ADOPTION INTENTION OF BANKS' CUSTOMERS ON INTERNET BANKING SERVICE

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Failures in launching technological innovations inevitably have considerable costs and understanding these costs is important for organizations which are introducing new products and services into the marketplace. This article considers the said issue with reference to the adoption of internet banking services in Thailand. A questionnaire was used to examine the relationship between acceptance and customer characteristics and perceived characteristics of internet banking. Using logistic regression analysis, six significant explanatory variables were uncovered: opinion leadership, relative advantage, complexity, trialability, compatibility, and telephone banking usage.

OVERVIEW OF INTERNET BANKING

Because of increased competition, banks have had to develop new technologies and tools to remain competitive and meet the evolving requirements of consumers. The development of the ATM, for example, revolutionized banking and internet banking follows up on this innovation (David, Army, & Chou, 2000). Internet banking allows customers to make use of banking services from their web-enabled computers twenty-four hours a day, seven days a week, wherever they are located. This provides greater convenience, and presumably satisfaction, for the consumer; for the bank it provides cost-savings in relation

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to branch or telephone services, the collection of consumer information, and stronger customer relationships for the bank (Sayawadhera & Foky, 2000). This might imply that this new technology should gain wide acceptance, as did the use of ATMs.

Internet Banking in Thailand

In Thailand, internet banking is still in its early stages. Only a few banks are developing such services while others merely use the web to provide information about products and services. An inhibiting factor is concern whether there is demand for such services, based on concerns about levels of computer ownership, Internet usage, and consumer acceptance (Booz, Allen & Hamilton, 1996).

Thailand still has a relatively low rate of internet usage due to the relatively high price of personal computers and accessories and the hourly fees charged by Internet Service Providers (Arnat, 2000). Even among those who have the technological capacity for using the service there remains the question of acceptance of the new tool. Unfamiliarity and perceived complexity led to low adoption rates for telephone banking (Arnat, 2000). Similarly, only a small number of customers use ATMs for services other than cash withdrawal (McKinsey and Co's, 2000). Thus, it can be concluded that bank customers are still not accustomed to using electronic channels to manage their financial affairs. This resistence to adoption is an indication of the hazards of introducing new products and services into the marketplace; the vast majority of product and service innovations fail, at considerable cost to the companies introducing them (Foxall, 1984). If banks are to reap the benefits of internet banking they must identify how the service is perceived by potential adopters and the characteristics of consumers who will tend to adopt it. Moreover, those services perceived as necessary by such adopters must also be identified.

The identification of personal characteristics related to the adoption of internet banking is critical for market targeting and the identification of innovative features can help banks in product design and in formulating campaigns that will encourage the adoption of the service. In this study these are related to adoption intention, which is defined as an individual decision to try Internet banking service within a specified period of time.

THEORETICAL BACKGROUND

Diffusion and adoption models of perceived characteristics of innovation and personal characteristics of innovators dominate the literature(Rogers, 1995; Lockett and Litter, 1997) but since this study focuses on intention behavior, the theory of reasoned-action with belief

decompos-ition is also used (Taylor and Todd, 1995).

CONCEPT OF INNOVATION

An innovation is defined as a product, idea or practice perceived as new by individuals or some other unit of adoption (Rogers, 1995). "Newness" is defined in terms of the level of exposure consumers have to it (Schiffman and Kanuk, 1994). Rogers (1995) suggests five factors for evaluating the perceived attributes of products or services: *relative advantage*, *compatibility*, *observability*, *trialability,* and *complexity*. The first four are positively and the last is negatively associated with adoption. Gatignon and Robertson (1989) bring together complexity, compatibility and trialability as *customer learning requirements*. *Perceived risk* was identified by Ostlund (1974) and adopted by Lockett and Litter (1997) and Daniel (1998). Also suggested as negative factors have been *cost* and *social relevance* (Lockett and Litter, 1997; Gatignon and Robertson, 1989). Such factors may affect an innovation's rate of adoption (Lockett and Litter, 1997) and in designing a marketing program it is crucial to identify which of these factors are relevant (Kotler, 1997).

Personal Characteristics of Innovators

Consumer innovators are the relatively small group of consumers who are the early purchasers of a particular new product, although some people may have general tendency to adopt new products. It is crucial for marketers to identify these early adopters and target their initial campaigns to them.

