

A TECHNOLOGY ACCEPTANCE STUDY OF ONLINE BANKING SERVICE IN MALAYSIA

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Abstract: Online banking service (OBS) is new in Malaysia (introduced about 6 years ago). The study is the first research in Malaysia that investigates user acceptance of OBS based on Unified Theory of Acceptance and Use of Technology model (Venkatesh, Morris, Davis and Davis, 2003). Two hundred and eighty questionnaires were distributed and collected from two major cities, Kuala Lumpur and Melaka. Since this is a preliminary study, only descriptive statistics was used to analyse the data. The results show that Malaysians have intentions of using OBS (mean rating of close to 4.00). Moreover, Malaysians recognize the benefits of OBS by giving a high mean rating (close to 4.00) to performance expectancy. However, they give relative low mean ratings (close to 3.00) on other indicators of Behavioural Intention to Use OBS such as effort expectancy, social influence, facilitating conditions and perceived credibility. Recommendations were given to promote a safe, efficient and conducive environment for user adoption of online banking.

1 INTRODUCTION

Online banking service was introduced in Malaysia about six years ago (The Star, 2005). Although it is new, it has become one of the most popular services in Malaysia with 51% out of the total respondent base of 8,000 using online banking service (OBS) once a month (The Star, 2005). With 12 domestic banks offering OBS currently (Goi, 2005; The Star, 2005), OBS is an alternative (to physical banking) and new medium to reach more potential customers as it allows bankers to deliver banking products and services to a wider segment of customers through electronic and interactive communication channels particularly the Internet (Goi, 2005). However, if a bank offers OBS without a clear understanding of factors affecting customer adoption, the investment may be wasted due to the absence of vital business understanding to support customer adoption (Goi, 2005; Pires and Aisbett, 2002). Domestic banking institutions must therefore seek to better understand their customers in this area to prevent loss and maintain competitive advantage (Goi, 2005). Thus, the aim of the present study is to conduct a thorough research on the user acceptance and discover the factors that encourage and discourage the adoption of OBS. This research will provide domestic bankers

with an improved understanding of end-users' concerns and thus assist them in their efforts to offer better OBS that provides a more satisfactory response to consumers' needs. It also helps the government and Bank Negara Malaysia (central bank) to create a conducive and user-friendly environment that will promote full adoption of OBS.

1.1 Selection of UTAUT Model

Nowadays, researchers are confronted with a choice among a multitude of models to examine the user acceptance of a new technology where they always have to choose a "favoured model" and largely ignore the contributions from alternative models. To our knowledge, this research is the first in Malaysia, which applies Unified Theory of Acceptance and Use of Technology (UTAUT) model, a new, robust and powerful model, to measure the consumer adoption of OBS. The UTAUT model captures the essential elements of eight previously established models (i.e. Theory of Reasoned Action (TRA), Theory of Acceptance Model (TAM/TAM2), Theory of Planned Behaviour (TPB), Innovation Diffusion Theory (IDT), Motivational Model (MM), Model of Personal Computer Utilization (MPCU), Technology Acceptance Model (CTAM), Theory of Planned Behaviour (TPB) and Social Cognitive

Theory (SCT)) (Venkatesh, Morris, Davis and Davis, 2003). UTAUT has been found to outperform the above-mentioned theoretical frameworks as it is able to account for 70% of the variance (adjusted R^2) in technology acceptance, encompassing constructs such as performance expectancy, effort expectancy, social influence, facilitating conditions, self-efficacy, attitude toward using technology, and anxiety (Venkatesh et al., 2003). An additional factor i.e. perceived credibility is added to this model to measure issues such as security and privacy as this factor is highlighted in many OBS literature. The research model of this study is comprehensive and definitive. It redresses the limitations of existing user acceptance models (e.g. TAM/TAM2) by including barriers that would prevent an individual from using OBS (e.g. lack of expertise, and time or money constraint) into the study.

