Self-Service Technology Banking Preferences: Comparing Libyans’ Behaviour in Developing and Developed Countries

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ABSTRACT

Technology-enabled banking services are currently being implemented in developing countries. This research examines how citizens of developing countries adapt to these changes in their banking services. Technological expansion has been occurring in the Arabic region since the 1980s; however, the focus has been on trade and services offered by industries. The banking sector is an information intensive industry and should be at the forefront of advanced use of Information and Communication Technologies (ICTs). The banking sector has started to utilize technology-enabled services through the internet and mobile devices, with the goal of improving customer relationships by empowering customers. One common trend is increasing the use of self-service technologies, which are facilitated by ICTs. This study discusses how Libyan banks should focus their technology strategies to relate to customers, reduce costs and improve services, achieved through the use of a survey completed by customers who have become accustomed to technology-enabled banking services in the developed world. The current availability of technology-enabled banking services in Libya is limited. This paper presents a comparative review of the use of technology-enabled banking services by Libyans when they are in Libya and whilst they are in Australia (a foreign developed country where Libyans are furthering their education).

Keywords: Banking, Information and Communication Technologies (ICTs), Libya, Self-Service Technologies, Technology Adoption, Technology Use

1. INTRODUCTION

There have been rapid changes in the ways that customers deal with their banking institutions, with technical innovations leading to the adoption of technology-enabled banking (electronic banking (e-banking) and mobile banking (m-banking)). These have become a common channel of choice for interactions between customers and their banking institution, compared with traditional face-to-face interactions. Self-Service Technologies (SSTs) have made it easier for customers to complete banking transactions and other related banking...
services as they provide increased availability of services, with customers being less dependent upon the opening hours and location of their bank (Storbacka, Strandvik, & Grönroos, 1994). The incentives for customers to use these new banking channels are expectations of increased productivity, decreased costs and increased added value. The ubiquitous nature of e-banking has created a shift in the relationship between customers and their banking institution.

Throughout the developed world, the implementation and usage of Information and Communication Technology (ICT) in the service sector has been dramatic. The banking sectors’ operations have altered as they have adopted ICT applications into the banking process (Cracknell, 2004; Jalal-Karim & Hamdan, 2010). Customers have highlighted the need for services to be provided through the Internet and mobile phones (Akel & Philips, 2001; Jalal-Karim & Hamdan, 2010). As a result, ICT services have replaced normal straightforward face-to-face interactions with online banking services (Amin, 2007), a SST. As a result, the ICT revolution has set the stage for increases in financial activity across strategies in the banking sector and it is altering a rapidly moving market place (Jalal-Karim & Hamdan, 2010). This technological development has influenced the range of services and led to improved availability for increasingly larger client groups. Self-service has become one of the key concepts of technologies (Banerjee, 2009; Freeman, 2009). Despite these advances in the developed world, the situation has been remarkably different in developing nations, as the core technologies have not previously been available to customers and face-to-face service has been the norm.

This paper presents the recent advancements in the banking sector generally, with the adoption of comprehensive SSTs used to create improved customer relationships (Jalal-Karim & Hamdan, 2010). Initially, an explanation of the case study of Libya is presented. A review of the potential benefits of SSTs to the customer, through m- and e- banking, is then provided. Finally a preliminary investigation of the SSTs that are used by Libyans in Libya compared to Australia is presented, highlighting the differences in use between the two countries. This study provides the starting point for identifying the types of services that future Libyan professionals could use on their return to Libya. To achieve the goal of determining the technologies with potential for improving customer relationships in the Libyan context, the following questions need to be addressed:

1. What types of ICT technologies are used by Libyans:
   a. In Libya (i.e. a developing country) and
   b. In Australia (i.e. a developed country)?

2. Which ICT-enabled banking services (i.e. ATMs, phone banking, Internet banking and mobile banking) are used by Libyans:
   a. In Libya (i.e. a developing country) and
   b. In Australia (i.e. a developed country)?

