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# Communications of the Association for Information Systems

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## Internet Banking and Customers' Acceptance in Jordan: The Unified Model's Perspective

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### Abstract:

Internet banking in Jordan has developed rapidly since the year 2001, as most Jordanian banks have adopted some form of Internet usage and launched websites to serve their customers. This study extends the Unified Theory of Acceptance and Use of Technology (UTAUT) by adding perceived facilitating conditions and personality dimensions, two factors that have been suggested as important determinants of technology adoption. The frame of the study was "counter bank customers" sampled in three banks from three major cities in Jordan. The results indicated partial support for the UTAUT with respect to the predictors' effect on behavioral intentions. The extended model supported the influence of performance expectancy, social influence, self-efficacy, perceived trust, and locus of control on the individual's intentions to use Internet banking. Implications for research and practice, limitations, future research, and conclusions are discussed.

**Keywords:** Unified Theory of Acceptance and Use of Technology (UTAUT), Internet banking, technology adoption, individual differences, instrument validation

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### I. INTRODUCTION

The World Wide Web (WWW) significantly altered the contemporary business landscape for both businesses and individuals. As of 2009, the number of Internet users worldwide had increased to 1.734 billion since its introduction in the early 1990s [Internet World Stats, 2010]. Furthermore, between 2000 and 2009, the annual growth rate of Internet users worldwide has been estimated to be 380.3 percent, with the Middle East experiencing a rate of 1,648.2 percent [Internet World Stats, 2010]. This growth of Internet usage has created many new opportunities for Middle Eastern firms to provide services and products, particularly within the banking industry.

Previously, customers were limited to conducting transactions at the bank's premises, at an ATM, or over the telephone, but the Internet provides banks an additional channel for serving their clients. In many countries, providing multichannel banking has become a competitive necessity [*The Banker*, 2003]. One reason for this increased importance is that financial institutions can realize significant cost savings by utilizing the Internet. A typical Internet-based banking transaction averages about \$.01 in cost, while transactions at a physical bank location or through an ATM costs \$1.07 and \$.27, respectively [Giglio, 2002]. Additionally, the use of online banking reduces the time necessary for customer transactions to occur [Karjaluo et al., 2003].

Customers also benefit from the availability of financial services via the Internet. Online banking enables customers to perform transactions and other activities from home. Most banking transactions can be conducted twenty-four hours a day, 365 days a year. However, despite the benefits, only 39 percent of potential customers conducted online banking activity for the twelve-month period ending August 2005 [Sharma, 2005] and evidence suggests that most customers who have adopted Internet banking also continue to use traditional banking methods [Sarel and Marmorstein, 2004]. Like other new technologies, online banking is faced with the challenge of customer adoption. Since the success of this service is dependent on its adoption rate, a better understanding of which factors influence customers' adoption is needed.

Unfortunately, most of the technology adoption theories and models have not been extensively tested outside of developed countries, while results have been inconsistent in instances where these models have been tested in developing countries [Bandyopadhyay and Fraccastoro, 2007; Lin and Bhattacharjee, 2008]. Several authors have suggested that this change in predictive power could be related to differences in culture within the specific countries [Akour et al., 2005; Al Sukkar and Hasan, 2005; Bandyopadhyay and Fraccastoro, 2007; Steers et al., 2008]. Bandyopadhyay and Fraccastoro [2007] utilized Hofstede's dimensions of culture to compare India (a developing country) to the U.S. (a developed country) and found that culture did impact behavioral intention through perceptions of social influence (i.e., individuals in different cultures react differently based on what significant others think). Consequently, there is a need to study these technology adoption theories and models in the context of different cultures. Therefore, the first objective of this study is to determine the validity of the Unified Theory of Acceptance and Use of Technology (UTAUT) in a developing country. This theory has not been extensively validated since it was initially proposed by Venkatesh et al. [2003]. A review of several academic databases indicated that there has been a limited number of studies that have utilized this unified theory of technology acceptance since it was proposed; only the study by Al-Gahtani et al. [2007] has tested UTAUT in a Middle Eastern country (Saudi Arabia). Their study provides two findings that are important to our study: first, the UTAUT may not be as robust in an Arabic setting; this is suggested by their finding of explained variance for behavioral intention, 39.1 percent, and explained variance for usage, 42.1 percent. Second, their study found that culture dimensions, specifically differences between Middle Eastern countries and Western countries, can impact the relationships hypothesized within the UTAUT model. These findings suggest that additional testing must be undertaken to determine the applicability and robustness of this proposed technology acceptance model.

Jordan was selected as the country of interest for this study because of its unique location in the Middle East, its significant cultural differences from Western cultures, and the country's recent commitment to developing its information technology infrastructure [Akour et al., 2005; Al Sukkar and Hasan, 2005]. Hofstede's four dimensions of culture (power distance, uncertainty avoidance, individualism, and masculinity) suggest that Arab countries differ significantly from Western cultures such as the U.S. These differences as they relate to Jordan and their impact on technology acceptance were tested by Akour et al. [2005] in the context of Internet adoption. They found that Power Distance and Collectivism both had a significant influence on intention to use the Internet, while Uncertainty Avoidance and Masculinity were not significant in this decision. Akour et al. suggest that managers in Jordan may be

passing through a transition period of cultures and that these findings may not be consistent with the general Jordanian population.

The second objective of this study was to extend/modify the UTAUT by adding two composite constructs that, we believe, influence intention to use a technology. First, individual differences can have both a direct and indirect effect on system usage [Zmud, 1979]. Furthermore, individual differences can be major predictors of system success, usage, satisfaction, and decision-making. Based on Zmud's classification of individual differences, we suggest personality as a factor that can have a direct affect on behavioral intention. The personality dimensions investigated in this study are self-efficacy, anxiety, perceived trust, perceived risk, personal innovativeness, and locus of control. Second, the UTAUT hypothesized that perceived facilitating conditions influences usage directly and not behavioral intention. In this study, we modify this relationship and hypothesize that perceived facilitating conditions directly influences behavioral intention.

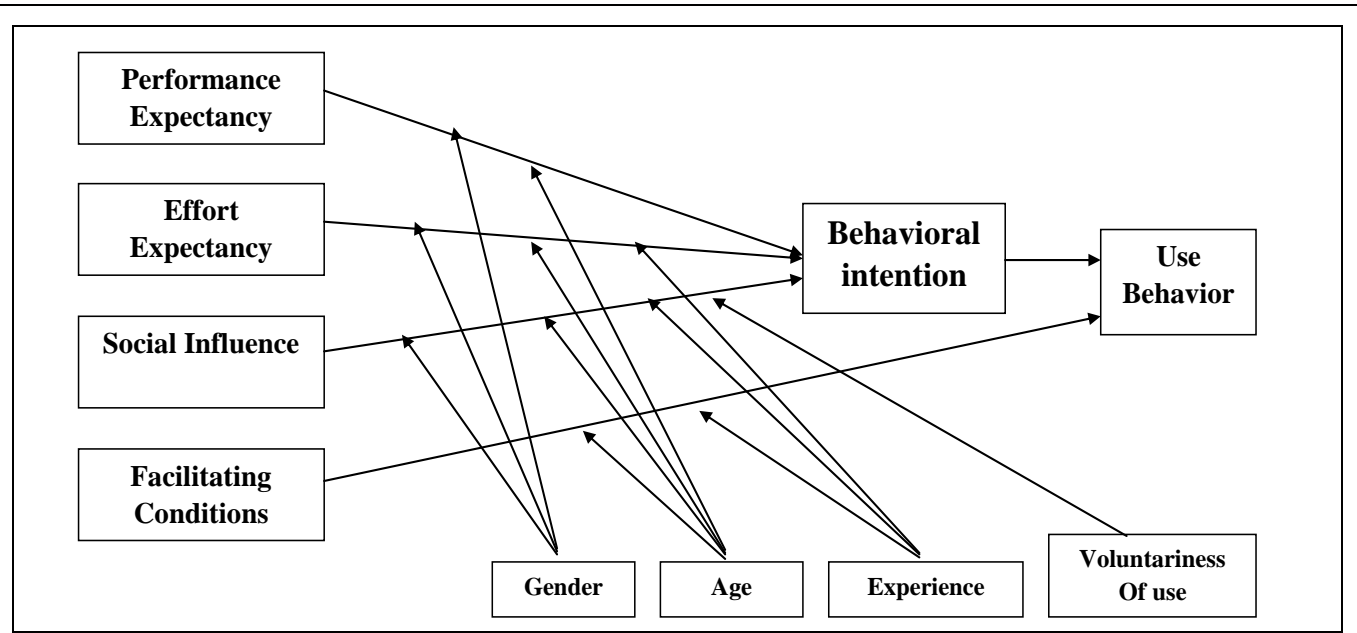
## II. LITERATURE REVIEW

In this section, we review the literature in three main areas: technology acceptance, Internet banking, and research related to these two areas as they apply to Jordan and other Arabic countries.

### Technology Acceptance

Technology acceptance has been thoroughly researched in the field of information systems. Many models and theories have been developed which attempt to predict an individual's intention to adopt a specific technology. This stream of research has explored topics such as the adoption of electronic commerce [Kartiwi and MacGregor, 2007; Pavlou, 2003; Zhuang and Franz, 2008], wireless technology [Fang et al., 2006], electronic medical record technology [Chan and Hu, 2002; Hennington and Janz, 2007], instant messaging [Li, Chau, and Lou, 2005], banking technology [Kamel and Hasan, 2003], Internet banking [Shi et al., 2008; Shih and Fang, 2006], and Internet-based search engines [Sun and Zhang, 2006], and typically has concentrated on "usage" or "intention to use" as the key dependent variable. For instance, Son, Kim, and Riggins [2006] developed a model explaining technology acceptance of Internet-based infomediaries by individuals who shop online. They empirically examined their model and found that an individual's intention to use is significantly affected by their perceptions about the efficiency and effectiveness of the infomediary. Moreover, ease of use has significant positive relationships with perceived efficiency, perceived effectiveness, and intention to use. Another example is provided by Wang and Benbasat [2005], who examined the impact of trust when integrated into the TAM model to predict intention to adopt online recommendation agents when purchasing a digital camera. Using an experimental design, the study found evidence that trust has significant positive relationships with intention to adopt and perceived usefulness. In turn, perceived usefulness was directly related to intention to adopt. The relationship between perceived ease of use and intention to adopt was found to be fully mediated by perceived usefulness and trust. For comprehensive reviews of proposed models/theories of technology acceptance, see Lee, Kozar and Larsen [2003] and Venkatesh et al. [2003].