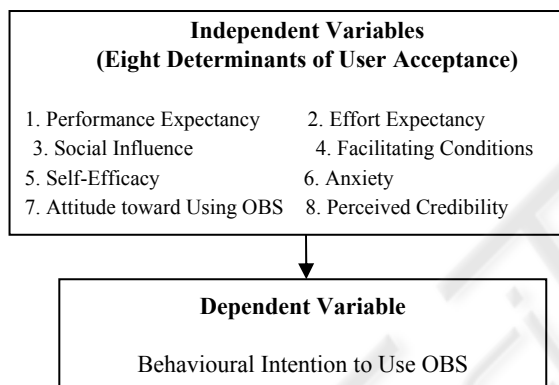


Figure 1: Research Framework.

Figure 1 shows the research framework of the study. There are 8 independent variables and one dependent variable.

1.1.1 Dependent Variable

User acceptance is defined as a person's psychological state with regard to his or her voluntary use and intention to use a technology (Dillon and Morris, 1996). It was discovered that some prior studies used attitude while others used behavioural intention or actual usage as the indicators of user acceptance (Sun and Zhang, 2004; Sun and Xiao, 2006). However, behavioural intention is confirmed to be a highly valid indicator of actual usage (Sun, 2003). Therefore, user acceptance is examined by intention to use (equivalent to behavioural intention) in the present study. The dependent variable in the present study is Behavioural Intention to Use OBS which is

measured by three items adapted from Venkatesh et al. (2003) (refer to Table 2: nos. 9-9.3).

Sustained usage of a new technology could be directly hindered or fostered by the accessibility of vital resources and opportunities (Venkatesh et al., 2003). The following independent variables are used to measure factors that will encourage and discourage Behavioural Intention to Use OBS.

1.1.2 Independent Variables

The first independent variable is Performance Expectancy. Better Performance Expectancy will lead to greater intention to use a technology (Agarwal and Prasad, 1998; Davis, 1989; Venkatesh and Davis, 2000; Venkatesh et al., 2003). Performance expectancy is defined as the degree to which an individual believes that using a service will help him or her to attain gains in job performance (Venkatesh et al., 2003). Being one of the strongest predictor of intention, usefulness and job-fit (Thompson, Higgins and Howard, 1991) are key attributes to measure Performance Expectancy.

Another important indicator for Behavioural Intention to use OBS is Effort Expectancy, which is defined as the degree of ease associated with the use of a technology (Venkatesh and Davis, 2000; Venkatesh and Morris, 2000; Venkatesh et al., 2003). This factor is significant only during the early adoption of a technology (e.g. first 3 months of service subscription). Perceived ease of use and complexity are crucial attributes to measure Effort Expectancy (Agarwal and Prasad, 1998; Davis, 1989; Thompson, Higgins and Howard, 1991).

The third indicator, Social Influence, is defined as the degree to which an individual perceives others' belief that they should use a new service (Venkatesh et al., 2003). This factor appears to be important only in the early stages (e.g. during service subscription) of individual experience with the technology. Its influence erodes over time, becomes insignificant during sustained usage (Venkatesh and Morris, 2000; Venkatesh et al., 2003). Social Influence alters an individual's belief structure, causing him or her to respond to potential social status gains (e.g. prestige) or potential social pressure (e.g. peer or family pressure) in the adoption of a new technology (Venkatesh et al., 2003).

The next indicator which has direct influence on Behavioural Intentions is Facilitating Conditions. It is defined as the degree to which an individual believes that a technical infrastructure exists to support the use of a service (Taylor and Todd, 1995,

Venkatesh et al., 2003). Perceived behavioural control (perceptions of technical and manpower resource constraints on behaviour), and compatibility (the degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters) are among the attributes of Facilitating Conditions (Venkatesh et al., 2003).

Forming trust or perceived credibility prior to service subscription has a significant impact on customer acceptance since customers generally stay away from a service provider whom they do not trust (Gefen and Silver, 1999; Reichheld and Scheffer, 2000). Perceived Credibility is “the belief that the promise of another can be relied upon even under unforeseen circumstances” (Suh and Han, 2002). Distrust (low perceived credibility) of service providers make consumers afraid of providing sensitive information such as financial details on the Internet (Suh and Han 2002).

