Determinants of Behavioral Intention to Mobile Banking

Case From Yemen

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***Abstract*— Nowadays, new tools and technologies are emerging rapidly. They are often used cross-culturally before being tested for suitability and validity. However, they must be validated to ensure that they work with all users, not just part of them. Mobile banking (as a new technology tool) has been introduced assuming that it performs well concerning authentication, among all members of the society. Our research aimed to evaluate authentication mobile banking user acceptance, through Technology Acceptance Model (TAM), in Arabic countries, namely Yemen. The results confirm the previous studies that have shown the importance of perceived ease of use and perceived usefulness. Furthermore, perceived ease of use plays a determinant role.**

Keywords- Technology acceptance models; Mobile Banking; Arabic culture.

I. INTRODUCTION

Technologies make our lives easy but not secure [19] especially for financial issues. Most organizations already provide the services via the Internet and mobile appliances [18]. Furthermore, during the last ten years, the improvement of mobile communication technologies has changed the banking industry, as users are able to conduct banking services at anyplace and at any time [5] via mobile phones. Mobile Banking provides many services to the customers such as: requesting the balance and the latest transactions; transferring funds between accounts; buying and selling orders, for the stock exchange; and receiving portfolio and price information [2]. For individuals it would be difficult to remember their user names and PINs [14]. For that reason, many users select easy to remember passwords [3], which are considered a security trade-off. Security specialists are looking for more advanced techniques that would improve its performance [13].

Mobile Banking is still in a development phase in most countries especially middle-east, where small markets with few users have been reported. This is due to lack of customer acceptance and poor time response services [2]. In the other hand, mobile payments are mainly used with popular mobile services since there are few alternative payment solutions available [10].

There are three types of authentication [15]:

1) Something you know: a PIN, a password, or a passphrase.
2) Something you have: a passport, key, ATM card or cell-phone [6].
3) Something you are (Biometrics): fingerprints, signature, ear shape, keystroke, voice, finger geometry, iris, retina, DNA, hand geometry [11] and odour [16].

Acceptance of technology is a milestone [20]. It is very important to predict users' intention to use mobile banking [5] so various alternative approaches have been used to analyze customer's acceptance phenomenon. Within this context, TAM is one of the most widely accepted tools among information systems researchers [2].

In this paper we investigate the acceptance of mobile appliances, focusing in authentication effectiveness, in Arabic countries. The rest of the paper is organized as following: in Section 2 we overview the previous studies, as literature review; in Section 3 we describe our methodology and discuss results. We conclude and present future work in Section 4.

II. LITERATURE REVIEW

Khanfar et. al. [8] conducted the customer satisfaction with internet banking web site for a bank. Their covered factors were: customer support, security, ease of use, digital products/services, transaction and payment, information content, and innovation. The results found a narrow-based satisfaction with internet banking in all factors. They found that all factors have a positive impact on the customer satisfaction. Moreover, they found that there was no relation between all demographics data and customer satisfaction due to the high computer literacy among customers.

Gaurav et. al. [4] discussed Automatic Teller Machine (ATM) authentication techniques. They aimed to propose solution that uses the personal mobile devices to interact with the service outlets. They used public key Infrastructure for mutual authentication of the service and the personal device in their model. Their idea depends on the following policy:

- After users' registration, their mobile carries the public key whereas their smart card contains the private key.
- Mobile phone authenticates itself to ATM.
- Mobile phone establishes a session key using standard key exchange protocols such as Diffie-Hellman key

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exchange along with an integrated authentication to avoid man-in-middle attack.

- Users would access the service of the ATM using the signed application either loaded by the bank during registration or by the ATM.

So users need to carry only their personal devices to access various services. They did their simulation on different platforms.

AlZomai et. al. [1] discussed the authentication problems of security in online banking of using SMS for transactions. Their experiment aimed to simulate the online bank using website to do the transactions. They suggest enhancing online banking security by focusing on usability more than security technical and mechanisms. They suggested SMS authorization scheme. They attacked their approach to make sure that it would work properly. Their attack succeeded in 21%. They justified that as user should have more experience.