In particular, the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. [2003], represents a shift from a fragmented view of technology acceptance to a unified view that integrated the major theories and technology acceptance models into a single theory. Specifically, UTAUT integrates eight models that relate to the information technology acceptance domain with behavioral intention and use behavior as the main dependent variables. Coming from the original expectancy theory, the models that were integrated to formulate the UTAUT were the theory of reasoned action (TRA), the technology acceptance model (TAM), the theory of planned behavior (TPB), the decomposed theory of planned behavior (DTPB), the diffusion of innovation theory (DIT), the social cognitive theory (SCT), the motivational model, the model of PC utilization, and a combined model of TAM and TPB. The UTAUT model examined the determinants of user acceptance and usage behavior (performance expectancy, effort expectancy, social influence, and facilitating conditions) and found that all contribute to usage behavior either directly or through behavior intentions. These relationships were found to be moderated by gender, age, experience, and whether or not use is voluntary (see Figure 1). In the context of this study, performance expectancy is defined as the degree to which an individual believes that using Internet banking will help him or her achieve their goals; effort expectancy is defined as the degree of ease associated with using Internet banking; social influence is defined as the degree to which an individual perceives that important others believe he or she should use Internet banking; and facilitating conditions is defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support Internet banking [Venkatesh et al, 2003].



**Figure 1: Unified Theory of Acceptance and Use of Technology [UTAUT]**

### Internet Banking

Online banking was first offered in the early 1980s as a result of banks striving to provide home banking services. This early online service required the use of the bank's proprietary software [Bidgoli, 2004]. Previously, touch-tone telephone technology was used by financial institutions to meet this customer need, but telephone service lacked the ability to provide a graphical interface and was cumbersome to utilize [Chou and Chou, 2000]. With the introduction of the World Wide Web, the demand for Internet banking services increased [Dandapani, 2004]. In fact, demand for Internet-based banking services has grown to the point where some banks, such as Netbank [Rothstein and Watson, 2004], operate exclusively online.

Since its growth in popularity in the early 2000s, Internet banking has attracted the attention of many academics and has resulted in extensive research. For example, Liao and Cheung [2008] utilized the idea of bounded rationality to propose a framework for measuring customer satisfaction with Internet banking. They found that the six constructs of the proposed framework [usefulness, ease of use, reliability, security, responsiveness, and continuous improvement] explained 78.3 percent of the variance in customer satisfaction. In the same vein, Tan and Teo [2000] developed and empirically tested a model for intention to use Internet banking services based on the theory of planned behavior and diffusion of innovations theory. They found evidence that certain dimensions of attitude, namely relative advantage, compatibility with values, Internet experience, banking needs, trialability, and risk, as well as certain dimensions of perceived behavior control, specifically self-efficacy and government support, were significantly related the intention to use Internet banking. Sciglimpaglia and Ely [2002] found a high risk of customer loss for banks offering their services on the Internet. Their study suggested that 32.9 percent of customers would consider switching banks based on the interest rate offered by other online banking service providers and, for customers who have Internet connectivity in their homes, the possibility of switching increased to 40.5 percent. The importance of meeting customer needs becomes evident in consideration of such evidence. Therefore, research such as that conducted by Chung and Paynter [2002] is useful in addressing customer satisfaction. They found that download time, response time, security, and a transaction free of technical problems were significant factors affecting customer perceptions of Internet banking websites. Moreover, customer age, education level, previous experience using touch-tone telephone technology for banking transactions, and the perceived simplicity of conducting transactions were all important factors which have an effect on customers' willingness to adopt web-based banking services. Jayawardhena [2004] also explored service quality in Internet banking and concluded that five major dimensions can be used in measuring the service quality a website offers: access, website interface, trust, attention, and credibility.

In addition to research focusing on Internet banking services in the U.S., researchers have also investigated issues in other countries. For instance, Gounaris and Koritos [2008] surveyed Greek Internet users to assess their intention to adopt Internet banking utilizing the Perceived Characteristics of the Innovation (PCI) framework. They found that this framework provided better results than the Technology Acceptance Model (TAM) and that social (image and



result demonstrability) factors, as well as psychological (trialability) factors, play a significant role in the consumer decision to adopt Internet banking. In another study that investigated Internet banking in a developing country, Reid and Levy [2008] found that the original TAM provided a better fit than an extended model which included trust and computer self-efficacy. These authors also found that gender differences significantly impacted the role of trust in the adoption decision. Lichtenstein and Williamson [2006] found that Australians preferred convenience when adopting Internet banking. Their respondents appeared less concerned about risk than respondents from many other Internet banking studies. They suggest that this could be a result of culture. Appendix 1 has been included as a review of recent empirical studies on Internet banking use/adoption intention for countries outside of the U.S.

While Islamic and developing countries share many of the same characteristics as Western countries with regards to the types of services that banks offer via the Web, the rate at which these services are provided appears to lag [Al Sukkar and Hasan, 2005]. This is in part due to Internet usage remaining somewhat limited in the Middle East. Internet World Statistics [2010] found that the Internet penetration was significantly below developed areas of the world such as North America, Oceania/Australia, and Europe (28.3 percent versus 74.2 percent, 60.4 percent, and 52.0 percent respectively). Other reasons for the slow adoption by financial institutions include lack of top management support, security, and privacy issues [Guru et al., 2003], as well as technology and marketing costs, insufficient customer demand [Budd and Budd, 2007], intra-organizational power conflict, and a general lack of investment in e-commerce applications [Khalfan and Alshawaf, 2004].

Despite these difficulties, it appears that services provided via the Internet will play an important role in the future success of banks in the Middle East. Retention of customers, which is driven by customer satisfaction, is the most essential factor for gaining and maintaining market share [Rust and Zahorik, 1993]. Evidence has supported this hypothesized relationship between satisfaction and retention for bank customers in the Middle East [Al Sukkar and Hasan, 2005]. Moreover, offering products, such as Internet services, has been demonstrated as having a direct and positive effect on satisfaction [Kassim and Souiden, 2007].

### Internet Banking in Jordan

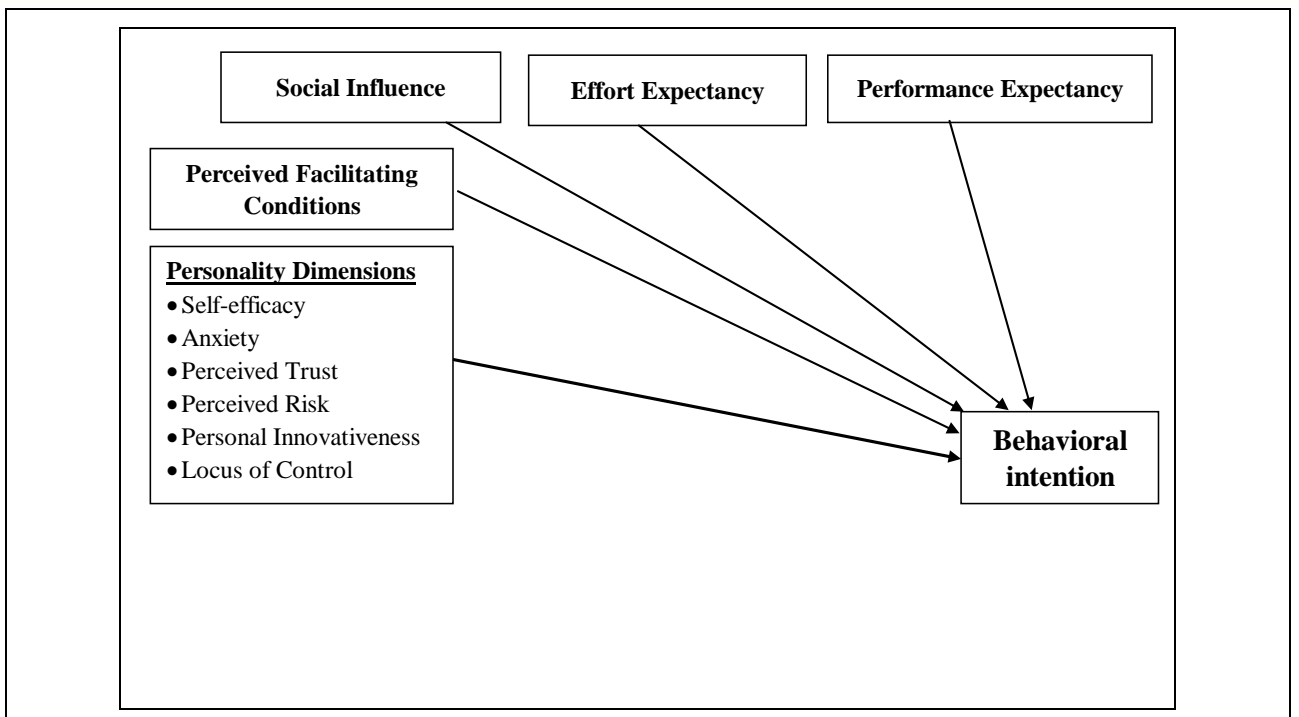
The Hashemite Kingdom of Jordan is an Arab country uniquely situated at the crossroads of three continents: Asia, Africa, and Europe. Connecting East to West, Jordan has been a key trading post in the Middle East for centuries. In the late 1990s, the Jordanian government adopted the goal of developing an intellectually competitive IT industry, one that attracts both foreign and local investments, generating high value jobs, and producing substantial levels of export. In particular, aggressive initiatives have been taken to implement Internet-based technologies to help facilitate the desired social and economic development [Ciborra and Nevarra, 2005].

Consequently, the data communications sector in Jordan has developed substantially over the last few years. Jordan was first connected to the Internet in 1996 [Eid, 2004]. As of 2008, the country's total number Internet service providers [ISP] has grown to fourteen, providing a total 260,922 ISP accounts [Domain Tools, 2008]. Additionally, the total number of Internet users has increased from 3,146 in 1996 to 1,126,700 in 2008, or about 23.3 percent of Jordan's population [Internet World Stats, 2008]. Interestingly, because access charges by ISPs are frequently high in Arab countries, despite the fact that the number of households owning a personal computer have been increasing, facilities providing public access, such as Internet cafes, are heavily relied on by Arab Internet users [Wheeler, 2004].

Jordan, like any other developing country, is witnessing a rapid movement towards Internet banking. Interestingly, it appears that academic researchers have largely neglected this transformation; a search of academic databases found only two studies that are related to Internet banking and Jordan. A 2003 study examining commercial banks in Jordan found that of the major Jordanian owned banks which operate within the country, all maintained an informational website [Awamleh, Evans and Mahate, 2003]. However, only two of these sites offered transactional functionality. A more recent study by Migdadi [2008] found that Jordanian banks now typically provide a positive Internet banking service experience to its customers. For the purposes of our study, we visited Jordanian bank websites in January 2009 and found that all were providing some level of online banking functionality.

### III. RESEARCH HYPOTHESES

The objectives of this study were accomplished through testing two sets of hypotheses. The first set utilized the hypothesized UTAUT relationships only, while perceived facilitating conditions and specific personality dimensions were added to the UTAUT model for the second set (see Figure 2).



