Journal of Internet Banking and Commerce

An open access Internet journal (http://www.icommercecentral.com)

Journal of Internet Banking and Commerce, December 2017, vol. 22, no. 3

FRAMEWORK FOR MEASURING THE CONVENIENCE OF ADVANCED TECHNOLOGY ON USER PERCEPTIONS OF INTERNET BANKING SYSTEMS

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Abstract

Financial institutions, particularly banks, are one of the largest investors in the domains of information systems, and there are quite clear signs that these trends to overspread in the future. The advent and expansion of globalization and the development of information technologies pushed the banks to adopt advanced technology in order to launch new services. Banks have applied remote enabled service using the Internet to gain competitive advantage, increase efficiency, reduce costs and offer a variety of new services. Online systems make banking transactions easy and convenient, particularly for disabled people who may require special services. The main purpose of this current study is to examine the main keys to measure the merit perception of using Internet banking technology, as this advanced technology is considered as one of the principal motivations underlying the inclinations of individuals to adopt such a convenient technology. The model formulated and developed in this research study is an extension to the Technology Acceptance Model (TAM). The model was tested with a survey sample of 400 people

chosen randomly. The findings of the study indicate that all mentioned factors in the proposed model (CNV, SE, QI, AW, PEU, PU) have significant impact within prompting the use of Internet banking systems. Data analysis is based on the Statistical Package for Social Science (SPSS).

Keywords: **Internet banking; TAM; Perceived Usefulness (PU); Perceived Ease of Use (PEU); Convenience; Jordan**

INTRODUCTION

Over the past few decades, the world is undergoing an unprecedented evolution of information technology, which has affected the whole life. The phenomenon of the Internet and information technology have opened a new medium of communication for individuals and businesses and provided opportunities to communicate and get information in an entirely different way. Information technology has become an important factor for both industrial and service sectors. The service sector, particularly the banking industry, is constantly evolving; customers are increasingly unpredictable and service delivery is a turning point. Because of the growing use of the Internet and developing advanced technology systems globally, there has been an apparent increase in the usage of Internet banking system all over the world.

The increasingly competitive environment in the financial services sector along with globalization, liberalization and advanced technology revolution have opened the door for new efficient delivery channels as well as more innovative products and services in the banking industry. For instance, Internet banking services offer a variety of benefits conduct online transactions faster and more easily with self-service applications in terms of transfers between accounts, pay bills to utility providers and Internet purchasing. This also reduces operational costs for banking. For instance, face-to-face transaction with a human teller cost and the need to print receipts is considerably more than an online transaction.

According to Hoehle [1] suggested that all research related to e-banking encompasses various disciplines of marketing, e-commerce, information system, business and management. Global Internet users are increasingly spending more time online. Because of this, the banks in most countries provide their services online to keep their online customers. This helps those users to perform most of their banking transactions only by visiting the bank's website, and without being physically present in the bank.

The online banking accessibility is mostly useful in terms of ensuring that people are able to access the online content; especially for disabled individuals who may require special services. The term of disability here can be defined as the consequence of

physical impairment that results in restrictions on the ability of an individual's movement in society. A disability may be present from birth, or occur during a person's lifetime. Therefore, Internet banking systems come precisely to serve all categories of individuals, particularly in terms of overcoming the disabling physical negative effects.

This ensures that the Internet banking is a tool that enhances everyone's ability to access information, rather than a tool of exclusion. Creating accessible content should be an integral part of developing a bank's web site, and a consideration of accessibility requirements should be incorporated into all aspects of the design process. Most importantly, this will help promote a more inclusive digital world where resources can be shared and used by every individual.

Furthermore, some academics have focused on customer self-service technologies, highlighting the importance of technology used as a service enabler for the customer [2-5]. The benefits of such technologies are argued to stem from the fact that customers can access services when and where they want without some of the complications of interpersonal exchanges Bitner [3]. Internet banking system is one of such technologies, and forms the general study of this current study. The next section presents an overview of Internet banking technology.

