



Journal of Internet Banking and Commerce

An open access Internet journal (<http://www.icommercentral.com>)

Journal of Internet Banking and Commerce, May 2017, vol. 22, no. S8

Special Issue: Mobile banking: A service provider perspective
Edited By: Mihail N. Dudin

AN OVERVIEW AND PROPOSAL FOR ANALYSIS OF THE EFFECTIVENESS OF HUMAN FACTORS IN DUBAI E-BANKING SYSTEM

RAWAD ABDULGHAFOR*

**Department of Information Systems, College of Information and
Communication Technology, International Islamic University Malaysia,
53100, Kuala Lumpur, Malaysia**

Tel: 0060183801058;

Email: raaac2004@yahoo.com

AIYSHA JASIM

**Department of Information Systems, College of Information and
Communication Technology, International Islamic University Malaysia,
53100, Kuala Lumpur, Malaysia**

AKRAM ZEKI

**Department of Information Systems, College of Information and
Communication Technology, International Islamic University Malaysia,
53100, Kuala Lumpur, Malaysia**

Abstract

Nowadays, every transaction is done electronically through various e-channels like, ATMs, credit/debit cards, internet banking, mobile banking, telebanking, EFTs, etc. There are many factors that attract people to use the internet banking and encourage increasing the customers for the bank. In this paper, the human factors (factors from e-banking customers) are extracted by extensive literature review then statistical analysis is to be suggested to measure these factors. The study is to be conducted in Dubai and the valid responses are to be analyzed by Partial least squares (PLS) technique of analysis. Independent samples Test are to be carried out to find the effect of customers familiar with e-banking factors. The analysis is to reveal security awareness among the customers of e-banking in Dubai.

Keywords: Human Factors; e-Banking; Risk; Analysis

© Rawad Abdulghafor, 2017

INTRODUCTION

The concept of banking has drastically changed where technology is the most dominating factor which helped banks to have mixed knowledge with innovative products/services to win the competitive market. The Internet has offered organizations perfect and more state-of-the-art methods to conduct their engagement in activity application [1], and one business sector which has been highly concerned is the economics sector. The Internet represents a polished electronic delivery channel, allowing customers to perform faster and more rational economics transactions, and offering new methods of reaching dressed to the teeth clients [2,3]. Online investment has proposed a dynamic “value added” means which attracts new customers and eliminates the cost of handling transactions manually in a highly volatile economics environment. It provides boot be expected an easy substitute which reduces the need to chat the physical sector in edict to perform banking transactions, offering customers contrary to the ability to conduct any banking services anyplace and at any time [4].

In simple words, e-banking implies provision of banking products and services via electronic delivery channels. Electronic banking has been around for pretty some time inside the form of computerized teller machines (ATMs) and cell phone transactions. In extra recent times, it's been converted by way of the internet - a brand new delivery channel that has facilitated banking transactions for each customers and banks. For customers, the internet offers faster get entry to, is greater handy and available around the clock. E-banking implies provision of banking products and services through electronic delivery channels. Electronic banking has been around for quite some time in the form of automatic teller machines (ATMs) and telephone transactions. In more recent times, it has been transformed by the internet - a new delivery channel that has facilitated banking transactions for both customers and banks. For customers, the internet offers faster access, is more convenient and available around the clock.

The first online banking services based on the Internet were provided by Stanford Federal Credit Union (SFCU) in October 1994. Several literatures suggest that internet

banking started with simple functions like real time access to information about interest rate, checking account balances and computing loan eligibility. This further postulate that, these services have updated to online bill payment, transfer of funds between accounts and cash management services for corporate organizations and individuals. It is clear that as banks expand in to internet banking, there is need to focus greater attention to fail - safe security arrangements and systems to safeguard against security threats. This notion is supported by the Federal Financial Institutions Examination Council (FFIEC) that notes that, financial institutions offering Internet - based products and services to their customers should use effective methods to authenticate the identity of customers using those products and services [5].