This study is unique as, rather than focusing on technology adoption within a specific developed or developing country, this study considers the adoption choices of users from a developing country, comparing their usage of banking services in both their home (developing) country and in a developed country. Prior research has identified that developing countries can take advantage of both developed and other developing countries to model their growth of e-business adoption (Raven, Huang, & Kim, 2007).

2. THE LIVBAN CASE

In most developed countries, technology is a central element in dealing with the challenges of modern banking, including lowering costs and enabling efficiency improvements. Certainly, most banks worldwide are highly successful at utilising ICT to provide efficient banking services to their customers. Libya is in a unique position to realign its priorities for the use of technology throughout its banking system, with an interim Government being formed on December 4, 2011, and most of the UN
sanctions that had previously frozen Libya’s foreign assets being lifted on December 16, 2011. These events have provided the Central Bank of Libya with the ability to support the exchange rate, increase economic stability and manage public expectations (The World Bank, 2012). This section highlights the policies under the previous regime. It should be noted that the modernisation of the Libyan banking system is clearly identified in the Strategic Plan for the Central Bank of Libya (Central Bank of Libya, 2012).

In 1993, Libya created a new law allowing the establishment of private-sector banks. Rules allowing Libyan banks to seek foreign partnerships provided opportunities for greater foreign investment in the local banking sector. However, as with other sectors of the economy, the business environment created a disincentive for foreign banks due to regulations and the unpredictable nature of government policy. In 2006, the government of Libya introduced laws enabling greater financial liberalisation and introduced a flexible banking system, albeit, in a cautious fashion (Central Bank of Libya, 2006), with general recognition that development of the banking sector was essential for Libya’s economic reform (Twati, 2008). It has been identified that the adoption and ongoing use of e-commerce by Libyan citizens has been constrained by three main challenges, one of which was Libya’s banking system (Hunaiti & Masa’deh, 2009). In 2008, most Libyan banks were still using manual systems of banking, and technology-enabled systems had not yet found their way to most banks (Twati, 2008). Although banks in Libya have been able to differentiate themselves using a low cost model, many banks have focused on achieving excellence through customer service. In contrast, the Commerce and Development Bank has benefited by serving their customers through adoption of ICT technologies since their inception. With 83% of the funding of Libyan banks coming from customer deposits, the current and substantial modernisation program underway across the Libyan banking system to upgrade available services, and deal with the use of non-cash payment instruments (debit cards, credit cards, etc.) used in most parts of the world is essential.

According to the Central Bank of Libya Annual Reports (2005; 2006), most banks in Libya have adopted new ICTs. These ICTs include core banking systems with automated cheque processing, Visa, Mastercard and Automatic Teller Machines (ATMs). These ICT programs were designed to introduce SSTs to customers. To allow Libya to keep pace with the rest of the world, the SWIFT system (used for transferring money worldwide through ICTs) has been introduced in the last few years (Twati, 2008; Twati & Gammack, 2006).

With an understanding of the change in banking policies within Libya, it is important to also consider the access that citizens have to technologies to utilize these SSTs. The number of Internet users in Libya was approximately 353,900 in 2009, with a population of approximately 6,735,620 in July 2012 (The World Bank, 2012). In 2009, approximately 5.5% of the Libyan population had direct access to the Internet, which is a very low percentage even for a developing country. However, Kridan and Goulding (2006) noted the popularity of Internet cafes within Libya which increases this level of Internet use significantly beyond those with direct access. In 2010, there were 72,800 fixed broadband lines in the country, with overall Internet use increasing to 14% of the Libyan population by 2011 (The World Bank, 2012). As a result, some banks have considered this low level of adoption as a reason not to provide technology-enabled banking services via the Internet. However, telephone and mobile banking is a service that is starting to be used by banks, with estimates that approximately 10.9 million mobile phones are in service (The World Bank, 2012). Historically, Libyan banking has relied heavily on traditional face-to-face channels to provide banking services to customers; this is one of the many reasons why banks suffer from an inefficient manual process of banking.