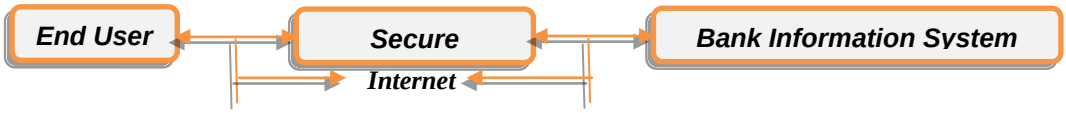
OVERVIEW OF INTERNET BANKING TECHNOLOGY

The Internet is truly a global phenomenon, making both of distance and time irrelevant to many exchanges. Internet banking system assures the exploitation of new business opportunities in the banking sector in terms of more effective performance, greater economic efficiency, and a quicker exchange among financial markets. Globalization, liberalization, technology and demographic are major trends affecting the financial market in each country Seipp [6]. This implies increasing competition among banks and other financial institutions. Additionally, the Internet and advanced information technology have brought radical changes to the banking sector. According to Ody [7], people use the Internet largely for two main reasons; to find information or buy products and service conveniently in quicker pace. He also emphasizes the importance of quality characteristics on information system acceptance. This encouraged most banks to provide a variety of online services, which allow their customers to perform most of their banking transactions by visiting the bank's website.

Internet banking system is an innovative form of advanced information systems technology designed for end- users and offers them online services that enable them to conduct their financial transactions through a computer devices or tablet devices recently. Unless the user has personal device and availability of the Internet, it is unlikely to consider using Internet banking at all [8]. Banking online system includes digital series of processes, whereby clients are able to log into the bank's website through the web-browser installed on the PC and carry out various online

transactions by using a private username and password based on the user's selection. In addition, Internet banking systems support communication with other servers, such as Internet information servers. These participate in the environment and contribute other services and information to present a variety of online services. Banks create their formal web site through the adoption of basic web technologies. Figure 1, clarifies the main functional components, their roles and contribution within the entire system, whereby the end-user can access the secure website of the bank via the Internet. Interaction between user and service provider systems is supported by multilevel dialogs. The bank account server as part of the system receives the instructions to provide the substantial functions to be performed on the bank accounts, whereby end users assume more responsibility for their own applications, and they rarely have direct interaction with the operations staff of the websites.

Figure 1: Relationship between users and banking server.



The developments in IT have had an enormous effect in the development of more flexible payment methods and more user-friendly banking services [9]. The development and diffusion of Internet banking technology are expected to result in more efficient banking systems. In addition, banking institutions can offer their products and services through such electronic channels, more conveniently and economically without reducing the quality of the existing levels of service. Advantages of Internet banking systems are numerous for both banks and customers. For banks, Internet banking brings a range of benefits from reducing costs to gain greater satisfaction for their customers. For customers, it gives them an easy access to their accounts, as they no longer have to visit banks to do their transactions personally. Service providers also benefit from Internet banking as it regarded as the best way of achieving growth. Additionally, Internet banking provides an alternative for faster delivery of banking services compared to the traditional methods.

According to the latest statistics, the number of Internet users around the world in 2016 is estimated at about 3.7 billion, an increase of over 933.8 percent between 2000 and 2016 [10]. This result affirms that Internet users are massively increasing across global countries, that makes the online banking systems represents the largest transactional sector on the web. While, Jordan is considered the heart of Middle Eastern countries which drove most Jordanian banks to adopt online banking services in order to satisfy the need of their customers as a result of concluding a Free Trade Agreement between Jordan and some foreign countries such as the U.S, whereby the total number of Internet users in Jordan is estimated to be 5,700,000 with 86.1% of the Internet penetration among the whole population of Jordan 86.1% [10]. This result quiet clarifies that telecommunication and Internet sector is one of the fastest growing industries in Jordan.

