

Factors influencing customers' decision to adopt online banking services in Libya

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5.3.4 Security

H5: *The perceived level of security is positively related to perceived usefulness*

Based on Table 9, the security and usefulness of online banking is positively correlated with degree of association equal to 0.401. For the fitted model quality, the explained variation in usefulness is 16.1% which is not somewhat accepted from one predictor variable. The effect of security is positive and very highly significant ($b=2.651$, $t=21.463$ and $p\text{-value}=<0.001$) and, hence, H5 is accepted.

Table 9: Results of simple regression model for security and usefulness of online banking

Model	Coefficient			Correlation	R-squared
	b	t-statistic	p-value		
Constant	1.975	15.064	<.001	.562	.316
Usefulness	.519	15.623	<.001		

4. Conclusion

The research aimed to examine individuals' perceptions of online banking services in Libya. Particularly, this research attempted to explore the factors that may guide Libyan banking customers to use online banking by using TAM variables (ease of use and usefulness) and additional impacting factors, namely, support and security.

The findings illustrate that Libyan banking customers agree to the adoption of online banking services. This, however, depends on their attitudes and on the perceived support, security, ease of use and usefulness of the online banking services.

In the meantime, perceived ease of use and perceived usefulness were found to be major determinants of online banking services in Libya. As a result, the Libyan banks need to highlight the quality of their online services, and retain existing customers and acquire new customers via the use of the online banking services.

The significant findings of this research contribute to the body of existing knowledge and have implications for decision and policy makers in the Libyan banking sector. Indeed, this research is the first study that looks at the perspectives and prospects of online banking among Libyan bank customers by using TAM theory. Moreover, the findings will provide more information for decision makers in the Libyan financial industry to support them in their attempts to provide and develop online banking services in Libya.

Researchers aiming to undertake more studies in this area are advised to take into account some additional variables such as trust, government contribution, internet network quality and credibility in order to provide more comprehensive results. Furthermore, future studies could be directed to other countries that have not yet introduced online banking services or are underutilized.

Table 6: Results of simple regression model for perceived ease of use and usefulness of online banking

Model	Coefficient			Correlation	R-squared
	b	t-statistic	p-value		
Constant	2.627	21.113	<.001	.437	.191
Ease of use	.379	11.153	<.001		

5.3.2 Perceived usefulness

H3: *Perceived usefulness is positively related to the preparedness of Libyan banking consumers to adopt Internet banking*

The correlation between the advantage of internet and adoption of internet banking is found to be positive and moderate (correlation=0.562), as shown in Table 7. As a result, the fitted model can interpret 31.6% of variation in adoption of internet banking. By looking at the effect of usefulness on adoption, the estimate is observed to be positive and very highly significant (b=.519, t=15.623 and p-value<0.001) and, hence H3 is strongly accepted.

Table 7: Results of simple regression model for usefulness of online banking and adoption of internet banking.

Model	Coefficient			Correlation	R-squared
	b	t-statistic	p-value		
Constant	1.975	15.064	<.001	.562	.316
Usefulness	.519	15.623	<.001		

5.3.3 Support

H4: *The level of support available to consumers is positively related to perceived ease of use*

The support offered by banks is not found to have a positive strong correlation with the ease of using online banking (correlation=.215), as shown in Table 8. Consequently, the goodness of fitted model is very low (about 4.6%). On other hand, the support factor result shows a positive effect on the ease of using online banking with a high level of significance (b=.213, t=5.051 and p-value=<0.001) and, hence H4 is accepted.

Table 8: Results of simple regression model for support and ease of use

Model	Coefficient			Correlation	R-squared
	b	t-statistic	p-value		
Constant	1.975	15.064	<.001	.562	.316
Usefulness	.519	15.623	<.001		

Table 4: Descriptive statistics for security

Statements	SD	D	N	A	SA	Med
Using online banking is financially secure	10.4	16.4	33	32.4	7.9	3
I am not worried about the security of online banking	7.2	20.5	30.7	34.5	7.2	3
I feel secure putting my personal information on the bank's website	10.4	22.6	26.4	32.6	7.9	3
Online banking is a safe place to do my banking rather than visiting actually the branch	8.7	14.5	28.2	36.3	12.2	3
I feel secure about online banking even though I have little knowledge of it	8.5	16.4	31	34.2	9.8	3
Overall						3

3.3. Simple Regression Analysis

The researcher supplied simple regression analysis to test the hypothesis of the study. The analysis will allow the researchers to determine a simple linear regression model via any two variables (dependent and independent variables) mentioned in the hypothesis.