From a customer relationship perspective, Libyan banks have understood that improving this relationship is an important factor for success, and that the cost to acquire a new customer is always higher than to maintain a
3. SELF-SERVICE TECHNOLOGIES

Information and Communication Technologies (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. Individual services can be enhanced, with services and products transformed to meet new customer demands and ICT tools being used to increase interaction with customers (Wells, Fuerst, & Choobineh, 1999). Interactions with ICTs will reflect directly on customers’ decisions about banks. 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.

Studies by Leek, Turnbull and Naudé (2003), Ayed Mouelhi (2009), and Costello and Tuchen (1998) have determined that up to 56% of firms in the banking sector commonly use Internet-based SSTs for online transactions. Leek et al. (2003) noted that only 38% of banks used the Internet for purchase processes and only 10% of financial firms used the Internet for customer support services. It can be clearly seen that ICT tools have the potential to provide beneficial applications for both customers and the Libyan banking sector in the future. From a developed country perspective, 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 SSTs such as email, electronic mediums and the Internet. These tools have created the potential for change in firms’ delivery of products for clients, and as a result ICT creates market wide accessibility to service face-to-face customers. A number of the tools used in ICT (such as mobile phones, e-mail, Internet, audio and video conferencing) will together likely change the future of Libyan financial firms and clients. SSTs seek to move processes towards individual customers (Leek et al., 2003) and facilitate the provision of better products and services at lower prices (Chesher & Kaura, 2003). Thus, SSTs are significant at reducing costs and increasing flexibility.

Although largely ignored by developed countries, due to their ubiquity computers can create business value by restructuring the bank-
ing sector to enhance its effectiveness. Most firms in the Libyan banking sector now have a network of computers and related devices because the core functions of storage, processing and communication are facilitated through these devices. The following section provides details of the two main examples of SSTs that are currently being adopted by Libyan banks: mobile banking and Internet banking.

### 3.1. Mobile Banking

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 & Pasanen, 2007). The term m-banking refers to performing banking activities (such as viewing an account balance or performing an account transactions) via a mobile device. This is most often presented via SMS, mobile voice and mobile banking applications. M-banking provides an additional channel to reach customers. Services that can be provided through m-banking include (Scoranavacca, 2006; Laukkanen & Pasanen, 2007): view account balance; view account transaction history; view credit card information; view loan statements; monitoring of term deposits; process one to one payments; bill payment processing; domestic and international fund transfers; status of requests for credit, including mortgage approval, and insurance coverage; loyalty-related offer based services; and exchange of data messages and email, including complaint submission and tracking.

Previous studies have identified that m-banking has had a positive influence on relationship processes between banks and customers. M-banking has significantly changed the way many customers access their bank account (Poustchi, 2004). It has been strongly established as the most important distribution and communication channel for retail banking, its broad reach across the developing world has shown it to be one of the most significant technologies for customers (Donner & Tellez, 2008), and it provides an opportunity for banking institutions to introduce new services to customers (Amin, 2008).

However, in developing nations such as Libya, there has been little demand for mobile banking (m-banking) services in the banking sector (Dewan et al., 2009). Libyan banks have traditionally delivered services through face-to-face interactions with customers at branch offices. Recent modernization of telecommunications has enabled new access methods for banking services. As stated previously, only two Libyan banks currently utilize mobile banking as part of their services, however, with the penetration of mobile phones in the country this is one potential channel that could be used to increase customer loyalty. Notably, m-banking is the first communications technology to have more users in developing countries than in developed ones; e.g. more than 800 million mobile phones were sold in developing countries in 2003 (Ivatury & Pickens, 2006).

### 3.2. Internet Banking

The changes facilitated by the Internet are evolutionary and have influenced the financial sector internationally (Davison et al., 2000). The adoption of Internet technology is occurring in developed and developing countries, and it changes banking from traditional delivery channels to electronic delivery channels (Ahmed et al., 2009). In developed countries like the USA, UK and Australia, Internet technologies have been used by the banking industry for several years, and banks have followed strategies to encourage their clients to employ e-banking. For example, a study (Evans & Sawyer, 2009) in Australia reported that 37% of business services were delivered to the customer via the Internet in 2009, compared to 21% of business services during 2005.