The following variables, i.e. Attitude toward Using Technology, Self-Efficacy and Anxiety, are other vital determinants of user acceptance in UTAUT model (Venkatesh et al., 2003). Attitude toward Using Technology is defined as an individual’s overall affective reaction (liking, enjoyment, joy, and pleasure) to using a technology (Davis, 1989; Taylor and Todd, 1995; Thompson, Higgins and Howard, 1991). An individual’s positive or negative feelings (e.g. it is good/bad to use a service) and feelings of joy or displeasure (e.g. the innovation makes tasks more interesting / difficult) significantly affect his / her tendency to adopt a new technology in the near future (Venkatesh et al., 2003). Self-Efficacy is the judgment of one’s ability to use a technology (e.g. computer) to accomplish particular jobs or tasks (Compueau and Higgins, 1995). Since new innovations are often viewed as complex by inexperienced users, confidence in one’s ability to handle them can exert an important influence on consumer acceptance (Venkatesh et al., 2003). Anxiety is “evoking anxiety or emotional reactions when it comes to using a new technology” (Taylor and Todd, 1995). Unpleasant, strong and negative emotional states (e.g. frustration, confusion, anger) which arise during interaction with a new technology may affect productivity, learning, social relationships, and overall well-being (Compueau and Higgins, 1995, Taylor and Todd, 1995; Venkatesh and Morris, 2000).

2 METHODOLOGY

A survey questionnaire was distributed to a sample of 300 OBS users with Information-Technology and business background from two major cities in Malaysia, i.e. Malacca and Kuala Lumpur by using intercepts and snowball sampling methods. Since OBS is new (about six years in operation), it would be apt to first focus on urban areas before rural areas. Therefore, cities were selected in this research on the prospect that there would be more OBS users in urban areas. The response rate was 93.33% (280 respondents). All respondents managed to answer the questionnaire within 30 minutes. They expressed high enthusiasm in commenting on the attributes which deserve modification, clarification or removal. They were also willing to recommend other OBS users to answer the questionnaire. Results of the pilot study were analysed and presented in this paper. The measurement instrument comprised 58 questions on the eight determinants of user acceptance. Of these, 12 questions examined Performance Expectancy, 12 questions related to Effort Expectancy, six questions related to Social Influence, four questions related to Facilitating Conditions, nine questions related to Perceived Credibility, seven questions related to Anxiety, four questions related to Self-Efficacy, and four questions related to Attitude toward Using OBS. In addition, three questions on Behavioural Intention to Use OBS were also included in this measurement instrument. All the questions were rated using a 5-point Likert’s scale anchored by 1- Strongly Disagree, 2 – Disagree, 3 – Neutral/Unsure, 4 – Agree, 5 – Strongly Agree. The research data was analysed using descriptive statistics.

About half of the respondents in the present study are male (51.8%) while the remaining (48.2%) are female as indicated in Table 1. Among the respondents, 10.4% are Malays, 77.9% are Chinese and 11.8% are Indians. Sixty-two per cent of the respondents are in the 20 to 29 age-bracket while 31.1% of the respondents are 30 years of age and above. Nearly half of the respondents (48.2%) have 1 to 5 years’ experience in using OBS.

Table 1: Respondents' Profile.

		Number of cases	%
Gender	Male	145	51.8
	Female	135	48.2
	Malay	29	10.4
Race	Chinese	218	77.9
	Indian	33	11.8
	Below 20	19	6.8
Age	20-29	174	62.1
	30 and above	87	31.1
Number of Years of OBS Use	<1 year	119	42.5
	1-<5 years	135	48.2
	5 years and above	26	9.3

3 RESULTS

Mean and Standard Deviation for attributes measuring each independent and dependent variable in this study are shown in Table 2.

Table 2: Mean and Standard Deviation.