**Figure 2. Proposed Research Extension**

Previous research suggests that the relationship between behavioral intention and performance expectancy (PE) is a strong indicator of technology acceptance. The construct of performance expectancy was developed for UTAUT through the aggregation of performance-related constructs employed in models predicting technology use. Examples include the constructs of job-fit for the Model of PC Utilization (MPCU) [Thompson et al., 1991], usefulness for the theories of Technology Acceptance Model (TAM), Technology Acceptance Model 2 (TAM2), Motivational Model (MM), and Decomposed Theory of Planned Behavior (DTPB) [Davis, 1989; Davis et al., 1989; Davis et al., 1992; Taylor and Todd, 1995a; 1995b], and relative advantage for the Innovation Diffusion Theory (IDT) [Moore and Benbasat, 1991]. In light of these previous studies and the proposed relationship suggested in UTAUT, we expect that PE will have a significant positive relationship with behavioral intention for the use of Internet banking.

**H1a: Customers with high performance expectancy will have a greater intention to adopt Internet banking.**

The relationship between effort expectancy (EE) and behavioral intention is frequently debated, because of the effect of performance expectancy on behavioral intention. The construct was aggregated in UTAUT from perceived ease of use (PEOU), complexity, and ease of use. However, research has provided contradictory outcomes, including studies utilizing the TAM model when reviewing PEOU and those utilizing TAM, IDT, and MPCU in examining complexity [Davis, 1989; Davis et al., 1989; Thompson et al., 1991; Moore and Benbasat, 1991]. We conclude there will be a positive relationship between effort expectancy and behavioral intention related to Internet banking in Jordan.

**H1b: Customers with high effort expectancy will have a greater intention to adopt Internet banking.**

Social influence was composed for UTAUT by summing constructs such as social influence, subjective norms, and image. Like EE, social influence has been researched in many contexts and results have been mixed with respect to its influence on behavior intention as it pertains to technology use. Despite these contradictory results, social influence has been recognized for its importance in affecting behavior in the field of marketing [Bourne, 1957] and is considered a critical issue of importance in the field of psychology [Forgas and Williams, 2001]. Based on the findings of Al Sukkar and Hasan [2005] and the evidence provided by Venkatesh et al. [2003] in their formulation of UTAUT, we expect that social influence will have a significant positive relationship with behavioral intention to use Internet banking.

**H1c: Customers perceiving high social influence from significant others will have a greater intention to adopt Internet banking.**

Four factors were hypothesized by UTAUT to moderate the relationships depicted in their research model (gender, age, voluntariness, and experience). Based on the nature of this study (behavioral intention to adopt Internet banking), we dropped voluntariness and experience from the set of moderators, because use of online banking services is intrinsically voluntary and our target sample was non-Internet banking customers, respectively. Thus, only two moderators were utilized in our replication of UTAUT. Based on the relationships proposed by Venkatesh et al. [2003], we expect the following effects:

**H1d: The influence of performance expectancy will be moderated by gender, such that the effect will be stronger for men; the influence of effort expectancy will be moderated by gender, such that the effect will be stronger for women; and the influence of social influence will be moderated by gender, such that the effect will be stronger for women.**

**H1e: The influence of performance expectancy will be moderated by age, such that the effect will be stronger for younger individuals; the influence of effort expectancy will be moderated by age, such that the effect will be stronger for younger individuals; and the influence of social influence will be moderated by age, such that the effect will be stronger for older individuals.**

### Proposed Extensions to UTAUT

When exploring possible facilitating conditions, Venkatesh et al. [2003] developed theory by drawing from three important constructs: perceived behavioral control (PBC), facilitating conditions, and compatibility [Ajzen, 1991; Armitage and Conner, 2001; Ajzen, 2002; Hu and Chau, 1999; Sparks et al., 1995]. We expect that perceived facilitating conditions would exert a positive influence on behavioral intention to use Internet banking in Jordan.

**H2a: Perceived facilitating conditions will have a significant positive relationship with behavioral intention to adopt Internet banking.**

Personality refers to “the cognitive and affective structures maintained by individuals to facilitate their adjustments to events, people and situations encountered in life” [Zmud, 1979, p. 967]. Several personality dimensions have been researched and found to influence behavioral intention. For instance, self-efficacy has a significant influence on usage, performance, and outcome expectations [Bandura, 1982; Compeau and Higgins, 1995b; Johnson and Marakas, 2000; AbuShanab et al., 2003]. The UTAUT dropped self-efficacy as an antecedent of intention, but retained it as an antecedent of effort expectancy. We hypothesize, based on the social cognitive theory (SCT) literature and other work [McElroy et al., 2007; Pearson and Pearson, 2008; Thatcher et al., 2008] that self-efficacy (SE) will have a positive influence on intention to use Internet banking in Jordan.

**H2b: Self-efficacy will have a significant positive relationship with behavioral intention to adopt Internet banking.**

Anxiety is another personality dimension that was explored in the UTAUT and suggested to be a predictor of effort expectancy. The term anxiety “is most often used to describe an unpleasant emotional state or condition which is characterized by subjective feelings of tension, apprehension, and worry” [Spielberger, 1972, p. 482]. Highly anxious individuals exaggerate the threat associated with a situation, which produces the feelings of anxiety [Sarason, 1972]. The anxiety then motivates an individual to avoid conditions that produce these anxious feelings [Cheek and Buss, 1982; Epstein, 1972]. Based on the SCT literature and the work of Harrison and Rainer [1992], we hypothesize that anxiety will inversely influence intention.

**H2c: Anxiety toward using the Internet will have a significant negative relationship with behavioral intention to adopt Internet banking.**

Personal innovativeness is considered to be an important dimension of individual differences which influences technology acceptance [Agarwal and Prasad, 1999; Bhatti, 2007; Kwon et al., 2007]. Personal innovativeness has been found to be a significant moderator in training literature and a significant mediator between managerial interventions and use of innovation. We expect that personal innovativeness will have a positive and direct effect on behavioral intention.

**H2d: Personal innovativeness will have a significant positive relationship with behavioral intention to adopt Internet banking.**



Trust and perceived risk are personality dimensions that are closely related in the literature. Research has shown a direct effect of trust and perceived risk on use intention [Pavlou, 2003; Warkenton et al., 2002]. Moreover, other work emphasizes the role of trust in predicting usefulness, intention, and usage [Suh and Han 2003; Gefen et al., 2003; Wang and Benbasat, 2005; Komiak and Benbasat, 2006; Reid and Levy, 2008]. We expect that the personality dimensions of trust and risk propensities will have a positive and direct effect on behavioral intention.

**H2e: Perceived trust will have a significant positive relationship with behavioral intention to adopt Internet banking.**

**H2f: Perceived risk will have a significant positive relationship with behavioral intention to adopt Internet banking.**

Locus of control (LOC) is another personality dimension which can affect technology acceptance. This paper draws a distinction between internal LOC and self-efficacy. Self-efficacy is task specific, meaning that an individual might have high SE toward one system and lower SE toward another, while internal LOC is an internal and stable individual characteristic which would affect the individual's perception of all systems accordingly [Gist, 1987]. We expect that individuals with internal locus of control will have higher intentions to adopt Internet banking than customers with external locus of control.

**H2g: Internal LOC will have a significant positive relationship with behavioral intention to adopt Internet.**

## IV. RESEARCH METHOD

### Validation and Translation Process

The instrument used for this study utilized previously validated measures adapted from the technology acceptance literature (see Appendix II). The instrument (available at [www.business.siuc.edu/mgmt/faculty/pearson/survey.pdf](http://www.business.siuc.edu/mgmt/faculty/pearson/survey.pdf)) was translated into Arabic through the process proposed by Brislin [1976]. This process involves using an individual familiar with both the original and the target language and translating the original document into the target language. This document is then translated back into the original language by a different individual and checked for inconsistencies. Any inconsistencies were resolved prior to the initial pilot test. Finally, the Arabic survey was pilot tested using Arab students residing in the U.S. to check the readability of the instrument and the logical flow of questions. The results indicated that the sequencing of the instrument was appropriate and did not include mistakes or confusing items. This translation approach is consistent with work by Al-Gahtani et al. [2007].

The survey used in this study consisted of three sections: first, a description of Internet banking and the services provided by Jordanian banks. Second, fifty-one items were used to measure the variables tested in this study. All items were tested using seven-point Likert scales. Finally, the third section included questions regarding the demographics of respondents.

### Data Collection

The population of interest was Jordanian bank customers. The institutions chosen for this study are three leading banks in the Jordanian banking sector: The Arab Bank, The Housing Bank, and The Jordan Islamic Bank. The sampling process took place at bank branch offices in the three major cities in Jordan: Russaifa, Amman, and Zarqa. An assumption of our research is that no difference exists between the customers of these three banks or the customers residing in the three cities. The purpose of using three banks and three cities is to guard/reinforce the external validity of the study.

The use of current bank customers helps to support the external validity of the research, as they are believed to be excellent proxies for the population of the study. Additionally, our study used "counter bank customers" rather than other types of customers, such as Internet customers, to control for the bias of previous usage experience. The instrument asked the respondents if they had used or were current users of Internet banking. The study employed a systematic random sampling (taken on intervals) of customers entering the banks over the course of a two-week time period. Based on the number of independent variables in the research model, the necessary sample size was estimated. The total number of independent variables was ten, including all personality dimensions. Therefore, based on the recommendations of Hair et al. [1998], the sample size should be fifteen to twenty observations per variable. Additionally, the sample size needs be greater than 100 for power calculations and to detect significant differences in  $R^2$  with a power level of 0.8 [Hair et al. 1998]. 940 cases were collected for the final sample. The minimum  $R^2$  value that can be found with this sample size to keep the power level at 0.8 is 5 percent.

The first step performed after data collection was a visual inspection to detect any incomplete surveys. Sixty-two cases were found to be missing more than two responses and were deleted. Using the mean of the items representing each variable for each case, a preliminary regression analysis was conducted. The reliability of the instrument and accuracy of the regression model were not evaluated at this point. The preliminary tests, which included Cook's D, leverage, Mahalanobis distance, standardized DFBeta, and the standardized residuals, were conducted to identify influential cases and outliers. Cases were deleted from the sample in which limits on more than one measure were exceeded. Ultimately, this inspection resulted in the removal of nine additional cases, leaving our sample at 869 cases. Finally, because our target respondents were non-Internet banking customers, we deleted 346 cases from the sample where the respondents indicated they were currently using Internet banking. This resulted in the final sample consisting of 523 cases. Table 1 provides the demographics of the sample used for model validation and shows numbers related to bank, gender, age, and education.

**Table 1: Demographics of Non-Internet Banking Customers**

Bank	# of Respondents	Percent
Jordan Islamic Bank	204	39.0
Arab Bank	148	28.3
Housing Bank	171	32.7
Gender	# of Respondents	Percent
Male	334	63.9
Female	189	36.1
Age	# of Respondents	Percent
Less than 30	301	57.6
= >30	222	42.4
Education	# of Respondents	Percent
High school and less	156	29.8
Bachelor	296	56.6
Graduate	71	13.6

## Factor Analysis

The purpose of using factor analysis was to confirm item loadings and to check the reliability and validity of the measures used. This analysis allowed for the deletion of items that did not load significantly on its intended variable. Hair et al. [1998] recommends a ratio of 1 to 10 between the items to be factored and the number of cases used, with a minimum of 1 to 5. In this study, factor analysis was conducted on fifty-one items and the ratio of items to cases was approximately 1 to 10. The method used in the analysis was a principal components analysis with a varimax rotation (Oblimin). Preliminary checks on the results indicated the overall suitability of factor analysis based on Bartlett's test of Sphericity with a  $\chi_{1275}^2 = 29783.7$ ,  $p < .001$ . The Kaiser-Meyer-Olkin measure of sampling adequacy was used to check for excessive correlations with a value equal to 0.9466 (recommended value of KMO is greater than 0.5). This suggests the existence of small correlations between variables. Finally, a substantial part of the off-diagonal correlations in the anti-image matrix were less than 0.1, while the diagonal correlations were all more than 0.5. This indicates that factor analysis was an appropriate technique for reducing the number of items used in this study.