E-banking has moved actual banking behavior towards neo-classical financial theories of marketplace functioning. Because of absolutely the transparency of the market, clients (both commercial enterprise in addition to retail) can evaluate the services of numerous banks extra easily. For instance, on the net, competition is simplest one click on away. If customers are not satisfied with the products, costs or offerings provided via a particular financial institution, they're capable of exchange their banking associate a whole lot greater effortlessly than within the physical or actual financial institution-purchaser courting. From the banks' factor of view, use of the internet has extensively decreased the physical prices of banking operations. As mentioned by using Turner development in statistics technology has slashed the charges of processing records, at the same time as the net has facilitated its transmission, thus facilitating trade inside the very essence of the banking business [6]. Round the sector, electronic banking services, whether or not added online or thru other mechanisms, have unfolded speedy in latest years. It need to be noted that the impact of e-banking isn't always constrained to industrial and advanced emerging economies. Even in international locations with underdeveloped banking systems, e-banking has offered many new commercial enterprise opportunities [7].

Looking into banking in Islamic countries, there is clear evidence that Internet Banking is gaining momentum in Islamic countries around the world. It is reported that fourteen percent of the Internet users in Arab countries where Internet banking is available and have registered for it. Furthermore, it is encouraging to learn from [8] that the adoption rate of Internet banking in three Arab countries namely Bahrain, the United Arab Emirates and Kuwait matched or exceeded the US adoption rate of 17%.

However, empirical evidence has shown that online banking offering do not appear like as giant within the UAE as in Europe and the USA and that there are many obstacles stopping the unfold of adopting this era in the Arab global and in the UAE [4].

There are some of constraints - related to social and infrastructure troubles that ought to be taken into consideration while evaluating the development of on line banking in the Arab international. First, whilst many Arab banks can be technologically capable of offering online banking services, the telecommunications infrastructure in a few countries remains poor. Second, internet penetration inside the vicinity remains notably low, which won't encourage the funding, required broadening online banking. Subsequently, many bank clients use this technology only for non-transactional

activities, such as viewing account statements and balances, whilst financial institution managers want clients to use kind factors of online banking [4].

The UAE banks at the moment are coming into a crucial level of banking improvement and harmonization related to global competition. Over current years the UAE banks have moved closer to western banking fashions introducing new products and services past the conventional banking sports of attracting deposits and using them to provide loans. An imminent new banking regulation is predicted to completely liberalize the financial and banking sectors in the UAE. In addition, the implementation of the three pillars of the Basel II capital accord, (solvency ratio, marketplace subject and supervisory motion), is predicted to be effective in 2007. This could require that banks (global huge) have the era to capture, report and store data, and decide the minimal stage of capital required. As income in step with capita rises, information era improves, and telecommunications liberalizes, the UAE banks now have the possibility to transport towards western banking models where an awful lot of the labor in depth services is actually added on line. Stepped forward excellent of alternate offerings and get entry to extra accurate facts simultaneously improving the opportunities of disclosing any ability data malpractices has improved the performance and security of the banking enterprise. The UAE banks can now benefit from those new possibilities by using exploiting the competitive benefits that had been no longer attainable with the aid of preceding traditional banking methods. Accelerated productivity and slicing of transaction fees are the maximum obvious blessings of e-banking. The dramatic distinction in price and pace among conventional 'brick-to-brick' banking and net-mediated monetary 'brick-to-click' banking services and related statistics shipping has led to fast boom of online payments, e-banking and on line credit hazard management, as a consequence bringing about profound changes inside the whole machine of monetary offerings and intermediation. On line versions of nearly all existing price techniques are appearing globally [9].

The main purpose of this study is to identify factors which influence user behavior to use e-banking and to find out different strategies for the full customer satisfaction. The work here discusses the behavior of customer when it comes to the use of e-banking. Moreover, the work is based on conceptual model where factors are being discussed which in turn influence customers to use e-banking.

BACKGROUND OF THE PROBLEM

The lack of factors knowledge that influence the clients decisions weather to use such technology or not will reduce the number of e-banking users or for example, if the applications interface is complicated and difficult for the old people to deal with , for instance if the transaction do not complete they will feel un safe.

Little research had been done in finding advantages, disadvantages, risk and other factors which influence the decision of customers whether to use e-banking or not [10]. In this work, all these factors will be explained to find out the effectiveness of internet banking and security strategies in Dubai. These factors will be modulated to increase the use of the Internet Banking.

Objective

The main aim of this study is to find the perception of customer's familiarity with e-banking. In general, this work is to present the human factors that can analyze security awareness among the customers to improve and strengthen customers trust on e-banking. Therefore, the specific objective of this study is to investigate e-banking influencing factors of customers in Dubai.

