer relationships in the Libyan banking sector’ and discussed the research project with Fouad Elgahwash. This research is being conducted as part of a PhD degree supervised by Dr. Mark Freeman in the School of Information Systems and Technology at the University of Wollongong.

I have been advised of the potential risks and burdens associated with this research, which include being part of an interview about online banking, and have had an opportunity to ask Fouad Elgahwash any questions I may have about the research and my participation.

I understand that my participation in this research is voluntary, I am free to refuse to participate and I am free to withdraw from the research at any time. My refusal to participate or withdrawal of consent will not affect my treatment in any way /my relationship with the School of Information Systems and Technology or my relationship with the University of Wollongong.

If I have any enquiries about the research, I can contact Dr. Mark Freeman (+612 4221 3223 or mfreeman@uow.edu.au) or if I have any concerns or complaints regarding the way the research is or has been conducted, I can contact the Ethics Officer, Human Research Ethics Committee, Office of Research, University of Wollongong on +612 4221 4457.

By signing below I am indicating my consent to:

• being interviewed by the researcher about online banking at the bank that I work for
• My answers to the interview questions being transcribed during the interview by the interviewer.

I understand that the data collected from my participation will be used for the thesis, in conference and journal publications and I consent for it to be used in that manner.

Signed ............................Date.......................

Name (please print) ...........................
Appendix I: Interview transcript sheet (English)

Information Technology and Banking Interview – Conducted with customers – Interview Sheet

Part one: Background Questions

What is your gender?

<table>
<thead>
<tr>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

What is your age?

<table>
<thead>
<tr>
<th>18-24</th>
<th>25-34</th>
<th>35-44</th>
<th>45-54</th>
<th>55-64</th>
<th>65 OR OLDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

What is your highest level of education?

<table>
<thead>
<tr>
<th>SECONDARY SCHOOL</th>
<th>HIGH SCHOOL</th>
<th>HIGH DIPLOMA</th>
<th>UNDERGRADUATE UNIVERSITY</th>
<th>POST-GRADUATE UNIVERSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Which of the following technologies did you use in your bank in Libya?

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>NOT AVAILABLE</th>
<th>DON'T USE</th>
<th>DAILY</th>
<th>WEEKLY</th>
<th>MONTHLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile phone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How long have you been using the Internet banking & mobile banking with your bank?

<table>
<thead>
<tr>
<th>DON'T USE</th>
<th>UNDER 1 YEAR</th>
<th>1-2 YEARS</th>
<th>2-5 YEARS</th>
<th>OVER 5 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

What is your level of IT experience do you have with your bank?

<table>
<thead>
<tr>
<th>DON'T USE</th>
<th>UNDER 1 YEAR</th>
<th>1-2 YEARS</th>
<th>2-5 YEARS</th>
<th>OVER 5 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

What is name of your current Libyan bank?  _________________________

How many years have you used this bank?  _________________________

Why do you choose to use this bank?  _________________________

Which of the following banking services does your bank provide for you?

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>PROVIDES</th>
<th>DOES NOT PROVIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>In branch teller</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In branch computer terminal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic Teller Machine (ATM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone banking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet banking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile banking &amp; Mobile phone</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part Two: Relationship Dimensions

- Do you classify yourself as a loyal customer of your bank?
- Do you/would you recommend your bank to friends/family/colleagues?
  - If Yes, why?
  - If No, why not?

- Do you feel online/mobile banking can enhance your banking transaction processes and make the process of banking easier?
  - If participant states Yes
    - Why is this case?
    - How does online banking meet your needs?
    - How does mobile banking meet your needs?
    - Is it the technologies that you use that you feel enhance your interactions or are there other reasons?
    - Which of the two technologies, online banking and mobile banking, do you find enhances you interactions more?
    - Do you recommend online/mobile banking to others?
      - If Yes, why?
      - If No, why not?
  - If participant states No
    - Why is this case?
    - What would need to change for online/mobile banking to meet your needs?
    - Do you use the same types of online technologies for other services? If yes, why not for banking?
    - Would you ever consider using online banking/mobile banking in the future?
      - If Yes, why?
      - If No, why not?