Social influence (SI), perceived facilitating conditions (PFC), locus of control (LOC) and perceived risk (PR) included items that loaded with values less than 0.5, which is below the minimum significant level [Hair et al., 1998]. These items were deleted from further analysis (see Appendix II). Cronbach's alpha was used as a measure of the reliability of the scales. Values that range from 0.7 and above have commonly been considered acceptable in literature [Hair et al., 1998] (see Table 2).

**Table 2: Cronbach's Alpha and the Reliability of Scales**

Factor	Original # of Items	# of Items Retained	Cronbach's Alpha
Behavior Intention (BI)	3	3	0.861
Performance Expectancy (PE)	6	6	0.930
Effort Expectancy (EE)	6	6	0.890
Social Influence (SI)	5	3	0.801
Perceived Facilitating Conditions (PFC)	5	2	0.742
Self-Efficacy (SE)	6	6	0.858
Anxiety (Anx)	4	4	0.886
Perceived Trust (PT)	4	4	0.886
Personal Innovativeness (PI)	4	4	0.835
Locus of Control (LC)	5	4	0.871
Perceived Risk (PR)	3	2	0.732

Convergent and discriminant validity are two important components of any survey based research. Convergent validity implies that the individual measures of a specific construct should be related, while discriminant validity refers to the extent to which a given construct differs from other constructs. To determine if the proposed constructs within a study display convergent validity, it is necessary to examine the factor loadings of each item on the variable of interest. Falk and Miller [1992] recommend a loading level of 0.55 to assess item reliability; as can be seen in Appendix III, all the retained items had loadings greater than the suggested threshold. This suggests adequate convergent validity. To determine if adequate validity existed, we looked at the loadings for each item to ensure that no item loaded more highly on another construct than it did on the its intended measure; the individual factor loadings listed in Appendix III suggest that this condition exists thereby providing evidence of adequate discriminant validity [Ranganathan et al., 2004]. Table 3 presents the means, standard deviations, and construct inter-correlations.

**Table 3: Descriptives and Inter-correlations**

	Mean	S.D.	LOC	Anx	PE	PT	SE	SI	EE	BI	PR	PI	PFC
LOC	4.031	1.63	1.00										
Anx	4.15	1.69	-0.11*	1.00									
PE	5.50	1.38	0.11**	-0.17**	1.00								
PT	4.58	1.58	0.02**	-0.15**	0.27**	1.00							
SE	4.82	1.32	-0.26**	0.02	-0.33**	0.29**	1.00						
SI	4.20	1.64	-0.24**	0.03	-0.28**	-0.30**	0.32**	1.00					
EE	5.12	1.25	0.25**	-0.22**	0.17**	0.22**	-0.35**	-0.26**	1.00				
BI	4.22	1.72	0.31**	-0.16**	0.12**	0.29**	-0.30**	-0.33**	0.35**	1.00			
PR	4.92	1.24	-0.27**	-0.27**	0.26**	0.24**	-0.22**	-0.09**	0.33**	0.25**	1.00		
PI	4.72	1.47	0.05**	0.05	-0.28**	-0.26**	0.16**	0.21**	-0.32**	-0.32**	-0.21**	1.00	
PFC	4.86	1.76	-0.05**	-0.05	0.25**	0.19**	-0.26**	-0.31**	0.24**	0.29**	0.21**	-	1.00

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

### Replicating the UTAUT (Behavioral Intention)

The UTAUT hypothesized that three variables would be significant in predicting behavior intention: performance expectancy, effort expectancy, and social influence. Also, perceived facilitating conditions were suggested to influence user behavior directly. In this study we were not testing the relationship between facilitating conditions and use behavior, as we were looking specifically at intention to adopt Internet banking. Based on this, we dropped perceived facilitating conditions for the replication portion of our study. The resulting model included three independent variables predicting behavioral intention: performance expectancy (PE), effort expectancy (EE), and social influence (SI). This model was tested through regression analysis, which indicated significant results for all

three variables (PE, EE, and SI) with an  $R^2$  value of 0.427 (adjusted  $R^2 = 0.423$ ) and an  $F_{3,516} = 128.070$ ,  $p < 0.001$ . Table 4 provides the output of the analysis.

**Table 4: Testing the UTAUT Coefficients**

Model	UnstandCoeff. Beta	Standard Error	Standard Coefficient Beta	t	Sig.	Correlations		
						Zero-Order	Partial	Part
1 (Constant)	-0.556	0.266		-2.091	0.037			
PE	0.507	0.052	0.407	9.673	<b>0.000</b>	0.588	0.392	0.322
EE	0.153	0.056	0.114	2.725	<b>0.007</b>	0.460	0.119	0.091
SI	0.284	0.039	0.274	7.261	<b>0.000</b>	0.493	0.304	0.242

### Gender Effect

Interaction effects (or moderation effects) were estimated using an additional term(s) in the regression model that is computed through the multiplication of the independent variable(s) and the moderator. Researchers recommend using dummy coding for categorical variables in the regression model. Gender was coded with males as the reference category (control category). When testing the effect of gender as a moderator with performance expectancy, social influence, and effort expectancy as predictors, the results indicated significant results for all interaction terms at the 0.05 level. Performance expectancy and effort expectancy were significantly moderated by gender with a beta value of  $-0.449$  ( $p < 0.01$ ) and  $0.453$  ( $p < 0.01$ ), and social influence was moderated by gender with a beta value of  $0.166$  ( $p < 0.05$ ). Table 5 summarizes the results when moderated by gender.

**Table 5a: Model Summary of the Interaction Effect of Gender (UTAUT)**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1 <sup>a</sup>	0.791	0.626	0.623	1.104	0.626	209.746	4	501	0.000
2 <sup>b</sup>	0.800	0.640	0.640	0.998	0.014	6.269	3	498	0.000

a. Predictors: (Constant), Gender, PE, SI, EE  
b. Predictors: (Constant), Gender, PE, SI, EE, SI\*Gender, PE\*Gender, EE\*Gender  
c. Dependent Variable: BI

Note: Gender was coded with males as the control category (females = 1 and males = 0).

**Table 5b: ANOVA Table of the Interaction Effect of Gender (UTAUT)**

Model		Sum of Squares	df	Mean Square	F	Sig
1 <sup>a</sup>	Regression	861.921	4	215.480	209.743	0.000 <sup>a</sup>
	Residual	514.704	501	1.027		
	Total	1376.625	505			
2 <sup>b</sup>	Regression	880.650	7	125.807	126.321	0.000 <sup>b</sup>
	Residual	495.975	498	0.996		
	Total	1376.625	505			

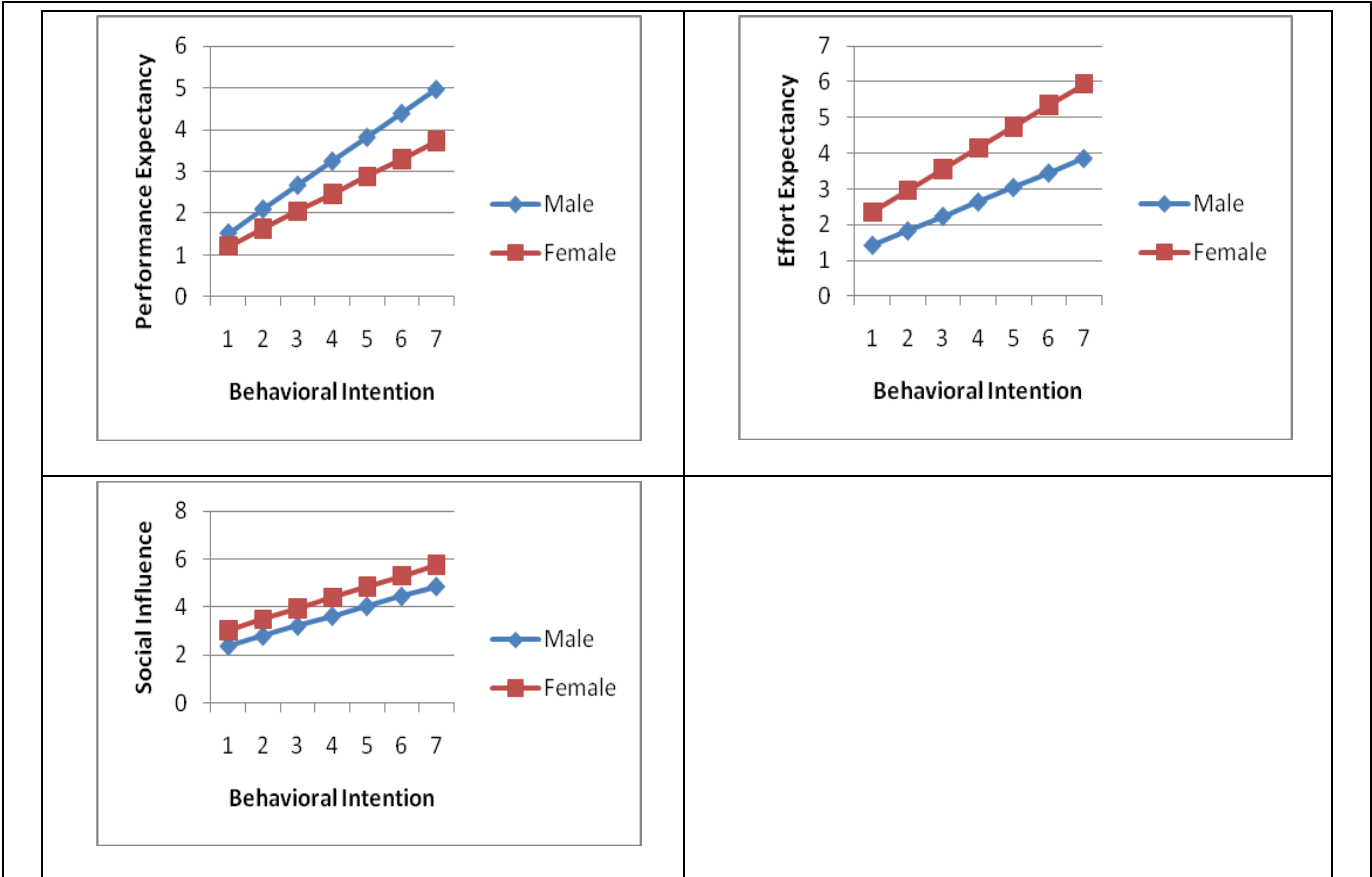
a. Predictors: (Constant), Gender, PE, SI, EE  
b. Predictors: (Constant), Gender, PE, SI, EE, SI\*Gender, PE\*Gender, EE\*Gender  
c. Dependent Variable: BI