Despite of studies that explore the convenience of Internet banking technology are obtainable, research in the context of Jordanian perspective is still insufficient. Therefore, the main objective of this study is to understand the substantial factors to measure the extent of merit perception of using such a convenient technology by developing an Internet banking system model (for community in Jordan), that raises their intentions towards the use of Internet banking. To achieve the research objective, one main research question was addressed: "What factors affect the merit perception of using the Internet banking technology from the user's perception?". The next section in more details presents the importance role of emergence of research model.

Emergence of research model

The initial adoption of online services such as Internet banking, essentially involves the acceptance of both the Internet technology and online service providers. Several approaches were developed in order to examine and understand the factors affecting the acceptance of computer technology in organizations, including the theory of reasoned action (TRA) [11], the theory of planned behaviour (TPB) [12], the model of PC utilization [13], the decomposed theory of planned behaviour [14, 15], innovation diffusion theory (Rogers, 1983, 1993; Agarwal and Prasad, 1997), and the moguls model of computing [16]. Nevertheless, the technology acceptance model (TAM) is largely used by specialist researchers in the domain of information systems due to its popularity with high validity. In this context, (TAM) is applied in this current study as a theoretical background for some reasons:

- It is the most effective model in the field of information systems and technology for testing user acceptance and usage behaviour [17],
- It has a predictive power which makes it easy to apply in different situations [18],
- There is a common agreement among researchers that the model is useful in predicting individual's acceptance of various technologies [19, 20],
- It helps to understand the relationship between different explanatory variables.

Technology acceptance model (TAM) is mainly suggested for technology-based perspective through two system features of perceived usefulness (PU) and perceived ease of use (PEU). Perceived usefulness is defined as the extent to which a person believes that using particular technology would enhance her/his job performance while perceived ease of use is the degree to which using IT is free of effort for the user [21]. The model distinguishes Perceived Usefulness (PU) and Perceived Ease of Use (PEU) as key factors that influence acceptance of a certain technologies. In the present study, the researcher assigns PU in the context of Internet banking as the degree to which a user believes that using Internet banking system service would enhance banking services usability. While, PEU is determined as the degree to which a user believes that using Internet banking technology would

be free from effort.

According to Davis [21], research in technology acceptance must be addressed, how other variables affect usefulness, ease of use. Numerous studies have sought to expand the TAM by incorporating additional constructs [14]. In accordance with previous studies, the conceptual framework of the current study is developed based on a review of the literature and modified by the author to make it relevant to the Jordanian situation. As a result, an extended of the TAM model contains external variables can be used in order to explore influential factors of make Internet banking systems more convenient during the mode of usage. Thus, several hypotheses have been formed for investigating the theoretical model in Jordan.

External Variables

Convenience (CNV)

Webster's Dictionary defines convenience as "anything that adds to one's comfort or saves work; useful, handy or helpful device, article, service, etc." In the marketing context, is referred to convenience goods as those that the consumer purchases frequently and\ immediately at easily accessible stores Copeland [22]. It may also be defined as consumer perceptions regarding the relative time and effort expended in either purchasing or using a service [23]. Convenience has been one of the principal motivations underlying customer inclinations to adopt online purchasing [24-31]. In the current study, the author defines convenience in the context of Internet banking as an automated accessible online service 24 hours a day and seven days, that increases comfort for users while reducing the expenditure of time and effort on the part of using such an advanced technology.

The construct of service convenience is multidimensional in nature [23,29,32-34]. Several authors have acknowledged that service convenience impact on overall consumer assessment of the service, including satisfaction with the service as well as perceived quality [23,35]. Furthermore, Seiders et al. [34] have extensively reviewed the literature on consumer convenience in a service economy and define "service convenience" as consumers' time and effort perceptions related to buying or using a service. The time-saving aspect of convenience has been intensively investigated in consumer waiting literature, particularly with respect to consumer reaction to waiting time [36]. The concept of effort saving refers to the minimization of cognitive, physical, and emotional activities that consumers must bear to purchase goods and services [23]. For instance, the desire of customers to obtain convenience and time-saving ability to view and pay multiple bills in a single place.