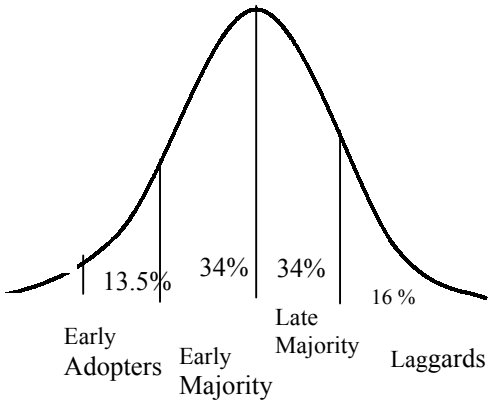

Figure 1: The Sequence & Proportion of Adopter Categories

Source: Everett M. Rogers, *Diffusion of Innovations*, 3rd Ed. New York: The Free Press,1983.

Empirical studies have shown that innovators tend to be *younger* (Schiffman and Kanuk, 1994) and *have higher incomes* than later adopters or non-innovators (LaBay and Kinnear, 1981). They tend to be *more inner-directed* (Donnelly, 1970; Lockett and Litter, 1997), *more willing to take risks,* and to have a higher degree of *opinion leadership*, that is they receive information and pass it along to others. Moreover, they consistently are characterized by using a product type

heavily and to have experience with related products (Gatignon and Robertson, 1989).

The TRA with Belief Decomposition Model

According to theory-of-reasoned-action (TRA), behavior (B) is a direct function of behavioral intention (BI). The intention is in turn preceded by two major determinants which are attitude (A) and subjective norm (SN) (Schiffman and Kanuk, 1994). In a study of consumer adoption intentions for a new product, Taylor and Todd (1995) proposed a modification of TRA by categorizing attitudinal beliefs into relative advantage, compatibility, and complexity (see figure 2), which were found to be significantly related to attitude, which in turn is related to purchase intention.

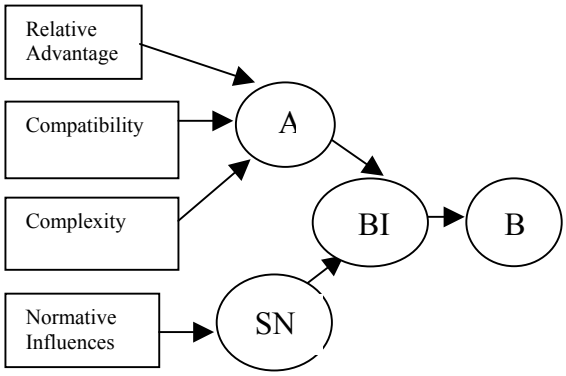

Figure2: TRE with Belief Decomposition
Source: Adapted from "Decomposition & Crossover Effects in the Theory of Planned Behavior: A Study of Consumer Adoption Intention" *International Journal of Research in Marketing*, by Taylor & Todd, 1995.

RESEARCH MODEL

The proposed model that is the basis of this study (see figure 3) is represented in terms of two sets of independent variables, which describe the adoption of new products and services. These were hypothesized to be related to adoption characteristics.

One set of independent variables relates to a *customer's personal characteristics* and the other to *the perceived characteristics of the service*. The perceived characteristics of Internet banking service model in this study consists of five factors: relative advantage, customer learning requirement, perceived risk, cost, and social value. The relative advantage of internet banking was measured in terms of economic benefits, convenience and improved service level. The customer learning requirement was treated in terms of Rogers' (1995) dimensions - *complexity*, *compatibility* and *trialability*. Potential adopters' perceived risks toward Internet banking was measured by *functional risk* and *security risk*. Innovation cost in this study involved purchase cost and *usage cost*. The social value of an innovation relates to whether it has a level of social value that tends to generate social imitation (Gatignon and Robertson, 1986).

The personal characteristics considered in this study were socioeconomic factors, personality traits, social characteristics, and product