Model		Unstand. Coeff. Beta	Std. Error	Stand. Coeff. Beta	t	Sig.
1	(Constant)	0.155	0.215		0.718	0.473
	PE	0.606	0.042	0.500	14.276	0.000
	EE	0.074	0.046	0.057	1.637	0.102
	SI	0.217	0.032	0.215	6.847	0.000
	Female	-1.346	0.094	-0.394	-14.321	0.000
2	(Constant)	0.325	0.254		1.280	0.201
	PE	0.730	0.055	0.603	13.169	0.000
	EE	-0.052	0.059	-0.040	-0.881	0.379
	SI	0.170	0.040	0.169	4.270	0.000
	Gender	-1.898	0.440	-0.555	-4.314	0.000
	PE*Gender	-0.269	0.085	-0.449	-3.170	0.002
	EE*Gender	0.297	0.091	0.453	3.254	0.001
	SI*Gender	0.127	0.064	0.166	1.982	0.048

a. Dependent Variable: BI



**Figure 3. Gender as Moderator.**

Results indicated that performance expectancy had stronger effect in the case of males, and social influence and effort expectancy had stronger effect in the case of females (see Figure 3). These results were not unexpected; as suggested by Al-Gahtani et al. [2007]. Women in Arab countries tend to be limited in social roles and professional opportunities, and it would be expected that women would be less inclined to use computers in general and may perceive adopting a computer-based application such as Internet banking to be more difficult than would Jordanian

males. Our results tend to support these premises in that Jordanian males believe that Internet banking helps them achieve more of their goals (PE) than do Jordanian women; Jordanian women believe that more effort is required (EE) to use Internet banking; and Jordanian women are more strongly influenced by significant others in their decision to adopt Internet banking. These results are also consistent with the culture scores suggested for Arab countries by Hofstede and Hofstede [2004] in that higher power distance scores would suggest that individuals will consider the opinion of significant others more than individuals from countries (e.g., U.S.A.) with lower power distance scores, and lower masculinity scores in the Arab countries would suggest that individuals with more “masculine” tendencies would probably be more likely to embrace or use new technologies to achieve their personal and professional goals.

### Age Effect

The case of age is similar to gender as there are two categories which required one dummy variable. The independent variables were multiplied by the dummy variable, which resulted in three interaction terms in the regression model. Results indicated significant interaction terms for both performance expectancy and effort expectancy when moderated by age. The beta values were  $-0.628$  ( $p < 0.01$ ) and  $0.643$  ( $p < 0.01$ ) for performance expectancy and effort expectancy respectively ( $p < 0.05$  for both). Social influence was not moderated by age. Table 6 summarizes the results of the interaction model using age as a moderator.

**Table 6a: Model Summary of the Interaction Effect of Age (UTAUT)**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1 <sup>a</sup>	0.712	0.507	0.504	1.219	0.507	129.552	4	503	0.000
2 <sup>b</sup>	0.720	0.519	0.512	1.208	0.519	77.095	7	500	0.000

a. Predictors: (Constant), Age, EE, PE, SI  
 b. Predictors: (Constant), Age, EE, PE, SI, Age\*SI, Age\*PE, Age\*EE  
 c. Dependent Variable: BI

Note: Age was coded with = >30 as the control category (<30 = 1 and => 30 = 0).

**Table 6b: ANOVA Table of the Interaction Effect of Age (UTAUT)**

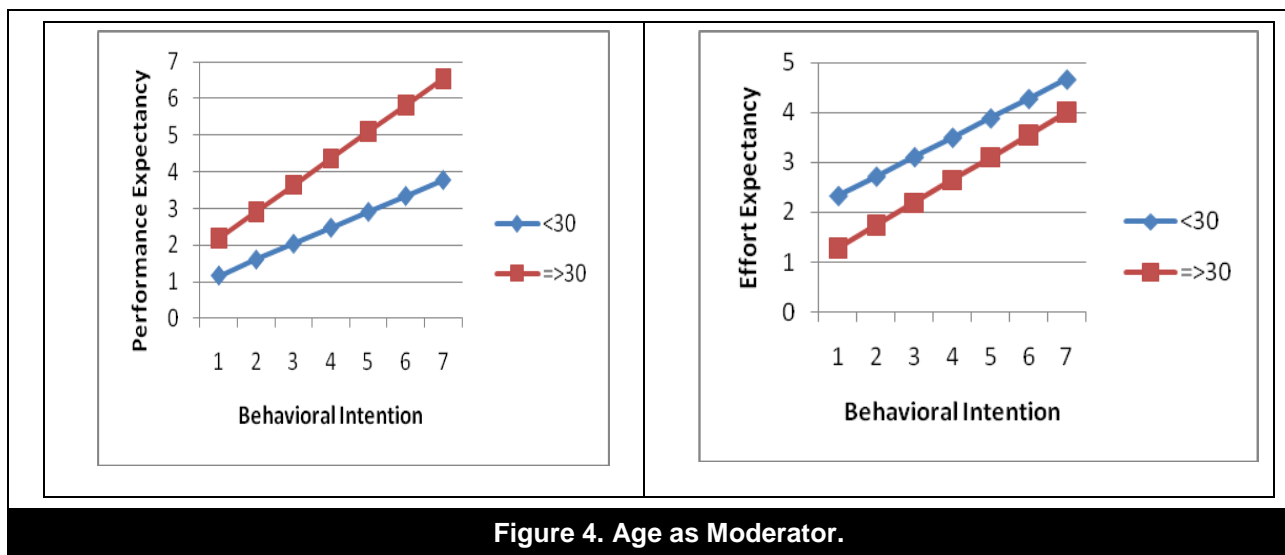
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	770.214	4	192.554	129.552	0.000 <sup>a</sup>
	Residual	747.611	503	1.486		
	Total	1517.825	507			
2	Regression	787.864	7	112.552	77.095	0.000 <sup>b</sup>
	Residual	729.961	500	1.460		
	Total	1517.825	507			

a. Predictors: (Constant), Age, EE, PE, SI  
 b. Predictors: (Constant), Age, EE, PE, SI, Age\*SI, Age\*PE, Age\*EE  
 c. Dependent Variable: BI

The results indicated that the effect was stronger for older customers (age = >30) in the case of performance expectancy, and stronger for younger customers (age < 30) in the case of effort expectancy (see Figure 4). These findings provide only limited support for H1e and contradicts the findings of Venkatesh et al. [2003]. While both studies found that age does moderate the relationships between performance expectancy and behavioral intention and social influence and behavior intention, our findings suggest different age groups are impacted. Another contradiction between Venkatesh et al. and our study is the lack of significance of age on social influence. These findings suggest that additional research should be undertaken to better understand the impact of age in technology adoption.

Table 6c: Coefficient Table of the Interaction Effect of Age (UTAUT)						
Model		Unstand. Coeff. Beta	Std. Error	Stand. Coeff. Beta	t	Sig.
1	(Constant)	-1.746	0.284		-6.143	0.000
	PE	0.417	0.049	0.333	8.492	0.000
	EE	0.160	0.054	0.115	2.931	0.004
	SI	0.149	0.038	0.143	3.928	0.000
	Age	1.572	0.113	0.448	13.917	0.000
2	(Constant)	-1.929	0.769		-2.508	0.012
	PE	0.006	0.146	0.004	0.038	0.969
	EE	0.613	0.162	0.442	3.776	0.000
	SI	0.180	0.114	0.172	1.577	0.115
	Age	1.704	0.519	0.486	3.286	0.001
	Age*PE	-0.307	0.103	-0.628	-2.998	0.003
	Age*EE	0.339	0.115	0.643	2.958	0.003
	Age*SI	-0.020	0.079	-0.043	-0.261	0.795

a. Dependent Variable: BI



### Exploring the Proposed Extensions

Our study extended the UTAUT by proposing that two additional composite variables would be significant in predicting behavioral intention. The first variable consisted of six separate constructs (self-efficacy, anxiety, personal innovativeness, perceived trust, perceived risk and locus of control) labeled “personality dimensions.” The second variable was perceived facilitating conditions, which had previously been hypothesized to influence use behavior directly in the UTAUT and, therefore, not affecting behavioral intention. The method used to explore this equation was linear multiple regression using blocks as an entering method. We entered the original UTAUT variables (PE, EE, and SI) in the first block, and perceived facilitating conditions (PFC) and the personality dimensions (SE, Anx, PT, PI, LOC, PR) in the second block. This method yields the same results when entering all variables at the same time, but also provides a test for the contribution of the different personality dimensions and perceived facilitating conditions. The equation for this proposed model is:

$$BI = \beta_0 + \beta_{PE} \cdot BI(PE) + \beta_{EE} \cdot BI(EE) + \beta_{SI} \cdot BI(SI) + \beta_{PFC} \cdot BI(PFC) + \beta_{SE} \cdot BI(SE) + \beta_{Anx} \cdot BI(Anx) + \beta_{PI} \cdot BI(PI) + \beta_{PT} \cdot BI(PT) + \beta_{PR} \cdot BI(PR) + \beta_{LOC} \cdot BI(LOC)$$

The results of the proposed model included the following significant terms (using an alpha level of 0.05):

$$BI = -0.790 + 0.469 PE + 0.176 SI + 0.132 SE + 0.216 PT + 0.138 LOC$$

**Table 7: Coefficients Table for Block Regression Analysis**

First Block		Unstand. Coeff. Beta	Std. Error	Stand Coeff. Beta	t	Sig.	Correlations		
							Zero-Order	Partial	Partial
Model 1	(Constant)	-0.408	0.272		-1.499	0.134			
	PE	0.514	0.054	0.410	9.579	<b>0.000</b>	0.575	0.388	0.325
	EE	0.131	0.057	0.097	2.272	<b>0.024</b>	0.440	0.099	0.077
	SI	0.270	0.040	0.260	6.737	<b>0.000</b>	0.473	0.284	0.229
Second Block									
Model 2	(Constant)	-0.790	0.346		-2.283	0.023			
	PE	0.469	0.052	0.373	9.060	<b>0.000</b>	0.575	0.372	0.289
	EE	-0.070	0.060	-0.052	-1.163	0.245	0.440	-0.051	-0.037
	SI	0.176	0.041	0.170	4.271	<b>0.000</b>	0.473	0.185	0.136
	PFC	-0.063	0.043	-0.060	-1.461	0.144	0.347	-0.064	-0.047
	SE	0.132	0.056	0.103	2.346	<b>0.019</b>	0.420	0.103	0.075
	Anx	-0.056	0.034	-0.055	-1.646	0.100	-0.149	-0.073	-0.052
	PT	0.216	0.045	0.197	4.802	<b>0.000</b>	0.493	0.208	0.153
	PI	0.033	0.056	0.028	0.586	0.558	0.454	0.026	0.019
	LOC	0.138	0.046	0.132	3.004	<b>0.003</b>	0.418	0.132	0.096
	PR	0.043	0.049	0.034	0.892	0.373	0.349	0.039	0.028

The  $R^2$  value was 0.480 (adjusted  $R^2 = 0.469$ ), with an  $F_{10,512} = 47.190$ ,  $p < 0.001$ . The contribution of the personality dimension was explored using the results from Table 8. The significance of the F test of the second block is considered an indication of the significant contribution of those dimensions. The results show that the change in  $R^2$  is 0.077 and that this change is significant ( $F_{10,512} = 12.65$ ,  $p < 0.001$ ). The betas of the three additional variables (SE, PT and LOC) also indicate the importance of those dimensions. Table 9 shows the ANOVA table of regression analysis.