In addition, the other dimension of convenience is the accessibility term, whereby the power of the web is in its accessibility by everyone**.** Accessibility term determines as the ability of users to access information and services from the website, that basically rely on the content format; the user's hardware, software and settings;

internet connections; the environmental conditions and the user's abilities and disabilities. In line with Internet banking system, the accessibility of bank website converges to the implementation of website content in a manner to maximize the ability of different categories of individuals to access it. Karahanna and Straub further suggested that examine the effect of accessibility on the perceived ease of use. Their research results indicated that perceived accessibility significantly and positively influences the construct perceived ease of use. In the end, the author in this study focuses on the dimensions of online convenience are in terms of access, search, evaluation, and transaction.
H1: Convenience (CNV) has a positive impact on customer's perceived ease of use.

Technology self-efficacy (SE)

The technology self-efficacy is an individual's belief about his/her ability to successfully use the technological service to accomplish a specific task - a confidence acquired from multiple positive experiences and acquired familiarity with the Internet channel. Self-efficacy construct has been examined in the information systems literature [37,38]. A study of Davis et al. [21] suggested that the technology self-efficacy and the construct of 'perceived ease of use' are connected.
H2: The technology self-efficacy (SE) has a positive impact on customer's perceived ease of use.

Quality of the Internet connection (QI)

The quality of the Internet connection is a major ingredient for any web-based applications. With improper Internet connection, the use of Internet banking becomes impossible. Thus, confirms that there is a significant relationship between the speed of the Internet and the use of Internet banking services.
H3: Perceived quality of the Internet connection (QI) has a positive impact on customer's perceived usefulness.

Awareness of services (AW)

Gaining awareness is basically influential in using Internet banking services and that this must be achieved correctly. According to Sathye [39] and Al-Somali et al. [40], awareness of service has direct influence on user intention to use the technology.
H4: Awareness of online services (AW) and its benefits has a positive impact on customer's perceived usefulness.

Internal variables

Perceived ease of use (PEU)

This study suggests that the Internet banking system requires less effort to use, learn, and train. An empirical study conducted by Wang et al. [41] shows that

perceived ease of use has a direct significant positive effect on behavioral intention to use Internet banking. Gefen et al. [42] further point out that perceived ease of use, trust, and perceived usefulness are considered as significant determinants of online shopping. Based on TAM, a direct positive relationship has existed between PEU and PU, and that leads to improved performance by saving effort needed to do the same work, which is proved by the increase in PEU [19,21,43]. In the light of above context, PEU has an influence on user acceptance of an Internet banking system, both directly and indirectly through its effect on the PU.

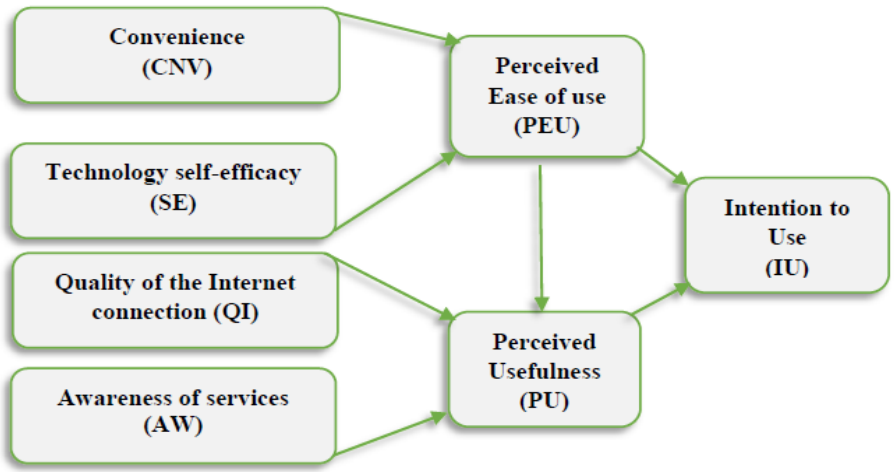
H5a: Perceived ease of use has a positive impact on the intention to use the Internet banking system.