- Do you believe that technology, such as online/mobile banking creates a positive relationship for both the bank and their customers?
  - If Yes, why?
  - If No, why not?
    - Is the relationship equal in both directions?
    - If they state there is a relationship is it only beneficial to one side (banks/customer)?

- Do you have any concerns when it comes to completing your banking transaction processes online?
  - If so, what are your concerns?
  - Do you believe that these concerns would affect your long term relationship with your bank?

- Can you please discuss your feelings towards the quality of your banks website and online/mobile banking services? (this can be in terms of the information provided, features provided, service/products offered)

- Has your bank provided any methods of backup/support if you experience difficulties when using online/mobile banking, for example telephone support?
  - Have you ever used these services, if so where they useful?

- Have you felt satisfied with the interactions that you have had with your bank and the online/mobile banking services that they offer?
  - If Yes, why?
  - If No, why not?
Part Three: General Information (if the interviewee has stated that they use online banking)

- What training has been provided to you for the IT services offered by your bank?
- Do you believe that introducing IT into the bank has created opportunities for your bank?
- How long has your bank been using IT to allow you to conduct transaction online or via the mobile phone with clients?

Your contribution to this research is greatly appreciated.

Thank you.
Appendix J: Interview transcript sheet (Arabic)

University of Wollongong

السؤال تكنولوجيا المعلومات المتعلقة بالمقابلات الشخصية مع العاملين في البنوك الليبية

القسم الأول: المعلومات الشخصية:

1. الجنس:

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ذكر</td>
<td></td>
<td></td>
</tr>
<tr>
<td>أنثى</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. العمر:

<table>
<thead>
<tr>
<th>عمر</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>فاكر</td>
<td>65</td>
<td>64</td>
<td>55</td>
<td>45</td>
<td>35</td>
<td>24</td>
</tr>
<tr>
<td>25</td>
<td></td>
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</tr>
</tbody>
</table>

3. ما هو مستوى التعليم؟

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>دراسات عليا</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>جامعية</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>مه学到الي</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

4. أي نوع من الاتصالات التكنولوجية تستخدمها؟

<table>
<thead>
<tr>
<th>نوع الاتصال</th>
<th>غير متوفر</th>
<th>أسبوعي</th>
<th>شهري</th>
<th>ربع سنوي</th>
</tr>
</thead>
<tbody>
<tr>
<td>الهاتف المحمول</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>الهاتف المفتوح</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>القمود</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

5. منذ متى ونتستخدم في الانترنت لتبادل المعلومات؟

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>لا تستخدم</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>أقل من سنة</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>أكثر من 5 سنوات</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. ما هي عدد سنوات الخبرة في استخدام تقنيات المعلومات؟

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>لا تستخدم</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>أقل من سنة</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>أكثر من 5 سنوات</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. ما هو اسم البنك الحالي الذي تعمل فيه؟

8. ما هي سلكك الحالي في هذا البنك؟

9. كم لديك سنة تعمل في هذا البنك؟

10. أي من الخدمات البنكية التالية تقوم مصرفك بتقديمها؟
المصرف الفرع
الكلمات في قسم المصرف
ملاحظات المصرف الآلي
الهاتف المصرفي
الخدمات عبر الإنترنت
الهاتف النقال والهاتف المصرفي

القسم الثاني: أسئلة تتعلق بجميع العاملين بال المصرفي:

1. ما هو نوع التدريب الذي تحصلت عليه في المصرفي على الخدمات المصرفية التي تقدمها للعملاء من خلال تكنولوجيا المعلومات؟
2. ما هو توقعاتك في حال اتخاذ البنك على تقنية المعلومات لخدمة العملاء؟
3. هل تكنولوجيا المعلومات قادت بتحسين ممارسات عمل الموظفين تجاه الزبائن؟ لماذا؟ ولماما لا؟
4. هل تقصد كان اتخاذ تكنولوجيا المعلومات في نظام مصرف بيئي فرص جديدة له؟
5. هل تقصد أن تكنولوجيا المعلومات تخلق علاقة مع الزبائن؟ لماذا؟ ولماما لا؟ وهل تساعده ابقاء العلاقة لفترة طويلة؟
6. هل تقصد أن تكنولوجيا تساعد على ايجاد حل لمشاكل ومتطلبات العملاء؟
7. هل استمرت اقطرات العملاء من خلال التكنولوجيا الحديثة امر لا؟
8. هل تعقد باقية العملاء سروراً / تنفس في حال تبني المصرفي الخدمات الإلكترونية لماذا؟

القسم الثالث: أسئلة تتعلق بإعضاء إدارة المصرفي فقط:

1. ما هو عدد العاملين الذين تم توظيفهم ومسنون عن تكنولوجيا المعلومات في المصرفي؟
2. منذ متى مصرفك يستخدم تكنولوجيا المعلومات في عملياته المصرفية مع الزبائن؟
3. ما هو نوع التدريب الذي تمتع العاملين بالمصرف من أجل الرفع وزيادة معرفتهم بتكنولوجيا المعلومات؟
4. هل انت راضي عن أداء العاملين بالصرف من خلال استخدام تقنية المعلومات؟
5. ما هو الصعوبات الرئيسية التي تواجهها مصرفك في حال اعتماد رهناً يتم اعتماده على خدمات تقنية المعلومات في عملياته المصرفية المستقبلية؟
6. ما هو توقعاتك تجاه سير المصرف في حال اعتماده على الخدمات الإلكترونية المصرفية لتعامل مع عملائه؟

للمزيد من قراءات ووجيز الشكر لمشاركتكم في هذه الدراسة
## Appendix K: Total Variance Explained (Factor Analysis)

<table>
<thead>
<tr>
<th>Items</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>KMO df Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total % of Variance</td>
<td>Cumulative %</td>
<td></td>
</tr>
<tr>
<td>Factor One: Perceived Usefulness</td>
<td></td>
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<td>Cumulative %</td>
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<td>Factor Two: Perceived Ease of Use</td>
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<td>.243</td>
<td>4.047</td>
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<tr>
<td>Factor Three: Technology Attitude</td>
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<td>Cumulative %</td>
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<td>Factor Four: Customer Trust</td>
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<td>Factor Five: Customer Satisfaction</td>
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<td>Factor Six: Customer Loyalty</td>
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<td>Cumulative %</td>
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<tr>
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<td>3.480</td>
<td>57.992</td>
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<td>Factor Seven: Online Banking Quality</td>
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The factor analysis conducted in this research for each of the factor in the model found that the Kaiser-Meyer-Olkin (KMO) measure (see table above) for each item was modelled as a reflective indicator for the construct. The KMO technique was used as a measurement and all factors in the measurement model have adequate convergent validity, as all factor loadings were greater than 0.6. All measures are displayed (above) and have high internal consistency. For example, KMO for factors such as PU, PEOU, TA, CT, CS, and CL were values of 0.785, 0.859, 0.805, 0.675, 0.819 and 0.853 respectively. Therefore, it was concluded that conducting factor analysis was suitable and it is recommended level for using in this study. As the loading factors for each instrument exceeded 0.6, this meets that they are statistically significant at the 0.05 level, hence the data has excellent convergent validity for all latent variables. Thus the discriminate validity supports all constructs.

### Factor Eight: Product Quality

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Extraction Method: Principal Component Analysis.

Note: The Kaiser-Mayer-Olkin of sampling adequacy = 0.748

### Factor Nine: Services Quality

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Note: The Kaiser-Mayer-Olkin of sampling adequacy = 0.748