Libyan banks have utilized (limited) Internet-based interactions with customers since 1998, which has required these banks to regularly upgrade their technology (Twati, 2008). The Internet has emerged as an important new business tool with the interaction of communication with customers, as it provides many types of communication among clients and banks such as single-to-single and either many-to-many or limited-to-overall reaches.
The slow adoption of technology to support banking in Libya is resulting in Libyan banks and their customers missing out on the usefulness and convenience of Internet technologies (Al-Hajri & Tatnall, 2008). Internet banking is one of the most important forms of dealing online and building relationships with individual customers because it allows banks to provide services through the use of the Internet without traditional temporal and spatial borders (Xu et al., 2009). Therefore, the Internet can serve as an interactive channel for direct communication and information exchange between clients and bankers. It helps customers to access accounts, transfer funds and buy products online (Mastoori, 2009; Al-Sukker, 2005). Elalag (2003) found, that of the 4370 clients who visited web sites, 82% of them preferred to interact with banks via the Internet because of the logic and predictability of the interactions, and 22% of customers believed they were likely to get the best service for the best price because of the Internet.

The Internet has led to an explosion in the development of activities in the banking sector and the economic development of most nations (Al-Hajri & Tatnall, 2008). Characteristics that have impacted on the rate of e-banking adoption include reputation, protection, social desirability, compatibility, convenience and proficiency (Mastoori, 2009). These factors can be considered as drivers of e-banking adoption by customers. Internet trust and security have also been found to play a serious role in Internet banking adoption, with negative perceptions of these issues creating challenges for customers’ e-banking adoption (Xu et al., 2009). Therefore, these characteristics of the Internet can lead to increased efficiency and improved competition of banks to service clients when managed well.

Jordanian banks have reported two main benefits of using the Internet (Al-Sukker, 2005). Firstly, bankers can deliver a great level of information about the bank’s services showing full costs via the Internet in a short amount of time. Customers and potential customers can use it to identify deals and then for self-service after they have made a decision about which product is suitable for their needs. Secondly, e-banking allows interaction between the bank’s systems and clients, with a high degree of flexibility of communications and interaction. In fact, the Internet is an important element for banks to create relationships and attract non-customers when it has sent voice or e-mail. E-mail is one of the most effective technologies for providing good opportunities for fast business and very high value for customers. Employees can use e-mail for personalized communication, or to communicate with all customers simultaneously (Al-Sukker, 2005).

Brown (2009) has shown that customer satisfaction with banking services has several dimensions, including support satisfaction for clients, ease of use, security, transaction, payments, information content, customer trust and innovation. Thus, these factors help clients to make positive decisions towards adopting online services with banks over a long period. Moreover, the Internet has removed many barriers of interaction among customers and bankers by eliminating the obstacles created by geography, time, location and creating smooth business (Alyabis, 2000). Banks are able to use the Internet to establish advantages and minimize the issues when they interact with customers.

Indeed, e-banking has presented competitive advantages via cost reduction, positive word-of-mouth communication, better satisfaction, trust and customer loyalty. Evans and Sawyer (2009) identified that the Internet has given banks the ability to communicate with customers in a personalized way without the need for face-to-face interaction, saving communication costs with generation of revenues when communications occur through e-mails and live chats (Ahmed et al., 2009). In reality, it has led to an increase in service efficiency of banks, with lower costs of operations towards customers and avoiding losing customers who probably would have switched to another bank (Mastoori, 2009; Xu et al., 2009; Ahmed et al., 2009). The Internet has offered wonderful potential for expanding the marketplace, creating new clients, reducing costs and improving profit margins for banks (Alyabis, 2000).
can improve banking management for most processes of relationships with customers and it provides opportunities to expand a bank’s marketplace compared to other banks (Xu et al., 2009).