Research Scope

This study focuses on proposing how to analyze effectiveness, strategies and security of internet banking. Questionnaires are suggested to be distributed in customers of different Dubai banks and are aware of internet banking. Quantitative research methodology will indicate also. Survey questionnaires will offer to distribute using online survey tool Survey Gizmo.

Research Significance

The significance of the proposed work is twofold, theoretical and practical. They are described as follows.

Theoretical Significance

The impact of human factors on e-banking will be found to be important by many researchers. However not many researchers have studied their impact to the banking sector when it comes to the e-banking. In the proposed work, different techniques will identify to address security of e-banking. Furthermore, the research discusses risk, effectiveness and uncertainty of e-banking.

Practical Significance

The factors will be found out in the proposed work along with the guidelines on how to control these factors so as to improve e-banking can be used by bankers. Bank managers can take advantage from this study to implement the strategy, security and effectiveness of the internet banking. In practicality bankers, can have a detailed view of the negative factors of e-banking like risk, uncertainty etc.

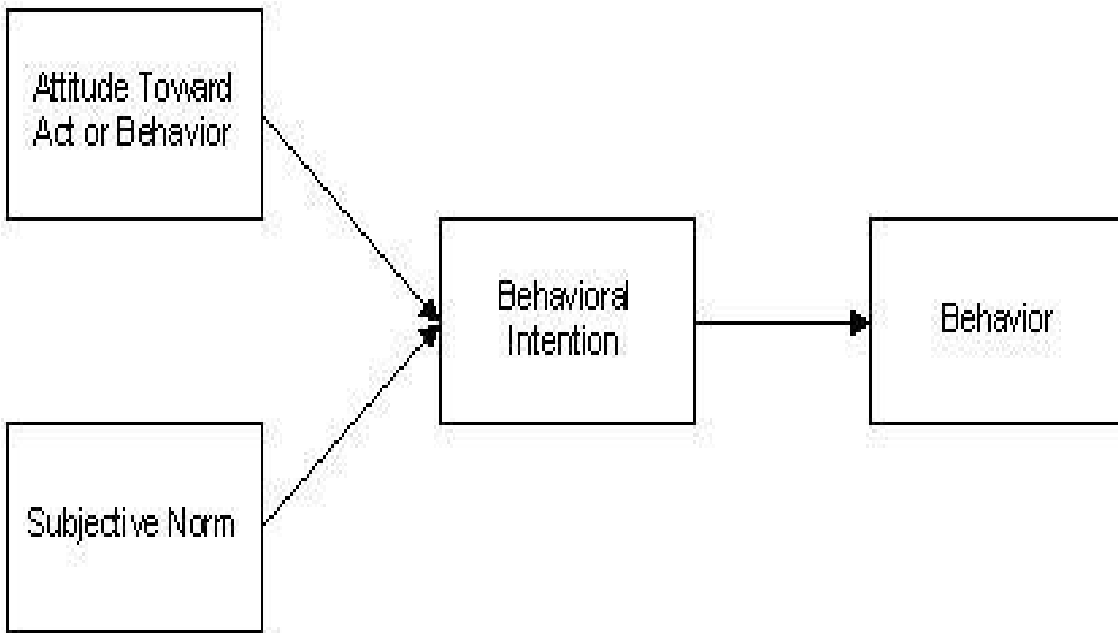
Technology Acceptance and Popular Models

In order to assist the development of an apt e-assessment system factors promoting user acceptance of technology needs to be uncovered. Some popular technology acceptance models like the Theory of Reasoned Action (TRA) [11], Technology Acceptance Model (TAM) [12], and Theory of Planned Behavior (TBP) [13] will be discussed briefly in the following sub-sections.

Theory of Reasoned Action (TRA)

Fishbein and Ajzen developed this model in 1975 and it acted as the precursor of the technology acceptance models developed later on. As per TRA (Theory of Reasoned Action), an individual’s intention can explain their acceptance of technology. Individual’s intention is in turn ascertained by their perception that most people who are significant to him think he should exhibit the behavior under consideration (subjective norm) and the individual’s positive or negative feelings towards the target behavior (attitude) [11]. The diagrammatic representation of the theory is given below (Figure 1).

Figure 1: Theory of Reasoned Action-TRA.