**Table 8: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.634 <sup>a</sup>	0.403	0.398	1.322	0.403	87.239	4	518	.000
2	0.693 <sup>b</sup>	0.480	0.469	1.241	0.077	12.646	6	512	.000

a. Predictors: (Constant), PE, SI, EE  
b. Predictors: (Constant), PE, PFC, SI, EE, PT, LOC

**Table 9: ANOVA Table of the Interaction Effect of Age (UTAUT)**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	609.937	4	152.484	87.239	.000 <sup>a</sup>
	Residual	905.408	518	1.748		
	Total	1515.345	522			
2	Regression	726.795	10	72.679	47.190	.000 <sup>b</sup>
	Residual	788.550	512	1.540		
	Total	1515.345	522			

a. Predictors: (Constant), PE, SI, EE  
b. Predictors: (Constant), PE, PFC, SI, EE, PT, LOC



Customers in Jordan with high performance expectancy were found to have a greater intention to adopt Internet banking ( $\beta = 0.469$ ,  $t = 9.060$ ,  $p < 0.001$ ). The betas are particularly important in predicting behavioral intention as they compare the variables' directions. Performance expectancy uniquely explained 8.4 percent of the variance in behavioral intention (the squared value of the part correlation: 0.289). Notably, performance expectancy accounted for the largest unique contribution in explaining the variance in behavioral intention. Such results support the work of Venkatesh et al. [2003] in the UTAUT, Davis [1989] in TAM, Venkatesh and Davis [2000] in TAM2, and other replications of those models [Szajna, 1996; Toe et al., 2003].

Social influence also significantly explained behavioral intention when controlling for other variables ( $\beta = 0.176$ ,  $t = 4.271$ ,  $p < 0.001$ ). Bank customers in Jordan with high social influence had greater intentions to use Internet banking. Social influence uniquely explains 1.9 percent of the variance in behavioral intention. These results indicate support of the UTAUT findings and other research [Venkatesh and Davis 2000; Riemenschneider et al., 2002].

Additionally, self-efficacy was found to be a significant predictor of behavioral intention. This result provides more insight into the relationship between self-efficacy and behavioral intention which was not supported by the UTAUT. Customers with high self-efficacy reported higher intentions to adopt Internet banking in Jordan ( $\beta = 0.132$ ,  $t = 2.346$ ,  $p < 0.05$ ). Self-efficacy uniquely explains 0.6 percent of the variance in behavioral intention. Our findings support previous research in the social cognitive area [Compeau and Higgins, 1995b; De Vries et al., 1988].

Perceived trust was another dimension which demonstrated significant explanation of the variance in behavioral intention. The results indicate that Jordanians with high levels of trust will have greater intentions to adopt Internet banking ( $\beta = 0.216$ ,  $t = 4.802$ ,  $p < 0.001$ ). Perceived trust uniquely explains 2.3 percent of the variance in behavioral intention. This is in agreement with the work of Hoffman et al. [1999] where they concluded that the lack of trust would prevent customers from engaging in online activities. This construct was not proposed by the UTAUT, but was utilized in the work of Pavlou [2003] and Suh and Han [2003].

Locus of control was the last variable to remain in the model with a significant explanation of behavioral intention ( $\beta = 0.138$ ,  $t = 3.004$ ,  $p < 0.01$ ). Jordanian bank customers with internal locus of control have greater intentions to adopt Internet banking based on their modeling process that makes them respond faster to new systems where they believe they have control of their environment [Gist, 1987]. Locus of control uniquely explains 0.9 percent of the variance in behavioral intention. This construct has not typically been utilized in the technology acceptance domain as only two studies were reported by Zmud [1979] that have examined locus of control. Nonetheless, our findings support the hypothesis that individuals with an internal locus of control would have higher usage/utilization of the system.

The relationship between effort expectancy and behavioral intentions was supported when replicating the UTAUT. However, effort expectancy failed within our proposed extension, which supports previous findings [Locus and Spittler, 1999]. The reason might be the strong influence of competing variables (SE, PT, and LOC) or the items measuring other variables which might be measuring the same dimensions of effort expectancy (LOC or SE). Previous research supported this relationship based on the association between the ease of the system and the higher intentions to use it [Davis 1989; Venkatesh 2000; Szajna 1996]. This indicates the mediation effect of performance expectancy and the strong association between the two variables.

Also, the results indicated that the influence of perceived facilitating conditions was not significant in predicting behavioral intention. This means that Jordanian's intentions to adopt Internet banking is not influenced by what the bank provided to support the customer's usage of the system and their perceptions of the ease in using Internet banking. This could possibly be explained by potential adopters not being familiar with the services or websites that Jordanian banks provide in support of Internet banking.

The personality dimensions of anxiety, personal innovativeness, and perceived risk failed to explain a significant amount of variation of behavior intention over and above the existence of the previous relationships. This is in congruence with Venkatesh et al.'s [2003] study, which found similar results. However, other research in the technology acceptance domain has yielded contradictory results for these relationships, depending on the set of variables utilized and the structures of the models. It is worth noting that technology acceptance is a task specific area, so results will depend on the technology under consideration and subjects used.

A possible explanation for these findings is the differences in culture that exist between Jordan and the country where UTAUT was developed [Straub and Brenner, 1997; Srite, 2006; Lippert and Volkmar, 2007]. As we have suggested earlier, Jordan culture differs significantly from Western countries such as the U.S. [Hofstede and Hofstede, 2004] and this could significantly impact how potential adopters of Internet banking look or think about technology adoption.

## V. DISCUSSION OF RESULTS

The first objective of this study was to replicate the behavioral intention portion of UTAUT and examine the model's applicability to a country outside of the U.S. This study partially supported the work of Venkatesh et al. [2003]. We found evidence that three constructs (performance expectancy, effort expectancy, and social influence) are significant as predictors of behavioral intention (supporting H1a, H1b, and H1c). However, while our results were consistent with UTAUT on gender (supporting H1d), we found conflicting results on the effect age has on the three direct effect constructs (partial support for H1e). The contradiction between UTAUT and our study relating to the moderation effect of age is interesting; UTAUT suggested that performance expectancy would be stronger for men and younger workers, while we found that this relationship was stronger not only for men, but for older (= >30 years of age) individuals. We believe this difference could be based on the specific context of our study, i.e., Internet banking. Older individuals typically are more involved in work, family, and other commitments, thus valuing mechanisms that would help make their life easier and/or more productive. If this conjecture is true, it suggests that future studies are necessary to see if UTAUT is context specific.

Our study also contradicts the results suggested by UTAUT related to the moderation effect of age and its impact on effort expectancy and behavioral intention. We found that this relationship was stronger for younger individuals [<30 years of age], opposite of what was proposed by Venkatesh et al. [2003] in the UTAUT model. One possible explanation for this finding is the availability or lack of availability of personal computers and/or Internet access; Jordan is a developing country that has recently committed to developing its information technology infrastructure and the computer literacy of its general population. Many of the programs established to achieve these goals have been implemented through schools and universities in the last decade. This would create somewhat of a literacy gap between younger and older Jordanians; younger individuals would be comfortable/knowledgeable in their utilization of computer technologies and the Internet.

The second objective was to extend the UTAUT by including two additional factors that literature has suggested can influence behavior intention to adopt a technology (perceived facilitating conditions and personality). In this study, we suggested that perceived facilitating conditions would be a significant predictor of behavioral intention (H2a). The results indicated that this relationship was not significant, which is similar to the findings of Venkatesh et al. [2003]. We believe, however, that the possible explanations for the findings in this study may be related to Jordan being a developing country. Based on this, one possible explanation could be the relatively recent integration of computer technology into the Jordanian society; it is quite likely that many individuals in Jordan (or other developing countries) may not have the necessary training/skill set to effectively use personal computers or Internet-based applications. It would be interesting to see how this relationship (perceived facilitating conditions impact on behavioral intention) evolves as the information technology infrastructure of Jordan develops. This relationship could also change as the general population of Jordan becomes more computer savvy. The implication for future studies would be the need to take into consideration the relative maturity of the information technology infrastructure and general computer literacy of the country in which the study is being conducted.

Three personality dimensions were found to be significant predictors of behavioral intention; these were self-efficacy (0.6 percent), perceived trust (2.3 percent), and locus of control (0.9 percent). Of these, only self-efficacy was tested by Venkatesh et al. [2003] and was dropped from the UTAUT as a non-significant predictor of behavioral intention. A couple of possible explanations come to mind on why our study found self-efficacy to be significant. First, self-efficacy focuses on an individual's belief that he or she can perform a specific task; our study focused on a specific technology (Internet banking), while UTAUT was developed utilizing different applications within multiple organizations. By focusing on an individual's responses to a specific application or technology, it is likely that they will have stronger beliefs about their ability or inability to perform the required activities. These findings suggest that self-efficacy is an appropriate addition to UTAUT if the study focuses on a specific application or technology. Second, as mentioned previously, Jordan has only in the last decade committed significant resources to increasing the computer literacy of its general population, and most of these efforts have been through schools or universities. Since almost 60 percent of our respondents were under thirty years of age, it is likely that our respondents were more educated and more familiar with computers and Internet-based applications than the general population of Jordan (over 70 percent had a bachelor degree or above). We believe these individuals would have stronger feelings about their abilities to undertake new applications like Internet banking.

We were not surprised to find that perceived trust was a significant predictor of behavioral intention in the context of Internet banking. This finding supports the previous work done by Pavlou [2003], Warkenton et al. [2002], and others [Komiak and Benbasat, 2006; Reid and Ley, 2008]. We believe that perceived trust becomes important when the application under investigation involves a potential risk to the customer. In this case, Internet banking transactions, if not handled properly, could cause the potential customer to lose or not have access to needed funds. Similar to an argument made earlier about the impact of self-efficacy, this would suggest that UTAUT may be context specific as it relates to the application being investigated. It is possible that these findings may be unique to developing countries,

but we suspect that our findings on self-efficacy and perceived trust are more the result of our study focusing on a specific type of technology and specific Internet-based application (Internet banking).