3.3. Diffusion of Innovations

There have been a number of factors that the literature has identified as affecting an individual’s adoption of a technology. Rogers (2003) identified five perceived attributes of innovation: relative advantage; compatibility; complexity; trialability; and observability. Each of these perceived attributes plays a role in an individual’s choice to adopt, or not adopt, a product/service. Customers’ relative advantage of using e-banking is that they can interact with the service anytime from anywhere. The Internet has been used by banks to offer services to a wide range of customers over a broad geographic area (Akel & Phillips, 2001). For example, e-banking can provide services with a high degree of convenience, speed, low price and high value for customers, and it does not rely on the opening hours of banks or the location of customers (Mastoori, 2009; Ahmed et al., 2009). E-banking is highly compatible with the existing arrangements of most customers; it can be used with a customer’s own ICT equipment and their current bank accounts. Complexity has the potential to be an issue as it is determined by the system(s) used by the bank and a customer’s proficiency with the Internet. Trialability of e-banking could be conducted through the use of in-branch kiosks. This would allow a customer to observe e-banking and ask any questions that they have about using the service, thus reducing the complexity of adoption. In a previous study by Sathyte (1999) on the adoption of e-banking in Australia during the late 1990s, the major inhibiting factors of customer adoption of e-banking were identified as the lack of awareness of e-banking and security concerns. Low awareness was attributed to customers’ being unable to observe other users interacting with e-banking systems. In Australia, the nature of engagement with e-banking has changed since Sathyte’s (1999) research was published. Evans and Sawyer (2009) noted this increase in adoption in their more recent studies.

The diffusion of a product/service does not occur immediately. There is a normal frequency of adoption for products and services, which Rogers (2003) refers to as the “adopter categorization on the basis of innovativeness” (p. 281). During this normal adoption process, the product/service is adopted initially by the innovators in a society. Following this, the early adopters adopt, and then the early majority. Adopting later in the process are the late majority and the laggards of an adoption. When considering the introduction of e-banking in a country, this adoption process is important to consider.

Diffusion of an innovation in a developing country is impacted by four areas: the regulatory environment; infrastructure; policies; and culture (Raven et al., 2007). Each of these areas need to be taken into consideration for technology transfer to occur and for the country to ‘leapfrog’ the traditional technology developmental processes. This idea of leapfrogging has also been identified by Davison et al. (2000). The developments that have occurred in these areas for Libya have been discussed in Section 2 of this paper.

4. METHODOLOGY

As this paper focused on Libyans who are in a foreign country (Australia) and use banking systems in both Libya and Australia, it is important to consider the population of this sample. The present population of Libyans who are studying in Australia is 2,601 (753 higher education & ELICOS 1,848) (Australian Education International, 2011). Students are the ideal sample group for this study as 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.

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

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population with the population of the study known. The sample was chosen from the Libyan community (students) who live in different cities in Australia. A cover letter in Arabic (Official Language of Libya) was sent explaining the importance of the study and requesting a response from the respondent. 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 & Tellez, 2008; Jalal-Karim & 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.

This paper presents the results from the questions asked to participants about the technologies that they used when they were in Libya before coming to Australia to further their education and the technologies that they currently use while they are in Australia. Questions were asked about their interactions with their bank in both Libya and Australia. Participants were asked to state whether the particular technology was available at their bank and, if it was, whether they used or did not use the technology. Participants were asked if they used the traditional method of going to a teller to complete their transactions and then were asked about a number of technologies. The technologies that were focused on were: Automatic Teller Machines (ATMs); telephone banking; Internet banking; and mobile banking. Descriptive analysis of the data was conducted using SPSS 18 and there were 141 responses that were suitable for analysis from the 384 surveys sent (approximately 36.7% valid response rate).

5. RESULTS

The following section of the paper presents the results from the study. Initially the descriptive statistics of the participant demographics are presented. This is followed by an analysis of the responses to technology use and banking technology use by participants in both Libya and Australia.

The descriptive analysis of data is important to understand the sample of participants and how this relates to the overall population.