Technology Acceptance Model (TAM)

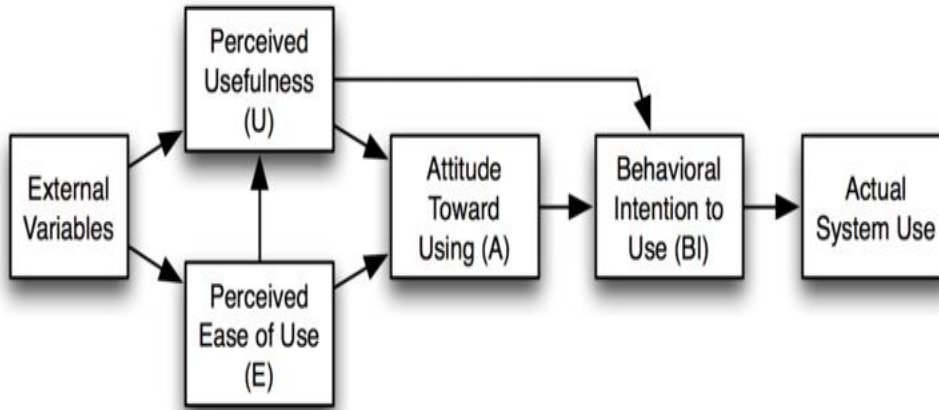
Technology Acceptance Model (TAM) is the most popular acceptance model that forecasts acceptance of technology at individual level. Davis developed it in 1989 [14] by deriving it primarily from TRA. In this theory two new constructs Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) were introduced. Davis defined PU as “the degree up to which a person believes that using a particular system would enhance his or her job performance” and PEOU was defined as “the degree up to which a person believes that using a particular system would be free of effort” (Figure 2).

The important findings of TAM are as follows:

1. PEOU directly affects PU.
2. Both PEOU and PU affect Attitude towards using the system.
3. Attitude affects Behavioral Intention (BI) that in turn determines actual system use.

The diagrammatic representation of TAM is given below:

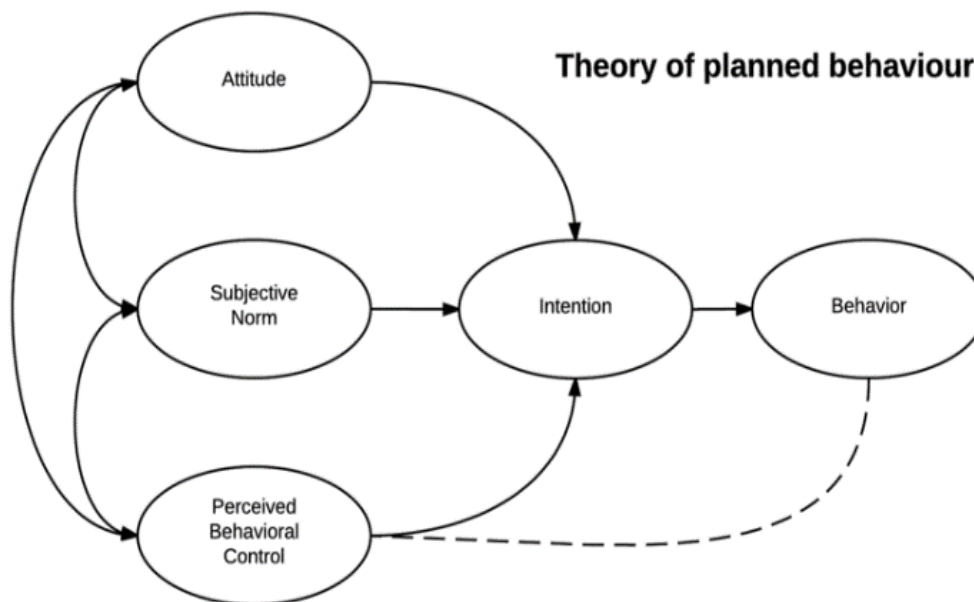
Figure 2: Technology Acceptance Model-TAM.



Theory of Planned Behavior (TPB)

Ajzen developed this theory in 1991 [13] by extending the Theory of Reasoned Action and by adopting self-efficacy from Social Cognitive Theory proposed by Bandura in 1997 [13]. The diagrammatic representation of the theory is given below (Figure 3).

Figure 3: Theory of Planned Behavior-TPB.



