Factors Affecting Internet Banking Adoption among Young Adults:

Evidence from Malaysia

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Abstract—**This paper investigated the factors that influence the use of Internet banking services among young Malaysian adults. It is becoming critical for bank managers to understand their customers in order to deliver services effectively. This group of users happens to be the most targeted, and understanding them is essential. The conceptual framework is based on extended Technology Acceptance Model with six independent variables. We selected a sample of 310 participants using convenience-sampling method. Data analysis was then based on 229 valid responses. Results indicate that perceived ease of use, perceived usefulness, relative advantage, self-efficacy, perceived credibility and trialability tend to influence consumers to adopt Internet banking. The findings would be useful for literature development in the subject area, particularly in Malaysia. The findings would also be useful to theoretical development in Internet banking.**

Keywords-Internet banking; technology acceptance model; Malaysia; Internet adoption; young adults

I. INTRODUCTION

The emergence of the Internet has changed the industry structures as well as enabled new players to enter existing industries and caused existing firms to change the ways they compete. Hence, knowledge and communication technology have an increasingly great role in modern banking, especially when directly accessible by the bank's customers. Bátiz-Lazo and Wood [1] found that customer-oriented inventions became more important in 1980-1995: the "diffusion period of the information revolution in commercial banking". This was mainly achievable with presence of personal computer (PC), which helps in developing relationships between customers and banks electronically. However, it was only after the emergence of the Internet, that banks are capable to provide real-time electronic transactions to many customers without any software installation on the client's PC [1].

Some research studies have been conducted on Internet banking, but only a few focused on young adults, especially one on undergraduates [2]. Other authors include Suganthi, Balachandher and Balachandran [3]; Ndubisi, Supinah and Guriting [4]; Ndubisi and Sinti [5], and they all focused on Internet banking among Malaysians as a whole. Internet banking adoption in Malaysia tends to be low based on previous reports, and there is limited study on the factors affecting its usage. According to Ndubisi and Sinti [5], in Malaysia, Internet banking research is still in its infancy, which makes it hard for banks and other interested parties to design interventions that would enhance the diffusion of the Internet banking transaction oriented features (e.g. speed, interactivity, clarity of procedural information, etc.) and nontransaction oriented factors (e.g. hedonism) on Internet banking adoption. Black, Lockett, Ennew, Winklhofer and McKechnie [6] also indicated in one of the few interpretive studies of Internet banking adoption, that there is a need for further in-depth investigations of not only the adoption issues but also the relationships between the variables. In addition, there is the emergence of a society of individuals who seek personalized consumption, and new markets seeking deep levels of consumer support whose provision relies on new strategies of customer relationship management and knowledge management [7], and attention to the customer experience.

Based on the aforementioned, we examined the factors that influence young Malaysian adults to use the Internet for their banking transactions. In order to address the research issues in this paper, we review existing works on Internet banking adoption including research methods appropriate for this paper, and then we applied them to the context of Malaysia.

II. CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESES

A. Perceived Ease of Use

According to Davis [8], perceived ease of use was defined as the extent to which an individual thinks that it

would be effortless to use a particular system. Perceived ease of use refers to the user's perception of the level of easiness to use the system [9]. The harder the system execution is, the less likely it is that the system is used as extensively as would be desirable or that it would have started being used in general. Venkatesh and Davis [10] found that perceived ease of use had positive direct effect on user acceptance of information system.

B. Perceived Usefulness

Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his/her job performance [8]. The Technology Acceptance Model (TAM) was introduced by Davis in year 1989 [8]. According to the TAM, perceived usefulness is a significant factor that affects user acceptance in information system research [8]. Several researchers have provided evidence of significant effect of perceived usefulness on information system usage (Davis [8]; Pikkarainen, Pikkarainen, Karjaluoto and Pahnila [11]; Wang, Wang, Lin and Tang [12]. Sudarraj and Wu [13] validated that perceived usefulness was a very important factor for determining online banking usage in Canada. Chau and Lai [14] and Eriksson, Kerem and Nilsson [15] also found similar results. Therefore, customers would normally accept online banking systems if they believe the system to be helpful.