This study did not support the addition of the personality constructs anxiety, personal innovativeness, and perceived risk. We were somewhat surprised when the constructs anxiety and perceived risk were found to be non-significant; based on our earlier suggestions that individuals would require higher levels of trust before they would adopt Internet banking, it would seem intuitive that those same individuals would experience greater levels of anxiety and perceived risk. One possible explanation would be that the respondents (non-users) were not familiar with the mechanisms of Internet banking and were, therefore, unfamiliar with the potential risks associated with this application. If they are not familiar with the risks, it is likely they would not feel a significant amount of anxiety. What this suggests is that additional work should be done on these constructs with the idea of investigating whether these two personality constructs would behave differently in the context of continued use versus adoption of a specific technology or application.

We were also surprised that personal innovativeness was not significant. It would seem that individuals that would consider adopting Internet banking would consider themselves to be innovative, especially in a developing country where a large percentage of the population does not have the skills or technology to utilize the application. After some thought, we realized we were investigating individuals who may be laggards in the adoption process. We had eliminated 346 individuals who were already utilizing Internet banking; this suggests that these individuals may be more innovative than the individuals studied in this research. This would again suggest that there is a difference between individuals who are considering a technology (potential adopters) and those who are already utilizing a technology (continued use). If this is true, and we believe it to be the case, then it would not be appropriate to utilize adoption models such as UTAUT or TAM when investigating what influences an individual's decision to continue to use a technology. Table 10 summarizes the findings and the related hypotheses tested.

### Contributions of the Study

The major contribution of the study is an addition to and extension of the body of technology acceptance knowledge. A re-examination of the UTAUT found partial support for the model. Interestingly, the results for the predictability in this study exceeded those of the UTAUT (48 percent vs. 29 percent for the UTAUT), providing evidence of UTAUT usefulness in countries outside of the U.S. Additionally, this study introduced locus of control as a significant predictor of behavioral intention, which has not been commonly utilized in the technology acceptance literature. Specifically, three important personality dimensions were significant in predicting behavioral intention over and above other variables in the proposed model: self-efficacy, perceived trust and locus of control. These dimensions added significantly to the model with a change in explained variance of 8 percent. Lastly, this study contributes to the area of technology acceptance by developing and validating an Arabic instrument for predicting the behavioral intention in the context of Internet banking through the utilization of a sample of Jordanian bank customers.

### Implications of the Study

While technology acceptance models have been shown to often have lower predictive power in cultures outside the US, the evidence from this study suggests that this is not the case for Middle Eastern countries. For researchers this implies that there is a high degree of applicability for technology acceptance theories and models which have been developed in Western cultures in research for Arab countries, such as Jordan. For practitioners, this implies that much of the progress that has been made in Western countries using acceptance models to determine attributes and functionalities of websites that attract and retain customers is also applicable in Arab countries. For both practitioners and researchers, this means there is a wealth of research available which can be drawn from to expedite the understanding of technology acceptance in the Middle East. Given the recent increase of IT adoption in Arab countries, this implication is of importance. However, caution of attributing too much weight to the conclusions of this research should be noted, as it is only a single study and additional research must be conducted to extend the generalizability of our results.



**Table 10: Summary of Hypotheses**

<b>UTAUT Replication</b>				
<b>Predictor</b>	<b>UTAUT</b>	<b>Hyp. #</b>	<b>Result</b>	<b>Explanation</b>
Performance expectancy	Positive	<i>H1a</i>	Supported	As predicted by UTAUT, we found a significant positive relationship between PE and BI
Effort expectancy	Positive	<i>H1b</i>	Supported	As predicted by UTAUT, we found a significant positive relationship between EE and BI
Social Influence	Positive	<i>H1c</i>	Supported	As predicted by UTAUT, we found a significant positive relationship between SI and BI
Moderation—Gender	Yes	<i>H1d</i>	Supported	As predicted by UTAUT, we found that the relationships among PE, EE, SI, and BI were moderated by gender
Moderation—Age	Yes	<i>H1e</i>	Partial Support	As predicted by UTAUT, we found that the relationships among PE, EE, and BI were moderated by Age; however, the relationship between SI and BI was not moderated by age. There were differences in direction of moderation also.
<b>Proposed Extension to UTAUT</b>				
Perceived facilitating conditions	N.S.	<i>H2a</i>	Not Supported	Findings are consistent with UTAUT in that our results did not find significance between PFC and BI.
Self-efficacy	N.S.	<i>H2b</i>	Supported	UTAUT indicated that self-efficacy was not a significant predictor of BI; we found that it was a significant predictor of this relationship.
Anxiety	N.S.	<i>H2c</i>	Not supported	Findings are consistent with UTAUT in that our results did not find significance between Anxiety and BI.
Personal innovativeness	–	<i>H2d</i>	Not supported	Not tested by UTAUT.
Perceived trust	–	<i>H2e</i>	Supported	Not tested by UTAUT.
Perceived risk	–	<i>H2f</i>	Not supported	Not tested by UTAUT.
Locus of control	–	<i>H2g</i>	Supported	Not tested by UTAUT.

N.S. indicates that results were not significant.



By exploring factors that affect customers' acceptance of Internet banking, the results of our study should help practitioners in the Middle Eastern banking industry focus their attention on fewer dimensions that potentially influence users' intentions to use a system. In our study, the factor which most influenced bank customers was their perceptions about the benefits derived from using Internet banking. This suggests that emphasizing the advantages of such systems and how they can improve an individual's productivity might be the most effective message to convey to customers to increase adoption. Moreover, as a highly social society, Jordanians are influenced by others in their daily lives. Our study demonstrated that the influence of others is a significant factor in determining the intention to use Internet banking, and thus banks' efforts to advertise the benefits of their online services can be amplified through the social influence on people. Providing incentives and promotions for customers' referrals can be a strong technique to influence customers to use Internet banking.

Another factor that is important to practitioners is the trust level invested in Internet banking by customers. Internet banking is a service that requires people using it to trust the system when transacting because of the associated financial risks. Banks need to emphasize the security levels implemented and the safe environment to influence customers' levels of trusts so that customers use the system. Jordanians are willing to trust banks with their financial transactions and will continue to do that when a bank builds this trustworthy business image.

Finally, while the personality trait of locus of control might be out of reach of banks' influence, banks can still affect customers' self-efficacy, which is a system specific construct, by improving their systems and providing training and guidance before usage.

### Limitations of the Study

There are several limitations to the current study that are worth noting. First, as previously stated, behavioral intention is the closest construct that can be used as a surrogate for Internet banking usage. Using behavioral intention is rich, but does not replace exploring actual usage of a system. A second limitation of this study are the variables that resulted in only two items; it is generally recommended that three or more items be used to adequately measure a construct. Another limitation of this study is the competition between a set of strong variables in predicting behavioral intention, thus a different conceptual base might explain the variance with fewer variables. Also, this study generalizes only to bank customers in Jordan, Internet banking systems, and for those who speak the Arabic language. Finally, as is a concern for most studies that utilize surveys for data collection, common method bias may be present in this research. The large amount of variance explained by the first construct extracted in the factor solution (13.67 percent) indicates this is a potential issue.

### Future Research

The differences between the results of this study and previous research conducted in North America call for research on cultural differences' effect in the technology acceptance domain. The advantage of using the UTAUT perspective is the integrated view of the major models in the area that emphasized the strength of certain constructs compared to others. The results of this study extended the current body of knowledge by providing an extended set of variables which explained a substantial portion of variance in behavioral intention. However, our understanding of the relationships and interactions of these variables still needs further exploration. Based on the significant results (related to sample size, Arabic instrument, and Jordanian customers) of this study, we are still in need of more research in the technology acceptance domain. Furthermore, longitudinal research is richer in exploring certain effects like experience. Such issues call for more longitudinal research and cross disciplinary research to explore different constructs to accommodate different situations and technologies. Usage also is a costly construct that needs resources and time to explore; this calls for more research on actual usage. Lastly, the process of translating and validating an instrument is a long and often complex process, which suggests that future research should investigate the Arabic instrument and validate it in further implementation.

Our results also call attention to specific constructs which need additional investigation. For instance, more emphasis should be placed on the performance of Internet banking systems as it is a main indicator in influencing customers' intentions to use it. Performance expectancy was integrated from five constructs used in five different models in the area, which supports the strong influence of this construct and its inclusion in future research. Another area for additional research is perceived facilitating conditions. The PFC construct had items that loaded on more than one variable, which indicates a weakness in the original structure of the instrument which warrants investigation. Also, locus of control is a variable which has been largely ignored by the literature, yet in this study was found to have significant influence on individual acceptance.

## Conclusions

This study developed and validated an Arabic instrument to be used for measuring the major factors affecting bank customers in their intentions to adopt Internet banking. Additionally, we replicated the results of Venkatesh et al.'s [2003] work on the UTAUT and were able to achieve greater predictive results than the original study. Lastly, five major factors affecting Jordanians' intentions to use Internet banking were identified as significant: performance expectancy, social influence, self-efficacy, perceived trust, and locus of control.

## REFERENCES

*Editor's Note:* The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the paper on the Web, can gain direct access to these linked references. Readers are warned, however, that:

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## APPENDIX I

Author(s) / Year	Country	Significant Constructs	Non-Significant Constructs
Grabner-Krauter and Faullant (2008)	Austria	Internet trust, perceived risk, propensity to trust, familiarity with Internet	
Jahangir and Begum (2008)	Bangladesh	Perceived usefulness, perceived ease of use, security and privacy, customer attitude	
El-Kasheir, Ashour, and Yacout (2009)	Egypt	perceived ease of use	perceived usefulness, perceived risk, social norms
Eriksson, Kerem, and Nilsson (2008)	Estonia	relative advantage, lack of complexity, perceived risk, compatibility	
Gounaris and Koritos (2008)	Greece	relative advantage, ease of use, image, voluntariness, gender, age, education, occupation, innovativeness, shopping orientation	
Cheng, Lam, and Yeung (2006)	Hong Kong	perceived usefulness, perceived ease of use, perceived web security, attitude	
Amin (2007)	Malaysia	Perceived credibility, social norms	perceived usefulness, perceived ease of use, amount of information, perceived enjoyment
Ndubisi and Sinti (2006)	Malaysia	importance of Internet to banking needs, compatibility, trialability, complexity, site utilitarian orientation	risk, site hedonsitic orientation
Poon (2008)	Malaysia	convenience, accessibility, feature availability, bank management and image, fees and charges, privacy, security, content, speed	design





Guriting and Ndubisi (2006)	Malaysia Borneo	perceived usefulness, perceived ease of use, computer self-efficacy, prior computing experience	
Gan, Clemes, Limsombunchai, and Weng (2006)	New Zealand	reliability, assurance, responsiveness, control, enjoyment, intent to use, financial risk, performance risk, physical risk, social risk, psychological risk, age, employment, education, income, residence	Gender, marital status, price factors, service product characteristics, ethnic group
Polasik and Wisniewski (2009)	Poland	perceived security, familiarity with the Internet, exposure to online banking advertisements, use of other banking products, demographics	Access to broadband Internet connection
Fock and Koh (2006)	Singapore	trust, affective commitment, calculative commitment, security, regulatory control, technology advancement, reputation	ethics, privacy, openness, speed of response
Aldas-Manzano, Lassala-Navarre, Ruiz-Mafe, and Sanz-Blas (2009)	Spain	perceived risk, customer innovativeness, performance risk, security risk, social risk, time loss risk, privacy risk	
Chatchawanwan, Chaipoopiratana, and Combs (2009)	Thailand	attitude, complexity, compatibility, relative advantage, trialability, perceived usefulness, perceived ease of use	

## APPENDIX II

### **Behavioral Intention** (Venkatesh et al. 2003)

1. I intend to use Internet banking in the next few months.
2. I predict that I would use Internet banking in the next few months.
3. I plan to use Internet banking in the next few months.