The descriptions of the constructs are as follows:

Attitude toward the behavior: it can be described as person's optimistic or pessimistic feelings about carrying out a behavior. It is ascertained through an evaluation of one's faith regarding the result arising from the behavior and an assessment of the appeal of these results.

1. Subjective Norm: it can be described as a person's view of whether people important to him/her think the behavior should be done or not.
2. Behavioral control: it can be described as an individual's perception of the effort required for performing behavior.

The Proposed Human Factors of E-Banking System

Perceived ease of use (PEOU) and perceived usefulness (PU): In this sub section, we discuss factors that will help us to answer our research questions. Since the major aim of this research is to find factors and understand their interconnections in promoting use of e-banking, we use the Technology Acceptance Model (TAM) as a base for this purpose. After discussing TAM we then introduce the constructs and propose hypotheses that would help us meet our research objectives.

It is important here to implement acceptance studies which can help us to reduce risks and are helpful in understanding. There are two levels where we can use this technology acceptance method, one at the organizational level and second the user i.e. individual level. If the unit of analysis is important, acceptance of technology plays a dynamic role if implemented [15]. An individual's technology acceptance is actually the psychological state of an individual with regard to his/her intensions and understanding of a new technology [16].

Now, we look into constructs that have been used in other studies that have tried to explain e-banking use.

Similarly, in our study we hypothesis that

H1: Costumers' PEOU directly affects their PU for an e-banking system.

H2: Costumers' PU of e-banking systems affects their BI to use the system.

H3: Costumers' PEOU of e-banking systems affects BI to use the system.

Convenience: Convenience (noun) is simply defined as the quality of one's comfort, purpose, for something which can increase comfort or saves time (American Heritage Dictionary, 1992).

Convenient (adj.) has been defined as-supportive to one's comfort, purpose or need. There comes no wait or travel when it comes to define convenient [17]. Convenience is one of the key matters with customer acceptance or rejection of a channel [18] empirically endorse that convenience has a great impact in adopting e-banking in Hong Kong. Similarly adoption research which has been done on self-service based technologies used in banking has identified convenience as one of the most important factors [19]. Convenience is one of the most important factors when it comes to e-banking adaptation. Lichtenstein et al. [17] indicate that time saving and 24/7 access appear to be the most important aspects of the convenience of Internet banking

services. Devlin [20] explains that as people become more time and leisure conscious, the convenience aspects of Internet banking will be increasingly valued.

Therefore, in this study we hypothesize that

H4: Convenience (CNVNC) to use e-banking systems has significant positive influence on Behavioral Intention (BI).

Internet Banking Risk

Using internet banking by a customer is affected by the availability of a computer system and the ability of the customer to easily use the computer to perform the transaction successfully in limited time without the effect of any risks involved [21].

Moreover IBR is also impacted by the perception of the customer's social circle about the usage of internet banking and the person's own intention towards internet banking [22].

H5: IBR will have a significant positive influence on Behavioral Intention (BI).

H6: IBR will have a significant positive influence on Perceived Ease of Use (PEOU).

H7: IBR will have a significant positive influence on Perceived Usefulness (PU).

Security and Privacy

Security and privacy are two important dimensions which play a dynamic role in e-banking adaptation and its satisfaction. Encryption technology is the most common feature at all bank sites to secure information privacy, supplemented by a combination of different unique identifiers, for instance, a password mother's maiden name, a memorable date, or a few minutes of inactivity automatically logs users off the account.

Besides, the Secure Socket Layer, a widely-used protocol for online credit card payment, is designed to provide a private and reliable channel between two communicating entities; the use of Java Applet that runs within the user's browser; the use of a Personal Identification Number, as well as an integrated digital signature and digital certificate associated with a smart card system [23]. Thus, a combination of smart card and biometric recognition using fingerprints offers a more secure and easier access control for computers than the password method [24].