C. Relative Advantage

Tornatzky and Klein [16] found relative advantage to be an important factor in determining adoption of innovations. In general, perceived relative advantage of an innovation is positively related to its rate of adoption [17]. For instance, Internet banking services offer convenience as well as advantages to the clients as they are able to access bank account from anywhere and whenever they want. Moreover, these kinds of services ease clients' financial management as they can access their bank account information easily. In view of the advantages that Internet banking services offer, it would thus be expected that individuals who perceive Internet banking as advantages would be likely to adopt the service as well [18].

D. Self-Efficacy

Self-efficacy refers to how confident a person is in oneself [9]. Vainio [9] stated that, some people may be very confident in themselves just because that is their nature, whereas others are those who are competent in something and should feel confident in doing it, but do not. Self-efficacy of someone could be affected with his/her learning ability including other factors. It is, therefore, suggested that the more the user believes on his ability to use the system, the more likely it is that the user will start using the said system in his/her work.

E. Perceived Credibility

According to Wang, Wang, Lin and Tang [12], perceived credibility consists of two elements: privacy and security. Security refers to the protection of information from unsanctioned intrusions or outflows. A common and widely recognized obstacle to electronic commerce adoption has been the lack of security and privacy over the Internet [19][20][21]. Wang, Wang, Lin and Tang [12] found that perceived credibility had a significant positive effect on intentions to adopt. In addition, Ramayah and Ling [22] found that Internet banking users were very concerned about security and majority of them were using Internet banking for accounts enquiry only due to the credibility concern. Suganthi, Balachandher and Balachandran [3], Daniel [23] and O' Connel [24] found that security concern was important in affecting the acceptance and adoption of new technology or innovation.

F. Trialability

Rogers [17], Agarwal and Prasad [25] stated that potential adopters of new technology, who are allowed to experiment with it, would feel comfortable with it and thus be more likely to adopt it. In addition, according to Tan and Teo [18], if customers were given the chance to try the innovation, it would minimize certain unknown fears, especially when customers found that mistakes could be rectified and thus providing a predictable situation.

G. Conceptual Framework

Based on the conceptual framework, we identified six independent variables that are hypothesized to affect the dependent variable (Internet banking adoption). The conceptual framework in based on Technology Acceptance Model (TAM). We extended the model by incorporating four additional variables. These variables were analyzed in this study. Adoption of Internet banking would be affected by these variables either positively or negatively based. These independent variables are perceived ease of use, perceived usefulness, relative advantage, self-efficacy, perceived credibility and trialability. Fig. 1 shows the research framework for this paper.
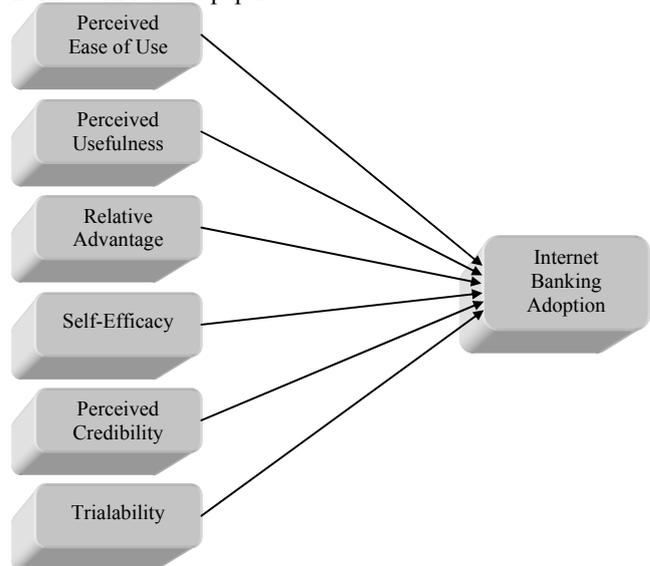

Figure 1.   Research framework of customers' adoption of Internet banking in Malaysia.