### **Performance Expectancy** (Venkatesh et al. 2003)

1. I expect Internet banking will be useful in my life.
2. Using Internet banking will enable me to accomplish transactions more quickly.
3. Using Internet banking will increase my productivity.
4. Using Internet banking will enhance my effectiveness.
5. Use of Internet banking will significantly increase the quality of my transactions.
6. If I use Internet banking I will increase the quantity of output for the same amount of effort.

### **Effort Expectancy** (Venkatesh et al. 2003)

1. I expect that my interaction with the Internet banking would be clear and understandable.
2. I expect it would be easy for me to become skillful at using Internet banking.
3. I expect Internet banking to be easy to use.
4. Learning to operate Internet banking will be easy for me.
5. I expect Internet banking to be flexible to interact with.
6. Working with Internet is not complicated, it is easy to understand what is going on.

### **Social Influence** (Venkatesh et al. 2003)

1. People who influence my behavior think that I should use Internet banking.
2. People who are important to me think that I should use Internet banking.
3. The senior management of the bank has been helpful in the use of Internet banking. (dropped)
4. In general, the bank has supported the use of Internet banking. (dropped)
5. People in my environment who use Internet banking have more prestige than those who do not.

### **Perceived Facilitating Conditions** (Venkatesh et al. 2003)

1. I have the resources necessary to use Internet banking.
2. I have the knowledge necessary to use Internet banking.
3. Internet Banking is compatible with other systems I use. (dropped)
4. A specific person (or group) is available for assistance with Internet banking difficulties. (dropped)
5. Guidance will be available to me in the usage of Internet banking. (dropped)

### **Self-efficacy** (Venkatesh et al. 2003)

#### **I could complete a transaction using Internet banking ...**

1. ... If there was no one around to tell me what to do as I go.
2. ... If I could call someone for help if I got stuck.
3. ... If I had a lot of time to complete the job I started.
4. ... If I had just the built-in help facility for assistance.
5. ... If I had never used a system like it before.
6. ... If someone else had helped me get started.

### **Anxiety** (Venkatesh et al. 2003)

1. I feel apprehensive about using Internet banking.
2. It scares me to think that I could lose important information using Internet banking by hitting the wrong key.
3. I hesitate to use Internet banking for fear of making mistakes I cannot correct.
4. Internet banking is somewhat intimidating to me.

### **Personal Innovativeness** (Agarwal & Prasad 1998)

1. I would look for ways to experiment with it.
2. Among my peers, I am usually the first to try out new information technologies.
3. In general, I would not hesitate to try out new information technology.
4. I like to experiment with new (information) technologies.



**Perceived Trust** (Koufaris & Hampton-Sosa, 2002)

1. It is easy for me to trust Internet banking systems.
2. My tendency to trust Internet banking is high.
3. I tend to trust Internet banking, even though I have little or no knowledge of it.
4. Trusting the Internet is not difficult.

**Perceived Risk** (Pavlou 2003)

1. How would you characterize the decision to transact using Internet banking?  
(Risky → Not risky (dropped))
2. How would you characterize the decision to conduct transactions using Internet banking? (Very negative → Very positive).
3. How would you characterize the decision to use Internet banking? (High loss → High gain)

**Locus of Control** (Kay 1990)

1. I don't need an experienced person nearby when I use Internet banking.
2. I can make the computer do what I want it to do.
3. I don't need someone to tell me the best way to use Internet banking.
4. I feel confident about using the Internet to make my financial transactions. (dropped)
5. If I had a problem using the Internet, I could solve it one way or another.

Note: Items that did not meet loading criteria (> 0.50) are indicated as dropped.

Note: Items were measured with seven point likert scale ranging from 1—Strongly Disagree to 7—Strongly Agree except for Risk Propensity utilized a seven point likert scale; item 1 (1—Risky to 7—Not Risky); item 2 (1—Very Negative to 7—Very Positive); and item 3 (1—High Loss to 7—High Gain).

### APPENDIX III. FINAL FACTOR ANALYSIS

Item	PE	LOC	EE	SE	PT	Anx	SI	BI	PI	PFC	PR
BI1	0.299	0.170	0.143	0.137	0.177	-0.038	0.092	<b>0.747</b>	0.034	0.120	0.076
BI2	0.210	0.222	0.080	0.153	0.148	-0.017	0.208	<b>0.786</b>	0.099	0.069	-0.023
BI3	0.246	0.104	0.114	0.106	0.185	-0.105	0.106	<b>0.780</b>	0.095	-0.044	0.020
PE1	<b>0.742</b>	0.028	0.145	0.035	0.228	-0.064	0.108	0.244	0.064	-0.010	0.047
PE2	<b>0.853</b>	-0.006	0.152	0.069	0.144	-0.065	0.058	0.142	0.086	0.043	0.042
PE3	<b>0.870</b>	0.072	0.127	0.064	0.062	-0.054	0.087	0.144	0.107	0.055	0.018
PE4	<b>0.851</b>	0.111	0.152	0.164	0.097	-0.096	0.053	0.117	0.046	0.061	0.021
PE5	<b>0.812</b>	0.126	0.259	0.149	0.082	-0.011	0.174	0.072	0.032	0.004	-0.020
PE6	<b>0.703</b>	0.108	0.322	0.058	0.090	0.004	0.168	0.033	0.031	-0.010	0.045
EE1	0.216	0.035	<b>0.675</b>	0.242	0.075	-0.115	0.130	0.117	0.267	0.008	-0.008
EE2	0.239	0.014	<b>0.754</b>	0.160	0.078	-0.104	0.111	0.117	0.233	0.095	-0.033
EE3	0.267	0.107	<b>0.805</b>	0.072	0.123	-0.107	0.043	-0.014	0.085	0.034	0.029
EE4	0.117	0.347	<b>0.710</b>	0.123	0.086	-0.014	0.103	0.133	0.053	0.121	-0.009
EE5	0.318	0.090	<b>0.590</b>	0.099	0.278	-0.019	0.086	0.089	-0.077	0.192	0.087
EE6	0.219	0.198	<b>0.707</b>	0.206	0.211	-0.071	0.109	0.028	-0.077	0.017	0.004
SI1	0.227	0.152	0.131	0.136	0.214	-0.076	<b>0.778</b>	0.098	0.104	0.108	0.055
SI2	0.212	0.078	0.182	0.169	0.168	-0.017	<b>0.779</b>	0.125	-0.017	0.162	0.019
SI5	0.137	0.249	0.104	0.090	0.076	0.058	<b>0.679</b>	0.131	0.074	0.008	0.021
PFC4	0.094	0.153	0.147	0.180	0.045	0.027	0.118	0.004	0.171	<b>0.847</b>	0.000
PFC5	0.009	0.396	0.196	0.228	0.103	-0.082	0.165	0.155	0.004	<b>0.698</b>	0.053
SE1	0.036	0.395	0.302	<b>0.538</b>	0.098	-0.020	0.019	0.193	0.030	0.145	0.011
SE2	0.120	0.110	0.140	<b>0.786</b>	0.107	0.018	0.072	0.067	0.140	0.059	0.043
SE3	0.129	0.186	0.121	<b>0.798</b>	0.111	-0.034	0.080	0.025	0.077	0.106	0.027
SE4	0.079	0.193	0.123	<b>0.736</b>	0.074	0.025	0.107	0.060	0.076	0.165	0.089
SE5	0.007	0.427	0.153	<b>0.514</b>	0.044	0.052	0.314	0.105	-0.003	-0.017	0.044
SE6	0.122	-0.023	0.103	<b>0.736</b>	0.129	0.079	0.067	0.105	0.148	-0.005	0.103
Anx1	-0.066	0.046	-0.049	-0.007	-0.130	<b>0.804</b>	0.045	0.071	0.007	0.101	0.062
Anx2	-0.071	-0.087	-0.057	0.079	-0.051	<b>0.877</b>	-0.052	0.000	-0.004	0.012	0.095
Anx3	-0.008	-0.003	-0.092	0.013	0.019	<b>0.861</b>	-0.055	-0.111	-0.052	-0.055	0.041
Anx4	-0.073	-0.067	-0.076	0.002	-0.011	<b>0.846</b>	0.055	-0.088	0.005	-0.084	0.031
PT1	0.119	0.117	0.217	0.050	<b>0.818</b>	-0.054	0.133	0.072	0.107	0.055	0.017
PT2	0.176	0.230	0.164	0.114	<b>0.806</b>	-0.095	0.118	0.130	0.120	0.021	-0.015
PT3	0.106	0.096	0.072	0.169	<b>0.736</b>	0.053	0.233	0.199	0.123	0.018	0.111
PT4	0.221	0.154	0.151	0.164	<b>0.752</b>	-0.090	0.017	0.104	0.104	0.067	0.133
PI1	0.111	0.320	0.062	0.223	0.152	0.055	0.327	0.098	<b>0.548</b>	0.021	0.097
PI2	0.049	0.450	0.083	0.188	0.118	0.067	0.293	0.126	<b>0.600</b>	0.100	-0.045
PI3	0.167	0.362	0.200	0.217	0.211	-0.056	0.038	0.103	<b>0.678</b>	0.140	0.056
PI4	0.138	0.295	0.186	0.179	0.230	-0.078	-0.080	0.071	<b>0.714</b>	0.082	0.144
LOC1	0.063	<b>0.803</b>	0.103	0.076	0.106	-0.026	0.103	0.102	0.129	0.110	0.008
LOC2	0.091	<b>0.721</b>	0.143	0.159	0.087	0.006	0.097	0.016	0.232	0.127	0.079
LOC3	0.060	<b>0.844</b>	0.094	0.090	0.100	0.016	0.192	0.122	0.071	0.057	-0.032
LOC5	0.091	<b>0.727</b>	0.112	0.189	0.172	-0.117	0.008	0.095	0.139	0.114	0.122
PR2	0.079	0.068	-0.058	0.156	0.129	0.032	0.043	-0.017	0.133	0.062	<b>0.787</b>
PR3	0.017	0.070	0.075	0.059	0.054	0.197	0.031	0.063	0.005	-0.031	<b>0.820</b>
Eigenvalues	13.67	0.92	2.97	2.18	1.08	1.74	1.56	1.27	1.89	1.03	3.96
% Variance	31.06	2.08	6.75	4.96	2.45	3.96	3.54	2.89	4.29	2.35	8.99





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