From the frequency distribution of the respondents (Table 1) it can be seen that there was a total of 141 respondents. 74% of the respondents were male and 26% of respondents were female. Although this does not reflect the Libyan population (CIA World Factbook, 2012) the figures may reflect the population that is being educated in Australia. In terms of age, 1.4% of the respondents were 24 years or less. The age group analysis shows that the majority of the respondents (52.8%) were in the age range of 25-34 years, and 37.7% were in the 35-44 years range. Only 5.6% of the respondents exceed 45 years. In Libya, 62.7% of the population are 15-64 years old, and the median age of a Libyan is 24.5 years (CIA World Factbook, 2012) so the sample is slightly above the national average. However, the sample age range reflects those people most likely to engage in e-banking and m-banking on their return to Libya. With respect to the level of education, respondents were primarily people with high education. In 2003, Libya had a school life expectancy of 17 years of education (CIA World Factbook, 2012). Although, this sample size is above the national average, as stated above studies in other countries have shown that professionals are more likely to engage in online activities (Ahmed et al., 2009; Donner & Tellez, 2008; Jalal-Karim & Hamdan, 2010).

Table 2 above shows a comparison of the use of technologies by participants in both Libya and Australia. The results indicate that there is greater use of most technologies when participants were in Australia. All participants stated that they used the Internet while in Australia. The only exception to higher technology usage in Australia was the traditional telephone, with a large number of participants stating that they did not use that technology in Australia. The Computer and Internet usage differs greatly from the national average of Libya, where only 14% of the population currently using the Internet (The World Bank, 2012). This may be
Table 1. Demographics for participants

<table>
<thead>
<tr>
<th>Measure</th>
<th>Item</th>
<th>Frequency</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>104</td>
<td>73.8</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>37</td>
<td>26.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>141</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td>18 – 24</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>25 – 34</td>
<td>74</td>
<td>52.5</td>
</tr>
<tr>
<td></td>
<td>35 – 44</td>
<td>53</td>
<td>37.6</td>
</tr>
<tr>
<td></td>
<td>45 – 54</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>137</td>
<td>97.2</td>
</tr>
<tr>
<td>Missing</td>
<td></td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>Education Level</td>
<td>High school</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>High diploma</td>
<td>34</td>
<td>24.1</td>
</tr>
<tr>
<td></td>
<td>Undergraduate</td>
<td>46</td>
<td>32.6</td>
</tr>
<tr>
<td></td>
<td>Postgraduate</td>
<td>53</td>
<td>37.6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>136</td>
<td>96.5</td>
</tr>
<tr>
<td>Missing</td>
<td></td>
<td>5</td>
<td>3.5</td>
</tr>
</tbody>
</table>

A reflection of the sample population; the fact that the participants are in Australia furthering their education indicates that this is not a normal cross-section of the overall Libyan population. This sample population that uses the Internet in both Libya and Australia have a greater chance for adopting e-banking as they are already using the complex technology and have observed its benefits. This is in alignment with some of Rogers (2003) perceived attributes of innovation.

Table 3 above shows the results of the usage of banking technologies in both Libya and Australia by participants. There is increased usage of technology-enabled banking services while participants are in Australia compared with how they conducted their banking in Libya. This identifies 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. The results also show that traditional face-to-face interactions with a bank teller (used by 106 participants in Libya compared with 75 participants in Australia) are used less by Libyans when other technology-enabled services are available.

Table 4 above shows how customers have changed their use of the 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 4. 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 4, an increase in the adoption of SSTs
Table 2. ICT device use in Libya and Australia

<table>
<thead>
<tr>
<th></th>
<th>Telephone</th>
<th>Mobile Phone</th>
<th>Computer</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Libya</td>
<td>Australia</td>
<td>Libya</td>
<td>Australia</td>
</tr>
<tr>
<td>Not Available</td>
<td>32</td>
<td>26</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>Don’t Use</td>
<td>16</td>
<td>34</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Use</td>
<td>89</td>
<td>55</td>
<td>119</td>
<td>133</td>
</tr>
<tr>
<td>Total</td>
<td>137</td>
<td>115</td>
<td>140</td>
<td>138</td>
</tr>
<tr>
<td>Missing</td>
<td>4</td>
<td>26</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

while the participants were in Australia can be seen. To analyse whether these results showed any significant changes in participant use of SSTs between Libya and Australia, a McNemar Chi-squared test was conducted.