Therefore, the following hypotheses are developed:

H1: Perceived ease of use will have a positive effect on user acceptance of Internet banking.

H2: Perceived usefulness will have a positive effect on user acceptance of Internet banking.

H3: Perceived relative advantage will have a positive effect on user acceptance of Internet banking.

H4: Self-efficacy will have a positive effect on user acceptance of Internet banking.

H5: Perceived credibility will have a positive effect on user acceptance of Internet banking.

H6: Trialability will have a positive effect on user acceptance of Internet banking.

III. METHODOLOGY

We distributed 310 survey questionnaires to participants in Malaysia using personal administration method. We used convenience-sampling method to select the participants because it is considered an effortless approach to get respondents to participate in a study of this nature. In addition, prior related researches have used similar method in selecting participants. This sampling method is commonly used in information systems research. It is also cost effective as we can select anyone to be a participant with ease. The target participants in this study were young Malaysians aged between 18-28 years. The questionnaire was designed based on existing related and consists of two sections. The first section contains the demographic questions such as age, ethnicity, and Internet usage profile, and the second section consists of the conceptual variables identified earlier in this paper and they were measured using a five-point Likert scale. We also conducted a pilot study to evaluate the face validity of the questionnaire and made relevant changes in the questionnaire to reflect the suggestions of participants in the pilot study. We also conduct content analysis by inviting four experts in the subject area to review the questionnaire before sending out the questionnaire for the main data collection.

IV. DATA ANALYSIS

Of 310 distributed questionnaires, 81 of them were discarded, resulting in a 73.87% response rate. Table I shows the general demographic profile of the respondents.

TABLE I.   RESPONDENTS DEMOGRAPHIC PROFILE

Demographic	Frequency	Percentage	Cumulative Percentage
Gender			
Male	76	33.2	33.2
Female	153	66.8	100.0
Ethnicity			
Chinese	178	77.7	77.7
Malay	16	7.0	84.7
Indian	21	9.2	93.9
Others	14	6.1	100.0
Age			
18-20 years	48	20.9	20.9
21-23 years	165	72.1	93.0
24-28 years	16	7.0	100.0
Income (RM)			
< 1000	211	92.1	92.1
1000 – 1999	15	6.6	98.7

2000 – 2999	2	0.9	99.6
≥ 3000	1	0.4	100.0
Visit bank frequency			
Never	14	6.1	6.1
At least once a month	149	65.1	71.2
Weekly	43	18.8	90.0
A few times a week	18	7.8	97.8
Daily	5	2.2	100.0
Use of ATM			
Never/Almost never	5	2.2	2.2
At least once a month	65	28.4	30.6
A few times a month	112	48.9	79.5
A few times a week	42	18.3	97.8
Daily	4	1.8	99.6
A few times a day	1	0.4	100.0
Banks used			
Maybank	16	7.0	7.0
CIMB bank	88	38.4	45.4
Public bank	1	0.4	45.8
OCBC bank	2	0.9	46.7
Others	2	0.9	47.6
CIMB and Maybank	65	28.4	76.0
CIMB, Public bank	25	10.9	86.9
CIMB, Maybank and Public bank	16	7.0	93.9
CIMB and others	10	4.4	98.3
Maybank and Public bank	1	0.4	98.7
Maybank, CIMB and OCBC bank	2	0.9	99.6
All four banks	1	0.4	100.0
Daily usage			
Never/ Almost never	2	0.9	0.9
Less than one hour	9	3.9	4.8
1-2 hours	22	9.6	14.4
3-4 hours	62	27.1	41.5
5-6 hours	64	27.9	69.4
More than 6 hours	70	30.6	100.0
Access Internet			
Home	215	93.9	93.9
Office	2	0.9	94.8
School	11	4.8	99.6
Cyber cafe	1	0.4	100.0
Used Internet banking before			
Yes	214	93.4	93.4
No	15	6.6	100.0
Internet usage (monthly)			
Never	2	0.9	0.9
At least once a month	26	11.4	12.3
A few times a month	16	7.0	19.3
A few times a week	15	6.6	25.9
Daily	129	56.2	82.1
A few times a day	41	17.9	100.0
Internet Service Provider			
Streamyx	207	90.5	90.5
Jaring	1	0.4	90.9
Celcom broadband	8	3.5	94.4
Maxis broadband	4	1.7	96.1
I don't have Internet at home	4	1.7	97.8
Others	5	2.2	100.0