Gu et. al. [5] examined and validated the determinants of users' intention to mobile banking. They used a structural equation modeling (SEM) to test the causalities in the proposed model. They verified the effect of perceived usefulness, trust and perceived ease-of-use on behavioral intention in mobile banking. The results indicated strong support for the validity of proposed model with 72.2% of the variance in behavioral intention to mobile banking. The study also found that self-efficiency was the strongest antecedent of perceived ease-of-use, which directly and indirectly affected behavioral intention through perceived usefulness in mobile banking. In addition, they found that structural assurances were the strongest antecedent of trust, which could increase behavioral intention of mobile banking.

Hua et. al. [7] investigated the factors affect mobile commerce adoption in China and the United States. They conducted a survey on 190 individual mobile commerce users in China and USA. Results showed that there are several significant cultural differences on consumer intention to use mobile commerce.

Yaseen et. al. [21] used TAM model to study the m-commerce technology deployment in Jordan. They distributed 210 questionnaires to mobile commerce users in Stock Exchange for Brokers and Investors. Their factors were trust, perceived usefulness, perceived ease of use, social and cultural values and economic issues that influence a decision maker intention to adopt this type of technology in doing business. Their results showed that perceived trust, perceived usefulness, perceived ease of use, social and cultural values had significant association with intention to deploy mobile commerce technology while economical issue is not significant.

Maiyaki et. al. [9] studied determinants of consumer behavioral intention in Nigerian commercial banks. They investigated the influence of perceived service quality, perceived value, corporate image and switching cost on the consumer behavioral intention in the context of commercial banks in Nigeria. They found that the service of quality, customer perceived value and image of the corporate had significant influence on customer behavioral intention.

Barati et. al. [2] studied the factors that affect acceptance of mobile banking. They presented a set of factors that could potentially positively affect the success of mobile banking and should be taken into account by banks while adopting mobile technology as shown in Figure 1. They found that perceived usefulness and perceived ease of use are significant. Moreover they found that role of facilitating conditions in acceptance of mobile services is very important.

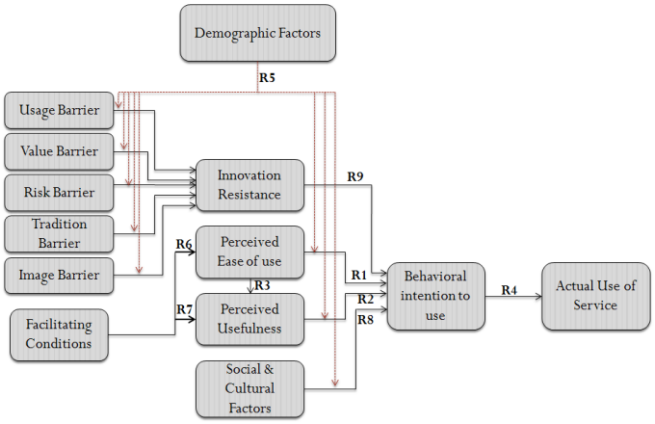

Figure 1: Acceptance model for Mobile Banking [2]

Ramayah et. al. [12] studied and examined the intention to use an online bill payment among part time MBA students in University Sciences Malaysia, Penang. They developed and modified the extended TAM and Social Cognitive Theory to identify factors that would determine and influence the intention to use an online bill payment system. They conducted a survey that involved 120 students. They found that perceived ease of use and perceived usefulness are the significant drivers of intention to use the online bill payment system. In addition to that, they found that subjective norm, image, result demonstrability and perceived ease of use were to be the key determinants of perceived usefulness whereas perceived risk was found to be negatively related to usefulness. Moreover, computer self-efficacy played a significant role in influencing the perceived ease of use of the online bill payment system.

III. METHODOLOGY AND DISCUSSION

TAM has two pillars that determine the users' acceptance of a new technology: perceived ease of use and perceived usefulness. Perceived ease of use is defined as the degree to which the users expect that the target system would require a low effort to learn to use, while perceived usefulness is defined as "the individuals' subjective probability of using a specific application system, will increase their job performance within an organizational context" [17].

Table 1 shows the research variables required by TAM and its characterization. Perceived ease of use and perceived of usefulness act as independent and dependent variables at the same time. Besides, the demographic factor is considered as independent, while intension to use acts as dependent as it

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depends on perceived ease of use and perceived of usefulness.

The research hypotheses are:

H1: Perceived ease of use will have a positive effect on intention to use Mobile Banking.

H2: Perceived usefulness will have a positive effect on intention to use Mobile Banking.