5.3.1 Perceived ease of use

H1: Perceived ease of use is positively related to the preparedness of Libyan banking consumers to adopt Internet banking.

According to the results shown in Table 5, the degree of simple correlation is 0.437 which is positive, but somewhat low. The fitted model is able to explain 19.1% of the total variation in adoption of online banking. The regression effect resulting from the ease of use is positive and very highly significant ($b=0.379$, $t=11.153$ and $p\text{-value}<0.001$) and, hence H1 is strongly accepted with level of significance equal to 0.001.

Table 5: Results of simple regression model for perceived ease of use and adoption of online banking

Model	Coefficient			Correlation	R-squared
	B	t-statistic	p-value		
Constant	2.627	21.113	<.001	.437	.191
Ease of use	.379	11.153	<.001		

H2: Perceived ease of use is positively related to perceived usefulness of online banking

Unlike the adoption of online banking, the degree of correlation here between the ease of use and the usefulness of online banking is higher, which is .627 (good). Also, the interpretation ability of fitted model reaches 39.4%. The effect ease of use factor will statistically lead to the usefulness as shown by the results ($b=.582$, $t=18.526$ and $p\text{-value}<.001$) and, hence H2 is statistically accepted.

Regarding online banking, the results given in Table 2 reveal that only a small number of participants show a negative attitude towards the benefits of adopting online banking. In other words, the percentage of those respondents who strongly do not accept online banking as a useful method is lower than 6% for the each statement. The percentage is slightly higher, between 5%-9%, for those who disagree with the usefulness. The highest concentration of answers is noted to be for the disagreement with usefulness, namely agreement is represented by 50% of participants. Then, attention is paid to strong agreement with usefulness, which is between 20%-30%. As a result of the median, the different underlying benefits of online banking receive a great appreciation from the participants. Overall, the participants agree with the usefulness of online services. Accessible

Table 2: Descriptive statistics for usefulness of online banking

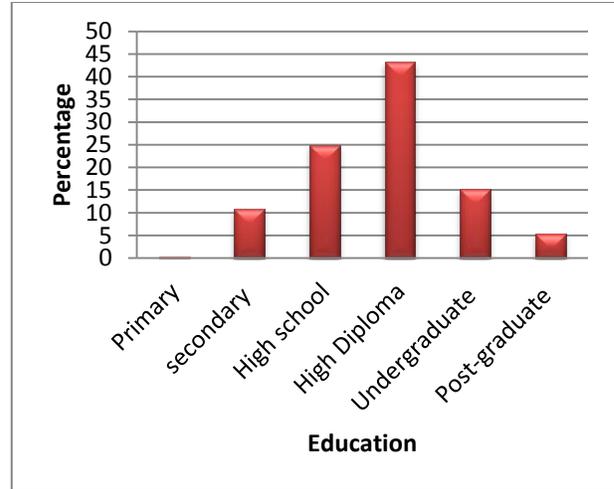
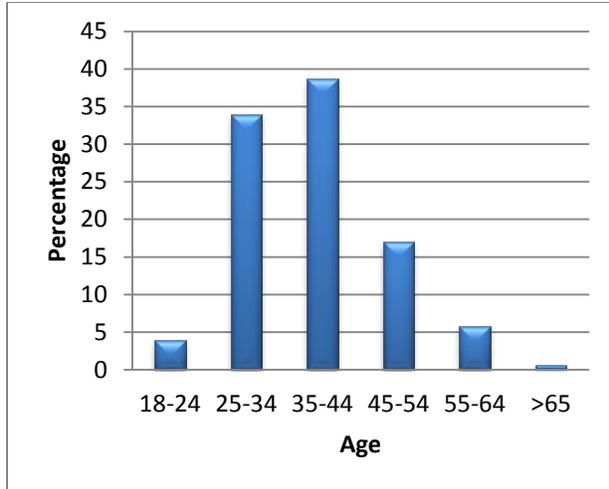
Statements	SD	D	N	A	SA	Med
Using online banking enables me to accomplish banking services more quickly	3.4	8.7	12.5	49.6	25.8	4
Using online banking improves my banking performance	3.8	7.4	14.7	50	24.2	4
Using online banking increases my productivity	5.1	7.2	20.8	45.3	21.6	4
Using online banking makes it easier to do banking services	4	6.4	14.9	49.7	25	4
I find online banking useful	3.8	4.9	11.3	49.8	30.2	4
Overall						4