Table I depicts that most of the respondents were females (66.8%). In addition, majority of the respondents (77.7%) were Chinese. On income, majority of the respondents (92.1%) were from the income group that earns less than RM1000 per month suggesting that most of the respondents may be college students. Most of the respondents 65.1%) visited bank at least once in a month. The table also shows that almost half of the respondents used ATM (48.9%). The authors found that 90.4% of the total respondents hold a CIMB bank account. Most of the respondents (85.6%) used

the Internet for more than 2 hours a day. The data also indicate that majority of the respondents (93.9%) accessed the Internet from home. In addition, it is evident that most of the respondents (93.4%) had experienced Internet banking before. More respondents (56.2%) use the Internet everyday. Most of them (90.5%) use Streamyx as their main Internet Service Provider.

Table II shows the Cronbach's Alpha value for all variables. Nunnally [26] indicated that a value of 0.7 Cronbach's Alpha or higher is considered acceptable. The statistics show that all variables exhibited values ranging 0.714 to 0.805, which suggests that the data are reliable and consistent with acceptable research standards.

Table III reveals the correlation matrix of the conceptual variables. A two-tail test at 0.05 significance level indicates that there are positive relationships among the variables (both dependent variable and the independent variables).

We employed multiple regression analysis to test the hypotheses. Table IV shows the analysis of coefficients for specific relationships.

TABLE II. RELIABILITY ANALYSIS FOR INDEPENDENT AND DEPENDENT VARIABLE

Variable	No of Item	Mean	Cronbach's Alpha
Perceived Ease Of Use	8	3.6954	0.714
Perceived Usefulness	6	3.5509	0.805
Relative Advantage	7	3.7405	0.744
Self-Efficacy	7	3.4161	0.719
Perceived Credibility	9	3.6507	0.735
Trialability	6	3.6739	0.726
Customer Adoption	6	3.6376	0.717

TABLE III. CORRELATION MATRIX AMONG CONSTRUCTS

Constructs	PEOU	PU	RA	SE	PC	T
PEOU	1.000	0.438**	0.429**	0.263**	0.381**	0.368**
PU		1.000	0.634**	0.460**	0.408**	0.423**
RA			1.000	0.379**	0.373**	0.504**
SE				1.000	0.249**	0.303**
PC					1.000	0.397**
T						1.000

**Correlation is significant at 0.05 level
PEOU: Perceived Ease of Use, PU: Perceived Usefulness, RA: Relative Advantage, SE: Self-Efficacy, PC: Perceived Credibility, T: Trialability

TABLE IV. MULTIPLE REGRESSION ANALYSIS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.045	0.309		-.145	0.885
PEOU	0.179	0.078	0.132	2.305	0.022
PU	0.136	0.060	0.157	2.271	0.024
RA	0.156	0.065	0.162	2.382	0.018
SE	0.157	0.068	0.129	2.308	0.022
PC	0.149	0.067	0.125	2.207	0.028
T	0.239	0.057	0.251	4.219	0.000

PEOU: Perceived Ease of Use, PU: Perceived Usefulness, RA: Relative Advantage, SE: Self-Efficacy, PC: Perceived Credibility, T: Trialability; F-Statistics: 32.932; R^2: 0.471

In the column of unstandardised coefficient, the estimated coefficients indicates β (constant) is -0.045,

βPEOU is 0.179, βPU is 0.136, βRA is 0.156, βSE is 0.157, βPC is 0.149 and βT is 0.239. The result shows that all six variables are significant at 0.05 significance level (< 0.05). This indicates that the independent variables (perceived ease of use, perceived usefulness, perceived relative advantage, self-efficacy, perceived credibility and trialability) have a positive influence on Internet banking adoption.