Variables	Mean	Standard Deviation
Independent Variables		
1. Performance Expectancy	3.81	0.981
1.1 I can manage my money online at anytime	3.83	1.057
1.2 I can keep a record of my finances	3.83	0.946
1.3 I need not visit traditional banks regularly	3.89	1.013
1.4 I can transfer money anytime and anywhere	3.94	0.886
1.5 I can save time paying essential bills at the post office	3.95	0.977
1.6 OBS is convenient and easy to access	3.86	1.044
1.7 OBS is efficient	3.87	0.928
1.8 OBS is effective	3.75	0.948
1.9 OBS improves productivity	3.76	1.063
1.10 OBS increases quality of output	3.64	0.959
1.11 OBS is useful	3.90	0.986
1.12 OBS fits into my lifestyle	3.55	0.964
2. Effort Expectancy	3.41	0.896
2.1 OBS is easy to learn	3.66	1.010
2.2 It is easy to do what I want to do by using OBS	3.50	0.950

Variables	Mean	Standard Deviation
2.3 OBS is easy to use	3.61	0.864
2.4 It is easy to become skilful in using OBS	3.55	0.866
2.5 Using OBS does not take too much time	3.61	0.893
2.6 Authentication code is easy to use	3.36	0.905
2.7 There is sufficient time for information entry	3.39	0.905
2.8 Fast information download	3.32	0.897
2.9 Easy web navigation	3.45	0.854
2.10 Detailed answers referring to Frequently Asked Questions (FAQs)	3.16	0.864
2.11 Comprehensive site map	3.16	0.845
2.12 Useful search engine	3.17	0.898
3. Social Influence	3.13	0.923
3.1 People who influence my behavior use OBS	3.01	0.900
3.2 Coworkers/classmates use OBS	3.40	0.990
3.3 Friends use OBS	3.14	1.031
3.4 People using OBS have high profile	3.15	0.825
3.5 People using OBS have more prestige	3.14	0.848
3.6 Most Malaysians like to use OBS	2.92	0.941
4. Facilitating Conditions	3.46	0.898
4.1 Basic system requirements for using OBS are met	3.60	0.967
4.2 All contents of OBS are easy to read and understand	3.38	0.872
4.3 Specific person (or group) is always available for assistance	3.38	0.879
4.4 The language in which the document is written is easily understood	3.46	0.875
5. Perceived Credibility	3.27	0.958
5.1 I trust in the ability of an online bank to protect my privacy and personal information	3.27	1.032
5.2 I believe no money will be lost in unauthorized electronic fund transfers	3.27	.942
5.3 I believe online bank would not sell my personal information to third parties	3.37	.949
5.4 Other people cannot view my bank account information	3.44	1.004
5.5 Online bank has enough specialists to detect fraud and information theft	3.27	.960

Table 2: Mean and Standard Deviation (Continued).

Variables	Mean	Standard Deviation
5.6 I am not worried about being deceived into a fake website	2.90	1.029
5.7 Current password generation is secure	3.17	.910
5.8 Sufficient guidance on password selection	3.23	.930
5.9 Customers are automatically locked out after failed login attempts	3.52	.867
6. Anxiety	3.13	1.048
6.1 I am afraid of high Internet connection cost	3.57	0.932
6.2 I am afraid of being charged for OBS	3.09	1.097
6.3 I am worried about the inaccessibility of OBS web pages	2.80	1.078
6.4 I don't know how to use OBS	3.40	1.032
6.5 I am afraid of losing information by hitting the wrong key	3.03	1.064
6.6 I am afraid of making mistakes that I cannot correct	2.81	1.152
6.7 OBS is intimidating to me	3.23	0.984
7. Self-Efficacy	2.98	1.033
7.1 I use OBS only if there is no one around me	3.00	1.137
7.2 I use OBS only if there is built-in help facility for assistance	2.99	0.939
7.3 I use OBS only if I could call someone for help	2.89	0.951
7.4 I use OBS only if I have a lot of time to learn and deal with the service	3.05	1.105
8. Attitude toward Using OBS	3.50	0.879
8.1 OBS makes banking tasks more interesting	3.50	0.855
8.2 I like working with OBS	3.44	0.857
8.3 It is a good idea to use OBS in daily life	3.64	0.878
8.4 OBS is enjoyable	3.40	0.926
Dependent Variable		
9. Behavioural Intention to Use OBS	3.83	0.893
9.1 I intend to use OBS in the near future	3.83	.919
9.2 I predict I would use OBS in the near future	3.81	.882
9.3 I plan to use OBS in the near future	3.84	.877