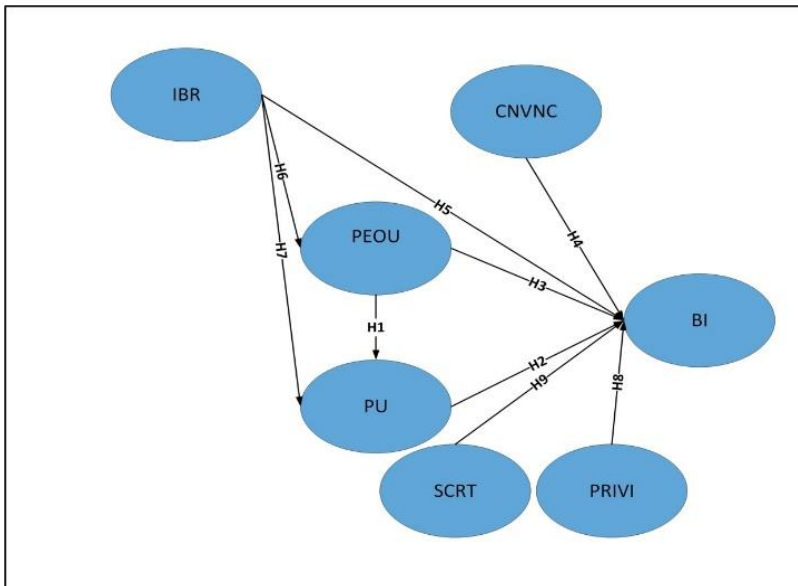
Hence, it is hypothesized that

H8: Security (SCRT) will have a significant positive influence on BI.

H9: Privacy (PRIVI) will have a significant positive influence on BI.

The Figure 4 below gives a graphical representation of the hypotheses discussed above.

Figure 4: The graphical representation of hypotheses.

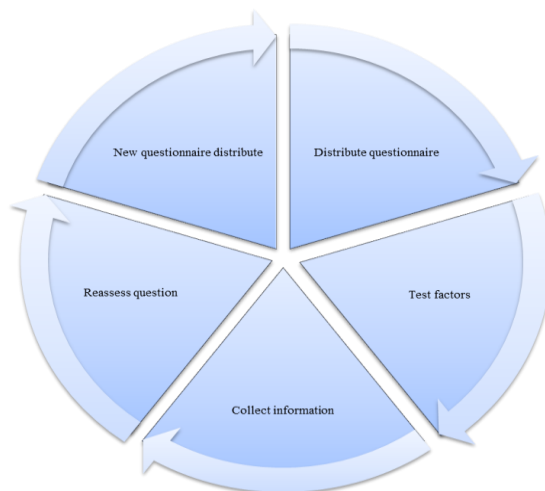


RESEARCH METHODOLOGY

Analysis Process

In order to define the factors which influence the adaptation of e-banking, will start at reviewing literature and examination users' behaviour, and highlighting the human factor in information security. A questionnaire was designed, and distributed to the respondents. Post the data collection, analysis of data was conducted. Figure 5 shows each step of the research process.

Figure 5: Analysis process cycle.

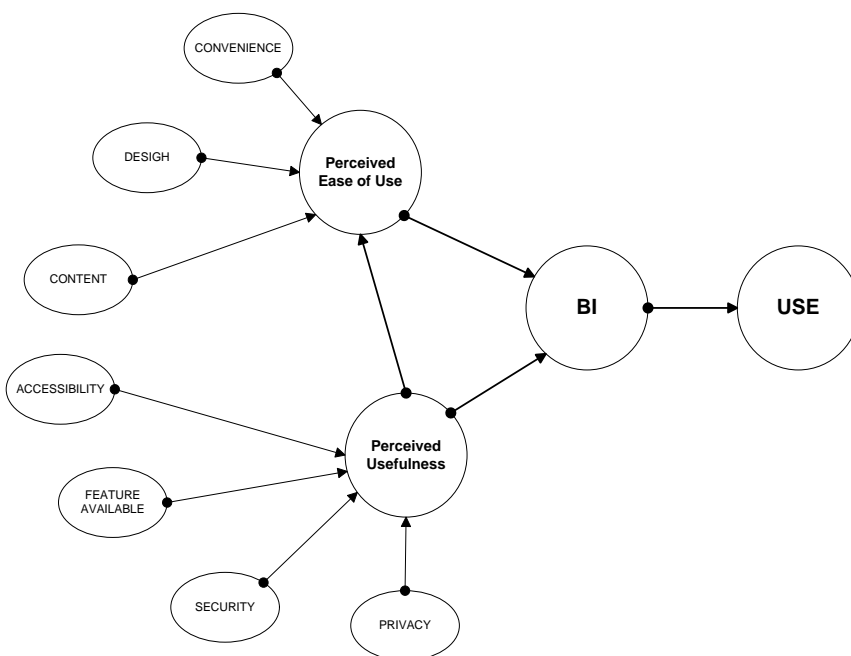


Research Process

The questionnaire consists are proposed of two parts; the first part is for collecting demographic data from the respondents and the second collects their response for the different factors effecting adoption of e-banking. In the demographics details the following data is suggested to collect Sex, Age, education and working experience.