As the encouragement of using online banking is an important factor, Table 3 shows a set of statements measuring this factor. The participants are noted to disagree with the statement that 'online bank enables me to feedback my complaints in reasonable time' where 23.1% and 27.4% respectively of respondents strongly disagreed or agreed with this statements, with a resulting median of 2 (Disagree). For the remaining statements, the resulting median is 3, indicating that participants feel neutral in regard to this aspect. Therefore, as the overall median is 2, no obvious trend can be seen by the participants in terms of the support factor.

Table 3: Descriptive statistics for support

Statement	SD	D	N	A	SA	Med
The bank personnel are committed to support me using online banking services	13.7	20.3	30.7	29.4	5.8	3
Help facilities to use online banking are available on the bank website	14.9	24	32.5	21.4	7.2	3
The bank's personnel help and support with training in how to use online banking	18.5	22.5	27.2	26	5.8	3
The bank website provides customer services support 24/7	20.8	25	30	17.7	5.6	3
The online bank enables me to feedback my complaints in reasonable time	23.1	27.4	30.8	13.2	5.5	2
Overall						3

The factor of online banking security is measured by five statements given in Table 4. All the percentages of the statements are distributed among disagreement, neutral and agreement scale, and hence the resulting median is found to be reflecting the neutrality. Overall, online security does not receive obvious attention as shown by the median.



The lowest percentage is found for the youngest group represented, namely, 18-24 years (approximately 3.9%). Regarding the education level, the highest percentage (approximately 43.3%) is observed for the high diploma, followed by high school (approximately 24.9%) and undergraduate university (approximately 15%) The participants holding postgraduate university represent only 5.4%. The result shows that about 88% of participants can access the internet, while 12% cannot.

3.2. Exploratory results

The results provided in Table 1 demonstrate the level of agreement—Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), Strongly Agree (SA)—with the ease of using the internet for banking services. For each statement measuring the ease of use, the percentage of participants who strongly disagree with this question is very low, where it is noted to be lower than 5 %. The strong disagreement percentage reaches the lowest value, about 4.9%, for the statement ‘learning to operate online banking is easy for me’. Also, the percentage for those who disagree with the ease of use is low, namely between 7% - 15%. The majority of participants agree with the statements measuring the ease of use (between 40% - 45%). The majority of participants (45.1% and 44% respectively), agree with the statements ‘learning to operate online banking is easy for me’ and ‘I find online banking flexible and interactive’. Since the resulting median is found to be 4 for each statement, the participants agree with these statements. Overall, the participants are in agreement regarding the ease of using the internet as a tool for banking services.

Table 1: Descriptive statistics for ease of use

Statements	SD	D	N	A	SA	Med
Learning to operate online banking is easy for me	4.9	7.5	19.2	45.1	23.3	4
I find it easy to get online banking to do what I want to do	7.8	14.9	19.8	39.5	18	4
My interaction with online banking is clear and understandable	8.3	10.2	26.5	39.9	15.1	4
I find online banking flexible and interactive	9.5	9.8	22.5	40.2	17.8	4
I find online banking easy to use	8.3	10.2	18.3	44	19.1	4
Overall						4