4 DISCUSSION AND RECOMMENDATIONS

Malaysians have high expectations on the performance of OBS (Table 2: No. 1) as shown by the average of 3.81 (close to 4.0). This finding is in line with earlier literature worldwide (Chau, 1996; Hsu and Chiu, 2004; Lederer, Maupin, Sena, and Zhuang, 2000), which revealed that the most important criterion in adopting OBS is the ability to enhance job performance without the inconvenience of having to travel, wait and worry about their personal safety while transacting money.

Standard deviation for the attribute "I need not visit traditional banks regularly" is higher than 1. This indicates that while some respondents think that OBS saves their troubles of visiting physical banks, others still prefer to visit the banks routinely. Perhaps security concerns discourage them from fully relying on OBS to transfer money and pay bills. As indicated by the attributes measuring Perceived Credibility in Table 2, some respondents think that online banks cannot protect their privacy and personal information from being stolen by hackers (No. 5.1: standard deviation = 1.032 > 1.0). Some even suspect that unauthorized persons may be able to access and view their bank account information (No. 5.4: standard deviation = 1.004 > 1.0). Inadequate knowledge of online banking security will probably reduce their intentions to use the technology and drive them to either visit traditional banks or maintain low amounts in online accounts. One of the main causes of consumers' unfamiliarity with online banking security measures is possibly due to the incomprehensible and lengthy security and privacy policies in the official websites of domestic banks. Customers may not have the time, patience and computer literacy to read and understand the policies. They may not understand some of the technical terms in the security policies, such as, firewalls, secure socket level, encryption, P3P policy, etc. Fake OBS website concern is another reason that deters some respondents from fully adopting OBS (No. 5.6: mean = 2.90, standard deviation = 1.029 > 1.0). Wide news coverage on the particular issue may have raised their awareness and sensitivity toward the authenticity of an OBS website. Therefore, domestic bankers should conduct consumer education programmes (e.g. seminars, exhibitions, etc.) to reveal their security policies to customers in layman's terms and educate them about ways to identify a fake website. The effectiveness of these consumer education programmes should be periodically evaluated.

Instead of solely relying on banks to tackle phishing, fraudulent websites, and identity theft, consumers should be encouraged to report on fraudulent attempts to obtain their authentication credentials (e.g., attempts to steal username, password, etc.). As revealed by Unisys (2007), Malaysians have nominated Internet identity theft as one of the top three security concerns, similar to those in developed countries such as Australia. Ninety-two per cent of them look forward to having extra security techniques to protect their identity while using OBS (Unisys, 2007). Therefore, Bank Negara Malaysia (central bank) should develop industry-wide best security standards such as two-factor authentication technique which uses transaction authorization code (TAC), digital certificate, smart card or fingerprints in authentication besides username and passwords. Regular report supervision and on-site examinations should be in place to make it mandatory for all domestic banks to comply with the standards issued. However, one important point to consider is security is inversely related to effort expectancy (Lawson, 1998). There should be a balance between these two factors, i.e. the security features implemented should not make OBS too difficult for the users, thus discouraging them from using it.

One of the attributes measuring Effort Expectancy, i.e. "OBS is easy to learn", in Table 2 (No. 2.1) has high standard deviation (>1.0), indicating that while some respondents enjoy learning OBS, others find it difficult to become skilled at using OBS. Similar result is observed in the rating of an attribute measuring Anxiety, i.e. "I am worried about the inaccessibility of OBS web pages" (No. 6.3: standard deviation = $1.078 > 1.0$). The difference in perceptions may arise from different personal experience in using the service. This study consists of 42.5% of respondents with less than 1 year experience in using OBS (Table 1), who may perceive OBS as difficult to learn and access due to the lack of personal experience in dealing with the new service. As discovered by Davis (1989)'s study, the more a service is perceived as easy to learn and access, the more likely the service is used extensively. Therefore, to promote the ease of learning and accessing OBS, domestic banks should consider giving free demonstrations and trials to the public at schools or shopping complexes.