In the Figure 6 all the human factors have been represented pictographically so as to present a broad overview of the situation.

Figure 6: Operational Framework



This study proposes to examine the factors affecting the adoption of e-banking services in Dubai. From the literature discussion above, seven factors are identified, which are accessibility, feature availability, security, privacy, design and content. These factors where then divided into sub categories.

Data Collection Method

Data collection was done through both online survey and paper based survey. The online survey questionnaire was developed using an online survey website „Survey Gizmo“. This website allows different types of questions, like multiple choices, Likert scale etc. to be added to the survey. It also has basic data analysis and reporting facilities. The survey was created on this website and the link was shared through email to my different contacts in UAE which covers almost every race, age, gender.

Data Analysis Techniques

In this sub-section, the data analysis process is discussed. This work will be exploratory in nature as it is a feasibility study done on factors influencing the adaptation of e-banking. The analysis done on the previous literatures has proven that this study is one of a kind and is very uncommon, hence confirming the exploratory nature of this study. Therefore, it is important to choose a technique that caters to such kind of research. Upon reviewing past literature available, one statistical technique stands out from the rest and that is Partial Least Squares (PLS) Structure Equation Modelling (SEM).

In the 1920's path analysis models first appeared in academic literature. PLS-SEM was developed by Herman Wold in 1960's. Initially it was mostly popular in chemometric but from the 1980's it started to be used in business research as well [25].

PLS-SEM is also called PLS-PM (PLS-Path Modelling) and it is component based estimation procedure. In simple words its algorithm can be explained by the following two iterative processes.

1. The measurement model is processed first; this determines the loads/weights.
2. The structural model is evaluated and the path coefficients are calculated.

PLS is good at explaining residual variance of latent variables and also for the manifest variables. This is the reason it is good at analysing exploratory models. Due to its flexibility with distributions, sample size and measurement scale, it is also referred to as a soft modelling technique. These are also the reasons that make it good for predictive research and new theory development which is one of the goals of this study [26].

PLS was selected for this research based on the following rules of thumb defined by [25].

1. for exploratory research or one in which existing structural model is extended use PLS-SEM.
2. If the structural model has many constructs and the relationships are complex then use PLS-SEM. This is clear from the research model derived.
3. If sample size is a constraint, then use PLS.

Sampling and Population

In this work since PLS-SEM is used for data analysis and hypothesis validation. Hence the minimum sample size will be determined by the following guidelines described by the rule of thumb of refs. [25,27].

1. The minimum sample size should be 10 times that of the largest number of formative items (indicators) in a construct.
2. Or, 10 times the largest number of structural paths affecting a dependent variable.

Since all the research constructs in this study are reflective as per the rule by Jarvis et al. [28], hence only rule '(b)' is applicable and minimum sample size is calculated to be 50. A total of 60 valid responses will be collected and analysed. Previous studies have also successfully used PLS-SEM with small sample size for technology acceptance studies, e.g. [29,30].

CONCLUSION

The banking industry plays a big position in assisting financial development via green monetary offerings. The e-banking in Dubai has fundamentally modified by expanding and improving the statistics era systems and quite a number of new electronic banking services had been advanced. All banks operating in Dubai have declared electronic commercial enterprise as one of the center techniques for the future development. On the identical time, e-banking popularity depends possibly on financial institution carrier excellent, patron preferences and pleasure. This paper proposes to accomplish an analysis the effectiveness of human factors in Dubai E-banking System. In fact, technology acceptance and popular models, effectiveness in internet banking, strategies for internet banking implementation and risk of internet banking have been presented in this work. The study recommends that future work, define the questionnaire and analyze data collection.

ACKNOWLEDGMENT

We would like to thank The Kulliyah of Information and Communication Technology (KICT) and the Research Management Center of the International Islamic University Malaysia (IIUM) for their supports.