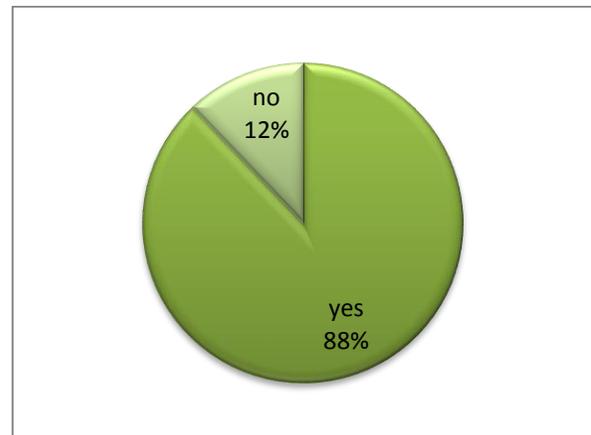
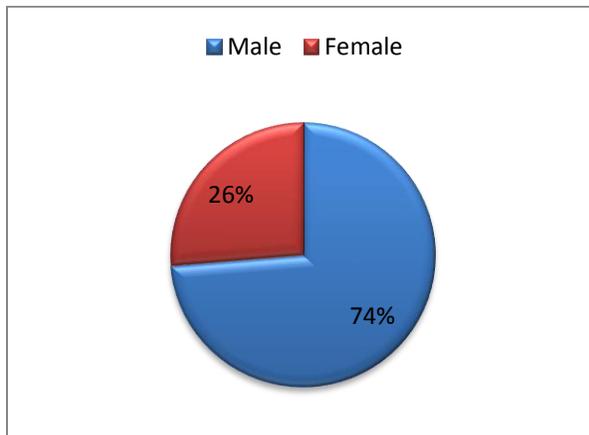
hypotheses. The data-set are to be analysed incorporating statistical software called SPSS. To present and describe the data obtained clearly and methodically, two main data analysis methods were used; namely exploratory data analysis and simple regression analysis.

Simple linear regression technique is concerned with determining a statistical model between a given dependent variable and an independent variable. T-test is used to determine the significant effect of independent variables on dependent variables. If the p-value obtained by t test for a particular independent variable is smaller than the level of significance, which is 0.05, it can be seen that the independent variable has a significant effect. Notice that if the sign of coefficient is positive, then there is a positive effect, otherwise the effect will be negative. A simple correlation is used to measure the degree of association between two variables used by each hypothesis. Furthermore, R-squared ($0 < R\text{-squared} < 1$) is computed to assess the fitted model quality. Notice that the fitted model is reliable as long as the values of R-squared is close to one.

3. Results and discussion

3.1. Data characteristics

In this section, the sample characteristics are represented by percentages using pie-charts and bar-charts in order to explore some interesting features of the participants. The collected data is represented by 74% male and 26% female. As shown below the highest percentage of age groups is observed for 35-44 years (approximately 38%) and 25-34 years (approximately 34%), followed by 45-55 years (approximately 17%).



internet access

1.1. The hypotheses

The hypothesis in this study is a temporary speculative solution to answer the research questions posed to provide an interpretation of the realities of the problem scientifically. In addition to following the rules when drafting this methodology and hypotheses, 'assumptions' were selected and verified so that eventually solutions to the problem can be reached. Hypotheses are the first source of knowledge we gain and the starting point and a general principle that the researcher uses to measure the research problem (Creswell 2013).

The aims of this research is to build hypotheses or theories through direct observation, with the assurance that intellectual production is the most important source for the formulation of scientific hypotheses (WFE 2013c). Formulation of hypotheses in this research serves the following purposes:

1. The researcher expects that these hypotheses will provide an effective solution to the problem.
2. The hypotheses derived from the foundations of the theory emphasize the feasibility of scientific evidence tested.
3. The hypotheses testable, which were not of the public that it is impossible to verify.
4. The hypotheses have been formulated concisely and clearly.

Based on previous studies, and to generate a new insight into Internet banking adoption among customers of Libyan trade

1. **H1: Perceived ease of use is positively related to the preparedness of Libyan banking consumers to adopt Internet banking.**
2. **H2: Perceived ease of use is positively related to perceived usefulness of online banking.**
3. **H3: Perceived usefulness is positively related to the preparedness of Libyan banking consumers to adopt Internet banking.**
4. **H4: The level of support available to consumers is positively related to perceived ease of use.**
5. **H5: The perceived level of security is positively related to perceived usefulness.**

2. Methodology

In this study, the data-set was collected via 537 questionnaires distributed in two capital cities in Libya (Benghazi & Tripoli) where almost 65% of Libya's population resides. The questionnaire consists of closed end questions. The first stage of the data analysis is to record the responses for each question. The second stage is to classify each of the responses. Subsequently, the third stage deals with the development of the research questions and testing of the research

5. Facilitate the handling of accounts in all branches, and notification using SMS with the support of banking services through the Internet.
6. Support to communicate with the basic components of the NPS and directly support communication with the SWIFT system.
7. Enable Libyan banks to effectively implement policies and standards such as risk credit and anti-money laundering(CBL 2012).