Table 5 above shows the results of the McNemar Chi-squared tests conducted on the data from Table 4. The tests all show significant changes in participant use of the services. 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 SSTs (ATM, phone banking, Internet banking and mobile banking), the significant difference occurred in the direction of increased adoption of the services. The increased level of adoption could be attributed to the increased availability of the banking SSTs to the participants, an 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 SSTs compared to ‘at the teller’ due to language and geographic issues. Future research through participant interviews would inform an increased understanding of the reasons for these changes in service usage between the developed and developing country.

6. DISCUSSION AND CONCLUSION

As shown in the section above, ICT provides the potential for Libyan banks to attract new customers and create positive relationships through utilization of technology-enabled services, as these services are used by Libyans when they are in other countries. This issue has previously been highlighted in the literature, where technology-enabled services were used to offer customers an enhanced range of services at very low cost, resulting in banks

Table 3. Banking technologies used in Libya and Australia

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<tr>
<th></th>
<th>At a Teller</th>
<th>ATM</th>
<th>Phone Banking</th>
<th>Internet Banking</th>
<th>Mobile Banking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Libya</td>
<td>Australia</td>
<td>Libya</td>
<td>Australia</td>
<td>Libya</td>
</tr>
<tr>
<td>Not Available</td>
<td>28</td>
<td>11</td>
<td>78</td>
<td>0</td>
<td>79</td>
</tr>
<tr>
<td>Don’t Use</td>
<td>4</td>
<td>36</td>
<td>37</td>
<td>4</td>
<td>42</td>
</tr>
<tr>
<td>Use</td>
<td>106</td>
<td>75</td>
<td>19</td>
<td>136</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>138</td>
<td>122</td>
<td>134</td>
<td>140</td>
<td>133</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td>19</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

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Table 4. Banking changes between Libya and Australia

<table>
<thead>
<tr>
<th></th>
<th>At a teller</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>4</td>
<td>85</td>
<td>21</td>
<td>88</td>
</tr>
<tr>
<td>Don’t:Do</td>
<td>4</td>
<td>118</td>
<td>44</td>
<td>114</td>
<td>40</td>
</tr>
<tr>
<td>Do:Don’t</td>
<td>35</td>
<td>1</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>4</td>
<td>6</td>
</tr>
</tbody>
</table>

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 technology-enabled services and to allow customers to adopt them. One specific significant challenge is the lack of uniform e-payment systems; credit cards 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 (Twati, 2008; Thao & Świerczek, 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 saving, 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 paper 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). The data from this paper can contribute new knowledge to fill the gap in literature addressing technology adoption while a person is in a foreign country for an extended period of time. Further research is needed to understand this relationship between what a person does when living in a developing nation compared to how they interact when they are in a developed nation for an extended period of time, as well as their expectations upon returning to the developing nation.

Additional challenges faced by Libya, as a developing country, include: the level of customers’ experience with ICT which impacts

Table 5. McNemar Chi-squared test on banking changes

<table>
<thead>
<tr>
<th></th>
<th>Chi-Squared</th>
<th>df</th>
<th>P</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>

* statistically significant as P<0.05

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on m-banking uptake and the need for provision of support services during the introduction of new banking channels (Khatri & 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 SSTs 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.

REFERENCES


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Fouad Elghwash is Doctorate of Philosophy candidate in the School of Information Systems and Technology at the University of Wollongong, Australia. His research topic is investigating how technologies can be used to enhance customer self-service within the Libyan banking system compared to the Australian banking system; believing that technology is going to hold the key for the future of banking in the developing world. Previously Elghwash was acknowledged for teaching excellence as member staff at Az-Zawia University as a University Teaching Fellow during the period of 2006-2008, focusing his teaching around strategies for the enhancement of customer services within Libyan financial organizations.

Mark Freeman is a lecturer and the Director of Industry and Community Engagement in the School of Information Systems and Technology at the University of Wollongong, Australia. He is a member of the Centre for Socio-Technical Information Systems. He received a PhD from the University of Wollongong, where his doctoral research examined the relationship between human-computer interaction and e-commerce systems. His primary research areas are human-computer interaction and e-learning where he has published his work in journals and at a number of international information systems conferences. Other research areas include community informatics, knowledge management and social networking technologies.