REFERENCES

1. Laukkanen T, Sinkkonen S, Laukkanen P (2009) Communication strategies to overcome functional and psychological resistance to Internet banking. *Int J Inf Manage* 29: 111-118.
2. Dannenberg M, Kellner D (1998) The bank of tomorrow with today's technology. *Int J Bank Mark* 16: 90-97.
3. Sathye M (1999) Adoption of Internet banking by Australian consumers: an empirical investigation. *Int J Bank Mark* 17: 324-334.
4. Mouakket S (2008) Investigating the Factors Influencing Customers ' Adoption of Online Banking in the United Arab Emirates. *J Int Technol Inf Manag* 18: 361-384.
5. Council FFIE (2006) Authentication in an internet banking environment; Towards developing a strategy for fraud detection. *Int Conf Internet Surveill Prot* 1: 703.
6. Vijayan B, Shanmugam P (2015) Service quality evaluation of internet banking in Malaysiale. *J Internet Bank Commer Res Rev*.
7. Nitsure RR (2003) E-banking: Challenges and Opportunities. *Econ Polit Weekly*, JSTOR, pp: 5377-5381.
8. Halpern M (2015) *Politics of Social Change: In the Middle East and North Africa*. Princeton University Press.
9. Budd B, Budd D (2007) A Preliminary Empirical Investigation of 'Brick-to-Click' Banking Presence in the United Arab Emirates. *J Internet Bank Commer* 12: 1-7.
10. Fatima A (2011) E-Banking Security Issues-Is There A Solution in Biometrics? *J Internet Bank Commer* 16: 5.
11. Ajzen I, Fishbein M (1977) Attitude-behavior relations: A theoretical analysis and

- review of empirical research. *Psychol Bull* 84: 888-918.
12. Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Q* 13: 319-340.
 13. Ajzen I (1991) The theory of planned behavior. *Organizational Behav Hum Decis Process* 50: 179-211.
 14. Davis FD, Bagozzi RP, Warshaw PR (1989) User acceptance of computer technology: a comparison of two theoretical models. *Manage Sci* 35: 982-1003.
 15. Dasgupta S (2002) User acceptance of e-collaboration technology: an extension of the technology acceptance model. *Gr Decis Negot.*
 16. Hendrick HW (1987) 9 Human Factors in Organizational Design and Management. *Adv Psychol* 47: 347-398.
 17. Lichtenstein S (2006) Understanding consumer adoption of internet banking: an interpretive study in the Australian banking context. *J Electron Commer Res* 7: 50-66.
 18. Wan WWN, Luk C-L, Chow CWC (2005) Customers' adoption of banking channels in Hong Kong. *Int J Bank Mark* 23: 255-272.
 19. Black NJ, Lockett A, Winklhofer H, Ennew C (2001) The adoption of Internet financial services: a qualitative study. *Int J Retail Distrib Manag* 29: 390-398.
 20. Lever-Duffy JB, McDonald J (2011) Teaching and learning with technology. Boston, MA Pearson.
 21. Lee MC (2009) Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electron Commer Res Appl* 8: 130-141.
 22. Marr NE, Prendergast GP (1993) Consumer adoption of self-service technologies in retail banking: Is Expert Opinion Supported by Consumer Research? *Int J Bank Mark* 11: 3-10.
 23. Hutchinson D, Warren M (2003) Security for Internet banking : a framework 16: 64-73.
 24. Poon WC (2007) Users' adoption of e-banking services: the Malaysian perspective. *J Bus Ind Mark* 23: 59-69.
 25. Hair JF, Ringle CM, Sarstedt M (2011) PLS-SEM: Indeed a Silver Bullet. *J Mark Theory Pract* 19: 139-152.
 26. Vinzi VE, Chin WW, Henseler J, Wang H (2010) Handbook of partial least squares: Concepts, Methods and Applications.
 27. Chin WW (1998) The partial least squares approach to structural equation modeling. *Quantitative Methodol Ser*, pp: 295-336.
 28. Jarvis CB, MacKenzie SB, Podsakoff PM (2003) A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *J Consum Res* 30: 199-218.
 29. van Raaij EM, Schepers JJL (2008) The acceptance and use of a virtual learning environment in China. *Comput Educ* 50: 838-852.
 30. Venkatesh V, Davis (2000) A theoretical extension of the technology acceptance model: four longitudinal field studies. *Manage Sci* 46: 186-204.