1.3.2. The need for internet banking in Libya

Increasing demand from the international banking community is placing significant pressure on Libyan banks to be electronically ready (LibyanNewsAndViews 2010).The location of Libyan banks has also created a pressure for connecting the headquarters with their branches electronically, rather than handling cash and paper manually (CBL 2009). Amongst the Arab nations, Libya has a reputation for having the finest bankers but the worst banking services (Libyan Investement 2007). E-banking technology has not yet found its way to the Libyan banking sector: despite that, most banks have been established E-channels to serve their customers via an internet network (LibyanNewsAndViews 2010). Basic electronic banking facilities such as automated teller machines (ATMs) and telephone banking are limited in Libya and, more interestingly, Libyan banks still rely on manual banking methods to undertake their daily banking activities (LibyanNewsAndViews 2010). However, the adoption of e-banking facilities is essential for Libya's economic reform (Abukhzam & Lee 2010).

2. The research model and hypotheses

The study model has been designed based on the relationships between the four constructs (Perceived Ease of Use , Perceived Usefulness , Support and Security). The TAM model has been used to clarify factors influencing users' approach toward acceptance of technology (Mun & Hwang 2003). The model is an extension of the Technology Adoption Model) which measures an person's intention to adopt a technology. There are five relationships to be examined and formulated as hypotheses.

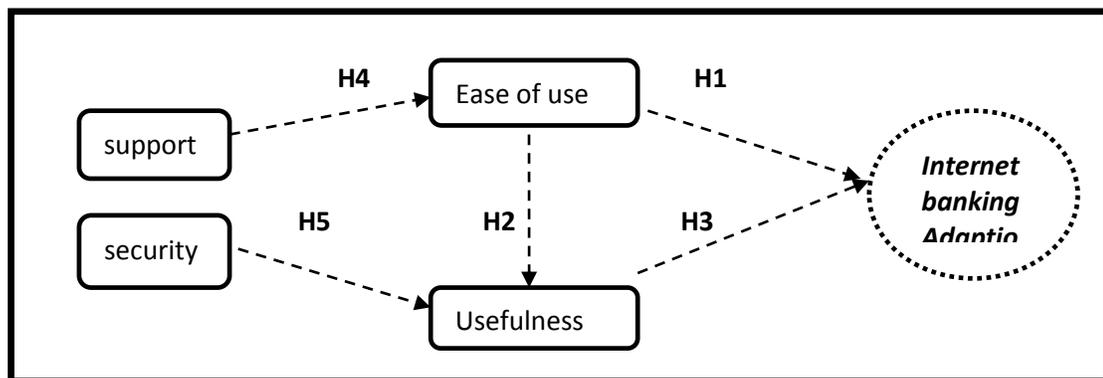


Figure (1): Research model

In theory, individuals' attitudes and behaviour are the main factors impacting their decision to use Internet banking services. According to Echchabi (2011) an individual's attitude towards internet banking services has a significant positive influence on the intention to use online banking services (Echchabi 2011).

1.3. Technology in the Libyan banking sector

In recent years Libya has embarked on economic reforms in many areas, especially the banking system, and this was manifested through the issuance of laws and regulations to facilitate the process compatibility with environment variables in banking and this is seen as part of the transition to a market economy and integration into the global economy (Ronald B & John 2008). Perhaps the most important new idea that has emerged is entry into so-called electronic banking. Through this next section we try to highlight the most important technologies used in the banking system and what role that technology plays in providing electronic banking services as a modern trend for the development and modernization of banks in Libya (Hamed 2010).