V. DISCUSSION

Generally, the findings in this paper supported the predictive validity of six factors, namely, perceived ease of use, perceived usefulness, perceived relative advantage, self-efficacy, perceived credibility and trialability. This indicates that these variables are important in Internet banking services usage among young Malaysians. Perceived ease of use was found to positively affect user acceptance of Internet banking. This is consistent with previous research findings (Davis [8]; Vainio [9]; Venkatesh and Davis [10]). Respondents perceived the system to be easy to use and did not require loads of knowledge. This may be related to the fact that the majority of the respondents were young adults, and therefore tend to be more computer and Internet literate than most other age groups.

From the results, it is evident that perceived usefulness positively influences the use of Internet banking among young Malaysian adults. According to Davis [8], perceived usefulness is the degree to which a person believes that using a particular system would enhance his/her job performance. This result is consistent with findings from previous research. The findings indicate that respondents were keen on the advantages a system would offer them if they used it relative to other systems. The advantages include convenience of the system like ability to use anytime and anywhere. Tan and Teo [18] also found relative advantage to have a positive influence on the adoption of Internet banking. Self-efficacy was based on the assumption that one's confidence in the ability to use a system would influence the adoption of a particular system. This meant that users who are confident in their abilities to use the Internet banking services were more likely to adopt such services. This result is consistent with the findings by Tan and Teo [18]; Hill, Smith and Mann [27]. Self-efficacy was also found to have a positive relationship with perceived ease of use. This was consistent with research by Amin [2].

Perceived credibility consists mainly of two elements: privacy and security. In this study, it was found to have a positive effect on intention to use the system. This indicates that H5 was supported. Bhimani [19]; Cockburn and Wilson [20]; Quelch and Klein [21] all identified lack of security and privacy over the Internet as a risky undertaking and found it to have a negative relationship with Internet banking. This suggests that individuals, who perceived Internet banking as a low risk activity, would be inspired to adopt participate in it. The findings also indicate that trialability had a p-value of 0.000. This is consistent with previous findings. Tan and Teo [18] also found that majority of their respondents valued trialability in terms of influencing them to adopt Internet banking.

VI. CONCLUSION

The findings in this paper can be applied by banks that offer Internet banking services. Banks in Malaysia can use the findings to enhance the promotion of banking services. Although most banks offer the service, not as many people as they would hope are actually using the system. Banks could therefore launch campaigns to raise awareness to more people. These campaigns can mostly be in universities (since most young adults are university students) as well as road shows. The campaigns can be used to mostly educate more on the relative advantage of using the system as well as show how to handle and protect themselves regarding security and privacy issues. Campaigns can also be used to boost confidence among those with low self-efficacy through demonstrations at bank branches using a one-on-one consultancy system.

The findings in this paper can also be used to help banks better understand young adults' behaviour in Malaysia with respect to Internet banking. This could enable banks to formulate effective techniques to attract this group to use this service.

One of the limitations of this study was that the respondents were from only one location and may not represent the entire young adult population in Malaysia as some areas e.g. rural areas, might be influenced by different adoption factors. In addition, future research should consider the responses from nonusers. This will enable a stronger and a more balanced perspective on the research issues.

Finally, banks could also include extra features on their websites to make the experience more memorable and fun. A plain web site may be appealing to older audience but not to young adults. An example of an extra feature is having promotions that are only applicable to online transactions like those that CIMB does with its Octopus collection. Transaction costs should also be minimal: having similar cost, as physical bank does not make the system appealing.

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