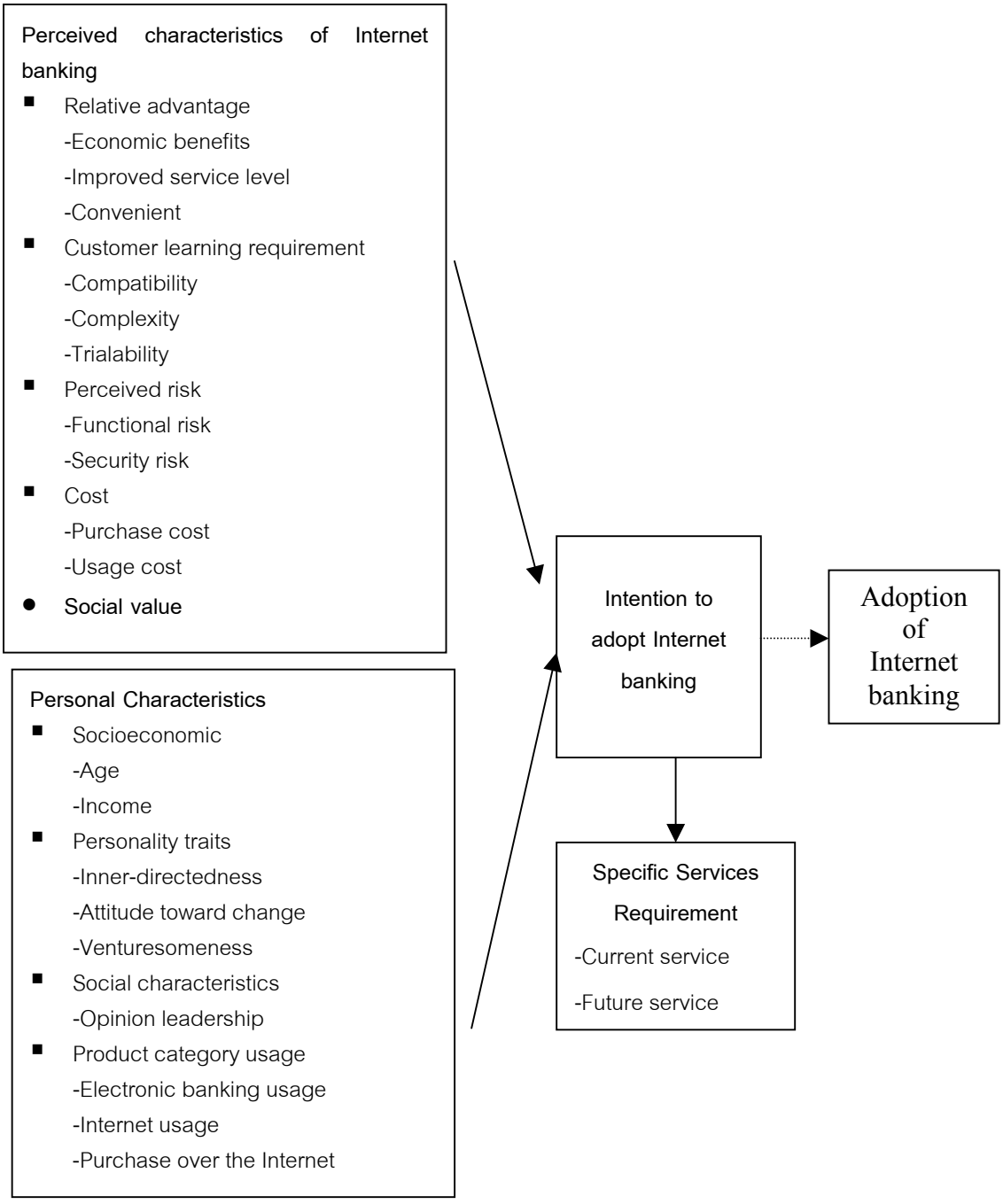

Figure 3: Framework of Study

usage. The socioeconomic factors used in this study were *age* and *income*. The social characteristic was measured in terms of *opinion leadership*. Personality traits considered were *inner-directedness*, *attitude toward change* and *venturesomeness*. Product-related categories relating were *electronic banking service usage*, *Internet usage*, and purchases over the Internet.

RESEARCH METHODOLOGY

Research Design/ Data Collection

The study used a self-administered questionnaire, given directly to respondents, for data collection. The data was collected during January 3-January 18, 2001. The population for the study consisted of employed persons who have used the Internet and who have bank accounts. A sample of 407 was selected; three subsamples made up this sample: government employees/civil servants, employees of state enterprises, and employees of private company. The sample size was in line with similar marketing research studies (Mathotra, 2000).