2.3.1 The national payments system

The Central Bank of Libya (CBL) has taken steps towards the development of the banking sector and remains cognizant of global developments. In particular it launched the project National Payments System (NPS) and prepared its technical studies and strategic vision (CBL 2012). The Project of NPS was established in 2008 with the aim of maintaining the level of banking service. Speed of completion of the banking transaction with providing a secure system for transmission of these transactions can be achieved only through the transition from a manual system to an electronic system in the implementation of banking operations (CBL 2012). The implementation of this project saw important developments in payment systems in recent years and has come to rely on advanced applications, allowing the development of electronic means of payment. This has also contributed to the diversity and the speed and accuracy of the banking services and has also opened new investment horizons for inside and outside investors. The NPS includes the implementation of systems such as Communications and Networks, Real Time Gross Settlement System, Automated Clearing House, Debit system, POS and cards (ATM/POS, CMS), Automated Check Processing, Core Banking System and Data Centers. The NPS will enable the Libyan banking system to provide distinct services to customers (CBL 2012), including:

1. Extracting consolidated financial centers to customer accounts, and the provision of service pay utility bills automatically.
2. Increase investment opportunities for clients through the possibility of the implementation of financial transfers automatically.
3. Supplying to major customers (investors and companies) electronic files containing daily movements.
4. Increase the speed of response time by banks to the requirements of the market and customers, and also support 24 hour banking services throughout the week.

attitudinal factors such as features of the web site and perceived usefulness emerged as factors that encourage people to adopt internet banking in Thailand. According to this study, perceived behavioural control, namely 'External environment', is the most significant impediment to adopting online banking. Additionally, other significant factors include gender, income, education level, internet experience and internet banking experience (Jaruwachirathanakul & Fink 2005).

Another study conducted was in Saudi Arabia by Al-Somali et al in 2009. The study sought to identify the factors that encourage customers to adopt online banking based on the technology acceptance model (TAM) and incorporated some extra important control variables. The results show that the quality of the Internet connection, the awareness of online banking benefits, the social influence and computer self-efficacy all have a significant effect on the perceived usefulness and perceived ease of use of online banking acceptance. In addition, education, trust and resistance to change are significant factors impacting on the Saudis' attitude towards the adoption of online banking (Alsomali et al. 2009).

In 2012 a study by Mansumittrchai and Chiu focused on identifying the characteristics of UAE consumers and their attitudes toward internet banking. The study revealed seven features, namely, compatibility, difficulty, security, trust, third party concern, status, and human contact impacted on internet banking adoption in the UAE, and showed that adopters and non-adopters differed in their attitudes toward three factors of adoption: compatibility, trust and human contact. An interesting result was that human or physical contact and trust were the most important factors for non-adopters (Mansumittrchai & Chiu 2012).

In 2013 Lim conducted a study which identified specific strategies that bank customers could follow to maximize the adoption of internet banking in Manila, including online banking users and non-users based on their gender, age, civil status and education. The study examined factors affecting the approval of online banking usage in the Philippines. The results showed that determinants such as perceived usefulness and perceived ease of use positively affected the intent to use online banking. This research recommended that awareness of the determinants affecting the intention to use online banking is important to the commercial banks to ensure they are competitive in the contemporary banking industry (Lim. 2013).

According to Riffai et al (2011), 'In Oman, there are deep rooted cultural and religious factors that cause consumers to question the acceptance of new technology'. Through the use of technology acceptance models, the research explores the factors that influence Omani consumer acceptance of internet banking. Riffai et al (2011) said that 'what is interesting is that the market profile is skewed to middle aged users, with social standing and "herd" mentality does not affect the adoption of the technology'. The findings of this study are significant in that trust, usability and perceived quality are deemed key drivers. This, combined with the emerging mobile savvy younger generation, poses an interesting challenge for the future of the banking sector in Oman, and implies a need for the sector to rethink the strategic use and approach to implementation of online banking in a way that is complementary to the cultural and ethological dimensions of the market. Riffai et al (2011) suggest that the banking sector will need to manage the covert tension between technology driving, and the Omani culture, religion and tradition that demands face-to-face interaction (Riffai et al. 2011).

banks (Dabholkar 1996). This was followed by telephone banking in the 1980s (Ahmad & Buttle 2002). In the 1990s Internet banking emerged, allowing banks to extend their existing distribution channels electronically (Tan & Teo 2000).