H5b: Perceived ease of use has a positive impact on the user's perceived usefulness of the Internet banking system.

Perceived usefulness (PU)

(PU) is one of the most popular and important factors in the existing literature of online banking system [44]. This importance of PU suggests that users are generally more likely to accept a system primarily because of the functions it performs, implying that the ease of use cannot compensate for a system that does not provide the required functionality [21]. Several studies showed that perceived usefulness influence customer interactions with Internet banking [40], and these studies also suggested that perceived usefulness affects the adoption of Internet banking services.
H6: Perceived usefulness has a significant positive effect on the intention to use the Internet banking system conveniently.

Figure 2: The proposed model.



A reference to previous researches conducted with TAM in predicting new

acceptance technology, actual usage is often measured through behavioural intention (BI) [12,45]. Therefore, the researcher here is decided to go along with previous studies and considered intention to use (IU) as the dependent variable instead of actual usage, for the essential reason that in the original TAM, PU and PEU were postulated to have a direct relationship with the construct of intention to use but not with actual use. Figure 2, next exemplifies the hypothesized proposed model.

EXPERIMENT DESIGN

The questionnaire is a mechanism of data collection, which is considered very popular among researchers. A self-administered questionnaire was constructed and developed based on previous literatures to obtain the best outcomes. Interval scaling in the form of a numerical scale was selected as the most appropriate to measure all variables of the study. In this scale, numbers are assigned to indicate order and measure distance in units of equal intervals [46].

The Likert scale is accepted and treated as yielding interval data by most of researchers [47]. By using a survey method in the current study, five-point Likert scales with ranged from “strongly disagree” to “strongly agree” were used to examine participants' responses for the main factors that formed the proposed model. Furthermore, the questionnaires were handed out directly to the sample and were collected back after a specific time to ensure the validity, accuracy, and the credibility of the data.

The present study mostly uses the closed-ended questions in the survey questionnaire to keep the context of the question same for all respondents [48]. This also helps in reducing researcher’s bias. The questionnaire is divided into three main sections according to Internet banking service usage. The election of the questionnaire items was derived from previous literature and information systems studies, which is considered the main source of information in developing the research model and questionnaire.

The questionnaire begins with general (demographic) section consist of questions which collect information about gender, age, level of education, and income. In the second section, the participants are asked to provide background information on Internet usage. The third set of questions belongs to items of different constructs in the proposed model to measure the study variables. In addition, the survey questionnaire is escorted with a cover letter spelling the purpose of this study to ensure confidentiality and privacy of the data collection process, and to ensure the respondents to know with whom they are dealing [49].

For this study, which focused on the banking industry within technological frameworks, a sample of 400 participants was chosen from the Jordanian community. All participants were bank customers selected randomly from

companies, universities, and different institutions and are presupposed to have some experience in using the Internet. The expected age of adult participants is 18 years or older. In this current study, 356 questionnaires were returned out of 400 distributed, representing a response rate of 89% of the pristine sample. After screening the questionnaires, 14% of the questionnaires (50 responses) were exempted from the analysis because of incomplete answers for most sections in the questionnaire. Three hundred and six usable responses were used in the analysis, yielding a response rate of 86%.

FINDINGS AND DISCUSSION

The data model was refined through validation of the hypothesized structure model using statistical methods. Accordingly, the proposed hypotheses were tested within a survey involving 306 banking customers residing in Jordan. Collected quantitative data were basically analyzed using Statistical Package for Social Sciences (SPSS).