H3: Demographic factor will have a positive effect on intention to use Mobile Banking. Perceived performance is defined as the degree to which users expect that the target system would support the performance perceive. Saving time and effort is defined as the degree to which the users expect that the target system would save the time and effort when comparing with the old method. Social and cultural factors are defined as the degree to which the users expect that the social and cultural factors will affect its decide to use the target system. We directly asked the respondents about the mentioned factors to measure their intention and behaviour.

TABLE 1: RESEARCH VARIABLES

Variable	Type	Scale
Technology acceptance	Dependent	Discrete (1-5) 1: Extremely Likely 5: Extremely Dislikely
Perceive ease of use	Independent/Dependent	
Perceived usefulness	Independent/Dependent	
Demographic factor	Independent	

The factors affecting acceptance of Mobile Banking as a new technology in financial payments and transactions are presented in Table 2. The model expands TAM with innovation resistance, performance perceive saving time and effort, and social and cultural factors. Moreover, proposed model includes experience that represents the familiarity of the mobile device and ATM, technology use skills, etc.

Descriptive Analysis

As shown in Table 2, our sample consisted of 76% males and 24% females. The majority of the sample were young (48%) in the interval [21-30], 6% were less than 21. 33% were within the interval [31-40]. 47% of the respondents have post graduate degrees, 41% bachelor degree and most of them (54%) are proficient IT users. 89% of the respondents use ATM machines and 98% preferred to use it rather than dealing with a human being clerk. 78% of the respondents liked the idea 20% did not decide. 74% of the respondents considered using mobile banking easy 10% considered it as difficult and 16% did not decide.

87% of the respondents considered using mobile banking as a brilliant idea and 15% did not decide whether they considered mobile banking as good or bad idea. 5% considered it as a stupid idea. 45% intended to use mobile banking and 40% did not decide. 83% perceived the usefulness of using mobile banking and 15% did not decide. 90% of the respondents think that using Mobile Banking will improve the performance in their lives. 89% considered the idea would help in exploiting the time.

TABLE 2: SAMPLE PROFILE

Variable		Frequency
Gender	Female	76
	Male	24
Race	Yemenis	79
	Arab	21
Age	15-20	6
	21-30	48
	31-40	33
	More than 41	13
Specializations	IT	54
	Finance	5
	Administration	10
	Medicine	7
	Engineering	13
	Others	11
Jobs type	Public Sector	23
	International organizations	5
	Private Organization	41
	Family business	3
	Other	28

Figure 2 shows our proposed model for Mobile Banking acceptance. This model expands TAM adding factors such as experience, Innovation, performance, social factors, saving time. The experience of using mobile would affect the responses and similar technologies would help users to perceive both ease of use and usefulness.

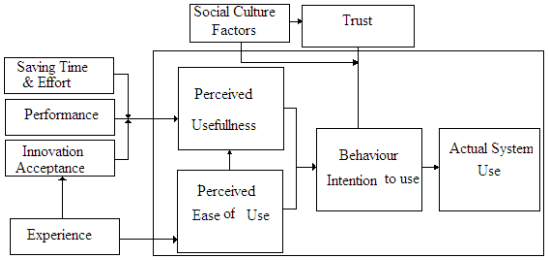

Figure 2: Proposed framework

The review showed that the demographic characteristics have an impact on the adoption of mobile technology. However, we find that age has no effect on intension to use mobile in financial transactions. Furthermore, we found that gender has significant effect as males have strong intention to use the new technologies more than females. Experience factor is significant. Social and cultural factors are important in acceptance of mobile banking. Mobile services are innovation and each innovation comes with resistance of consumers.

IV. CONCLUSION

Our sample consisted of young educated individuals. Moreover, most of them were frequent users of ATM machines and preferred to use technologies rather than the old methods.

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Our results confirm the previous studies results. However, they conflict with some of them. Our results find that both perceived ease of use and perceived of usefulness are significant factors. However, the results show that perceived ease of use plays the most significant role.

From our results, it can be concluded that many of participants accept mobile banking for reasons such as saving time and improvement of their daily life.

Most of participants think it is easy to use mobile banking and some think they need some help. The result shows the gap between accepts the new technology as an idea and the actual use of it. We recommend awareness campaign that leads to user perceptions for new technologies.

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