E-channel adoption is a key issue for banking in regards to reducing operational costs and saving time. About \$30 million per year was the estimated cost saving from E-commerce, Another service sector that has profited from the e-commerce boom is package delivery carriers. Spending on package delivery services jumped 10% in 2017 (MH & L, 2017). Commercial organizations employ E-banking services to cross-sell financial products and banks energetically recommend and promote financial tools such as investment, saving or credit products through e-banking channels (Hoehle et al. 2012). E-banking assists consumers to adopt banking products which fit best to their personal requirements and enables individuals to make real-time financial decisions conveniently, and independently of time and location such home. E-banking can also include decision support functionality (Mäenpää et al. 2008).

Less attention has been paid to IT in developing economies and in particular in Libya. While much information technology (IT) literature focuses on developed economies, E-banking offers great value for developing nations such as Libya—which is yet to take advantage of this technology despite the world-wide availability of E-banking (Vyas & Rajasthan 2012). This research aims to understand the adoption of E-banking services at the individual level so as to assist banks and their customers in Libya to better enjoy its many benefits.

2. Literature review

1.1. Internet banking

For many organizations e-commerce has become a main aspect of their business strategy (Chong et al. 2010). The Internet has spread widely, and it is inevitable that the banking industry in Libya must provide their customers with e-banking services. The banking system in Libya continues to be commonly conducted through visits to a retail bank branch and interacting with a bank teller (Wang et al. 2003). Internet banking gives customers the opportunity to perform a great number of banking services by electronic means (Tan & Teo 2000). Banking services are a significant infrastructure for other services and it is important for banks to manage themselves efficiently through the application of Internet banking (Chong et al. 2010).

1.2. Factors impacting on internet banking adoption

Many studies to date have emphasized the adoption of online banking by using different approaches. They have studied the acceptance of online banking in different locations and by using different theories to examine several factors that have a significant influence on the use of online banking services. Stefan (2000) as cite Guraau (2002) in stated that 'by using the internet which has the feature of reduced costs and increased conveniences, people can contact their banks and accomplish their banking transactions 24 hours a day in seven days a week' (Guraau 2002).

Jaruwachirathanakul and Fink (2005) conducted quantitative research to identify the factors that promote consumers' acceptance of internet banking services in Thailand. The finding shows that

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Abstract

The provision of Internet banking services is increasing worldwide in the banking sector, particularly in industrialized nations. Nevertheless, the situation is different in developing nations such as Libya. Libyan banks are slowly recognizing the potential benefits of online banking systems to improve banking services, but have not accepted the new innovation within its banking services strategy. This paper reports on research based on the Technology Acceptance Model (TAM). An assessment of literature on E-banking services adoption shows that there has been scant research conducted on internet banking adoption in developing nations, including Libya, compared to developed nations. Therefore, this study aims to fill this gap by exploring the important factors affecting Libyan banking customers' attitudes towards internet banking technology.

Using Structural Equation Modelling (SEM) on data of This study, which draws on current literature on technological changes in the banking sector and the responses from 537 bank customers of Libya's major commercial bank This study found that perceived ease of use and perceived usefulness have a major effect on the adoption of internet banking. Furthermore, results show that the influence is somewhat low in regard to security and support by the banks. Finally, potential strategies that can guide successful internet banking implementation in the Libyan banking sector are outlined. In addition to this, Conclusions and recommendations for future research are also provided.

Keywords: Internet banking, commercial bank, Libya.

1. Introduction

Since the 1970s, a new information and communication technology (ICT) within the banking industry has had a major impact on customer service (Hoehle et al. 2012). ICTs such as internet banking have allowed banks to deliver services electronically and through multi-channels (Black et al. 2002). Innovations in delivery channels include the Automated Teller Machine (ATM), Phone-banking, Telebanking, PC banking and Internet banking (Nasri & Charfeddine 2012). The self-service technologies in the banking sector became available in the 1970s (Railton 1985) when the first Automated Teller Machines (ATMs) were installed in