To meet the purposes of this study, number of statistical techniques is applied to test and interpret the results of the data analysis, including descriptive statistics, reliability test. For instance, the descriptive statistics of the respondents' demographic characteristics were analyzed and presented first in Table 1 shown below and summary of other hypothesis analysis are presented next.

Demographic characteristics analysis

The results of participants' demographic characteristics demonstrate that largest proportions (55.6%) were male, and (44.4%) were females, but eventually both genders are using the Internet banking technology at close proportions. The largest proportion (43.1%) of respondents by age group, were those in the 18-25 years old category.

However, young people constitute the dominant age category (72.2%). Additionally, the survey respondents were generally well educated with over 64.1 % holding bachelor degree and 24.5 % having postgraduate qualifications. This point out that all respondents have an education level sufficient to provide accurate answers to the questionnaire. Based on the income, the largest proportion (43.5%) of respondents, were those earning 500-1000 JD monthly.

The results also reveal that all subsamples use the Internet service. This result is not surprising, as according to the Internet penetration among the whole population of Jordan as of the end of 2014 (86.1%). In addition, the largest proportion (93.8%) of respondents has been using the Internet for 5 years or more, particularly at home with large proportions reached to (61.1%). Moreover, all the respondents in the survey answered 'yes' when asked if they are using Internet banking system (Table 1).

Table 1: Demographic characteristics of survey respondents.

Items	**Categories**	**Frequency**	**Percent**
Gender	Male	170	55.6
	Female	136	44.4
	Total	306	100
Age	18-25	132	43.1
	26-35	89	29.1
	36-45	54	17.7
	Above 45	31	10.1
	Total	306	100
Education	High school	35	11.4
	Bachelor degree	196	64.1
	Master degree	56	18.3
	Doctoral degree	19	06.2
	Total	306	100
Income	Less than 500 JD	109	35.6
	500-1000JD	133	43.5
	1000-2000 JD	53	17.3
	Above 2000JD	11	03.6
	Total	306	100
Have you used the Internet before?	Yes	306	100
	No	-	-
	Total	306	100
How many years you have been using the Internet?	<1	**-**	**-**
	1-4	19	06.2
	≥ 5	287	93.8
	Total	306	100
Where do you use the Internet from?	At home	187	61.1
	At workplace	101	33.0
	At university	18	05.9
	Total	306	100
Does your bank offer the online banking services?	Yes	306	100
	No	-	-
	Total	306	100
Are you using the online banking system?	Yes	306	100
	No	-	-
	Total	306	100

Reliability test

The reliability test of measures is assessed by examining the consistency of the respondents' answers to all items in the measure [50]. All of the measures used in the current study show an adequate reliability with Cronbach's alpha values ranging between 0.72 and 0.89, as shown in Table 2. Besides, all values were above the recommended value (>0.7), indicating strong validity and content consistency within the questions for each construct in measuring relationships within the hypothesized model. In other words, this finding demonstrates that all the factors used in the current study are well-designed under the conditions of this survey.

Table 2: Reliability test.

No.	**Constructs**	**Alpha**
1	CNV	0.77
2	SE	0.72
3	QI	0.87
4	AW	0.79
5	PEU	0.83
6	PU	0.89
7	IU	0.87

Table 3: Analysis of variables.

Hypothesizes path	**Sum of squares**	**Asymp. Std. Error**	**F Value**	**Sig**
H1: CNV→ PEU	6.825	0.013	1.584	0.001
H2: SE→PEU	9.365	0.068	4.033	0.000
H3: QI→PU	8.123	0.027	2.204	0.008
H4:AW→PU	7.989	0.070	2.452	0.012
H5a: PEU→IU	11.357	0.035	5.195	0.000
H5b: PEU→PU	10.485	0.030	4.579	0.010
H6: PU→ IU	12.697	0.007	5.579	0.000

Significance analysis of research hypotheses

To assess the statistical significance of the research model, it is compulsory to consider the ANOVA value, which is used to analyze the differences among the group of means and their associated procedures. Table 3 reports results of analysis.