Respondents are unsure about the OBS adoption among their coworkers/ classmates and people who influence their behaviours (Table 2; No. 3; mean = 3.13; standard deviation = 0.923). In other words,

social circles do not have a strong influence on a person's OBS adoption. This contradicts with Venkatesh and Davis's (2000) research in the United States which claimed that social influence is particularly important in the early stages of technology adoption. Perhaps numerous OBS advertisements in mass media have an influence on consumers' adoptions. Malaysians may be attracted to using OBS by its efficiency and effectiveness as widely advertised. This can be seen in Table 2 where efficiency (No. 1.7) and effectiveness (No. 1.8) have high mean ratings of close to 4.0.

High standard deviations (> 1.0) for most attributes measuring Anxiety factor in Table 2 (Nos. 6.2–6.6) indicate that while some respondents take pleasure in using OBS, others are afraid to use OBS due to cost concern, poor Internet connection, knowledge deficiency, and the apprehension of losing important information by hitting the wrong key and making mistakes that they cannot correct. An OBS acceptance study in Australia (Lichtenstein and Williamson, 2006) highlighted similar consumer anxieties. However, these anxieties could be alleviated by improving the quality of the Internet service, standardizing OBS cost structure and intensifying nationwide education programmes.

Respondents are unsure about the availability of technical infrastructure and comprehensible contents to support the use of OBS (Facilitating Conditions; Nos. 4.2, 4.3 and 4.4). In contrast with Taiwanese who are confident in their capability to use OBS (Hsu and Chiu, 2004), Malaysians are unsure of the existence of a call centre that can assist them with OBS (Nos. 4.3). This concern may lower their interest to use OBS (note: the attribute "OBS is enjoyable" has a low mean rating of 3.40; see No. 8.4) and hinder them from fully utilizing the benefits and convenience of OBS. Hence, it is recommended that adequate resources (written instructions, specific person (or group) for assistance) should always be ready to support the use of OBS. Domestic banks should guarantee customers with intensive customer service through call centers where customers can easily seek assistance and guidance when in doubt. The government and Bank Negara Malaysia need to closely review business policies and operating practices of domestic banks and ensure the availability of adequate technical support and secure technologies (e.g. firewalls, two-factor authentications, secure socket level, etc.) before approving the launch of a new OBS.

Despite the above-mentioned worries, respondents show high intention of using OBS (Table 2: No. 9). This ascertains Goi (2005) and

Nielsen (2005)'s findings that online banking industry has high opportunity for growth and user acceptance is the key determinant for the growth. To increase user acceptance, domestic banking institutions should emphasise on providing high level service. To do so, they need to reassess their business practices to be consistent with the needs and demands of consumers. The above-mentioned recommendations are derived from consumers' demands on OBS; thus, if they are implemented, a very conducive environment will be created to provide high level OBS.

5 LIMITATIONS AND FUTURE STUDIES

Preliminary results of factor analysis of independent factors and dependent factors show a high construct validity of 60.71% and 78.93%, respectively. In addition, the Cronbach's Alpha coefficients indicate high internal consistency in the respondents' answers (with Alpha coefficients greater than 0.60). Multiple linear regression showed that Performance Expectancy is one of the most important predictors of Behaviour Intention to Use OBS, which concurs with the descriptive statistics results above. Due to the constraint on the length of paper, the full results of the factor analysis, multiple linear regression and the effects of moderating variables such as education level, income, age, etc. will be examined and presented in our future papers. The results of this study are only applicable to Malaysia where all the subjects are from. However, the study can be replicated in other countries using the same model and instrument to identify factors that encourage and discourage the adoption of OBS in those countries.

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