According to table three all, the above hypothesizes (H1-H6) results are statistically significant at the level of significance (α ≤ 0. 05). This confirms that all the research hypothesizes are positively confirmed and are related.

Correlation analysis of variables

Pearson correlations were calculated to identify the correlations between all latent variables and how extent is related to each other. Finding of the bivariate Pearson's correlations is listed in Table 4. The correlations between multi latent constructs are reasonably positive correlated and statistically significant at p-value < 0.01. Briefly, the findings of a correlation test show a support for proposed hypotheses.

Table 4: Correlation analysis of variables.

Constructs	**QI**	**AW**	**SE**	**CNV**	**PU**	**PEU**	**IU**
QI	1	0.621**	0.551**	0.624**	0.725**	0.629**	0.653**
AW	0.621**	1	0.668**	0.565**	0.739**	0.613**	0.632**
SE	0.551**	0.668**	1	0. 739**	0.685**	0.652**	0.695**
CNV	0.624**	0.565**	0. 739**	1	0.778**	0.723**	0.712**
PU	0.725**	0.739**	0.685**	0.778**	1	0.781**	0.756**
PEU	0.629**	0.613**	0.652**	0.723**	0.781**	1	0.735**
IU	0.653**	0.632**	0.695**	0.712**	0.756**	0.735**	1
** Correlation is significant at the 0.01 level (2-tailed).							

Given that multicollinearity between latent variables might have a small but significant impact on the bias of path coefficients [51], the author checked for potential multicollinearity among independent variables. A collinearity test revealed minimal collinearity with the variance inflation factor (VIF) of all constructs ranging between 1.089 and 2.784. As a rule of thumb, it is most often recommended that the VIF value should be lower than 10. Table 5 summarizes the result of hypothesizes which shows that generally users in Jordan have well awareness of using Internet

banking services [52-55].

Table 5: Summary of testing hypotheses.

Hypothesizes path	Reliability test	Correlation test	Approved
H1: CNV→ PEU	√	√	√
H2: SE→PEU	√	√	√
H3: QI→PU	√	√	√
H4:AW→PU	√	√	√
H5a: PEU→IU	√	√	√
H5b: PEU→PU	√	√	√
H6: PU→ IU	√	√	√

CONCLUSION

With the advancement of the Internet web, and advanced technologies, online customers can gain unlimited access to online banking services they need and enjoy a wider range of choices in selecting services with highly competitive quality. Therefore, sustaining a high level of online banking convenience has increasingly become a key driving force for customers, with the aim of enhancing their loyalty to use such an advanced technology.

Using information systems in Jordanian banks seems to be vital to the success of today's banking systems. The current research study evaluates the extended and modified TAM model, and examines the main keys to measure the merit perception of using the Internet banking technology practice in Jordan, as well as influencing users' intentions to use such advanced technology. The study finds that online banking customers generally have a fully aware of such services that have been provided over the Internet in Jordan.

Obtained results of the analysis in this study approve that all mentioned factors in the proposed model have common positive impact within prompting the use of advanced technology, i.e. Internet banking system, but with different degrees of influence on the online customer's inclination. The study also illustrates that the construct of perceived usefulness is the most influential factor on the merit perception of using the Internet banking technology among the entire variables.

In a context within which banking institutions are increasingly committed to introduce a greater rationality in the evolving operation processes, and improve the service quality standards towards their customers. Banks managements should focus more in developing efficient action plans and strategies to meet the needs of their online customers, and understanding the importance play role of information systems as critical tools operate to improve banking online services as a competitive advantage and enhance their organizational efficiency; such as enable customers to function

more independently and competence to conduct numerous online transactions on their own. Eventually, the present study contributes a better overview of understanding of advanced technology use in current measurements of services quality within the banking sectors, especially Internet banking systems in developing economies analogous to Jordan.

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