Measurement of the Variables

The research model presented in Figure 3 contains three main variables – perceived characteristics of Internet banking service, personal characteristics, and intention to adopt Internet banking service. The perceived characteristics of the service were measured by five-point Likert scale, ranging from strongly disagree to strongly agree (See Appendix II: Table 1). A Likert scale was used for measurement of perceived characteristics in other studies on innovation adoption (Taylor and Todd, 1994; Lockett and Littler, 1997; Thong, 1999). Most items concerning personal characteristics involved responses to attitudinal statements, each of which employed the five-point Likert scale. Other items used ratio and interval scales (see Appendix II: Table 2). To measure intention to adopt the service, a dichotomous yes/no scale was employed.

DATA ANALYSIS

Descriptive Analysis

About 70% of the respondents indicated that they would like to try internet banking in the next three to six months; the most important three services that those interested in adopting internet banking are listed in Table 1. The data in Table 2 indicates that and 51% of the respondents who answered the question wanted banks to offer an on-line account opening service and 51% wanted an on-line loan decision service.

Table 1: Service Performed via Internet Banking

Rank	Type of Service
1	Balance Inquiry
2	Money transfer
3	Information Inquiry

Table 2: Type of Future Service Required to be Offered by Bank

Service	Count	%Responses	%Case
Purchase Insurance	63	12.7	21.6
Brokerage	63	12.7	21.6
On-line Account Opening	224	45.0	76.7
On-line Loan Decision	148	29.7	50.7
Total responses	498	100.00	170.5

Note: 115 missing cases; 292 valid cases

Hypothesis Testing

The hypothesis was tested by (binary) logistic regression analysis, a multivariate technique used to predict the presence or absence of a characteristic or outcome based on values of a set of predictor variables. The technique is similar to a linear regression model but is suitable for models where the dependent variable is dichotomous. Independent variables can be categorical (i.e. ordinal) interval and ratio data (Norusis, 2000). To select predictor variables, the forward stepwise regression method was used. Forward stepwise starts with a model that contains only the constant. Variables are examined based on entry and removal criteria (Norusis, 1999).

Results

The following table summarizes all variables significantly associated with intention to adopt, where B is the regression coefficient, SE is the standard error of B and Sig. is the likelihood of the variable actually being statistically insignificant. The remaining variables were not significant and dropped from the model by the regression analysis program.

Table 3: Logistic Regression Analysis: Forward Stepwise (Wald)

Variable	B	S.E.	Sig.
Saving	.645	.216	.003
Complex	-.459	.180	.011
Selfuse	.425	.207	.041
Triable	.471	.192	.014
Techadv	.669	.164	.000
Telebank	.552	.236	.019
Constant	5.644	1.440	.000
Negelkerke R^2 = .298			

Opinion leadership in technological matters (Techadv) and relative advantage for economic gains from timesaving (Saving) were significantly related to adoption intention at the 1% level. Customer learning requirements measured by perceived complexity (Complex), trialability (Triable), and compatibility (Selfuse) were found to be significant at the 5% level. Lastly,

previous use of telephone banking usage (Telebank) was significant at the 5% level.

The best fitting model was as followings:

ln[odds] = -5.644 + .645(saving)
- .459(complex) + .425 (selfuse)
+ .471(triable) + .66(techadv)
+ .552(telebank)

The logistic coefficient is interpreted as the change in the log odds (the ratio of the probability that an event will occur to the probability that it will not) associated with a one-unit change in the independent variable. Examples are given in appendix II.

Goodness of Fit

Negelkerke R^2 assesses the goodness of fit of all variables in the model in logistic regression analysis. This statistic quantifies the proportion of explained "variation" in the logistic regression model and is similar in to the R^2 in a linear regression model (Norusis, 1999). The Negelkerke R^2 was about 30% in this study, indicating that 30% of variability in dependent variable (adoption intention) was explained by the six variables in table 3.

Conclusion and Recommendation

This study yielded useful conclusions related to adoption of internet banking services.

Product design

Complexity and trialability are important factors that must be taken into account when designing an Internet banking web site. Transactions should be simple and user friendly. To ensure trialability, banks might offer *online demonstrations* that allows customers to try out the service, this can help alleviate fears that the service might be too complex. The design should also allow the addition of services like account opening and online loan decisions along with basic services such as balance inquiry, money transfer and information inquiry.

Promotional Campaign and Advertising

Since compatibility was positively related to intention to adopt the service, the promotional campaign and advertising should make those resisting adoption better able to understand the advantages and simpilicity of using internet banking. The campaign should also especially target opinion leaders, who can be expected to encourage others to adopt by word-of-mouth processes.

Further Implication for Research

The proposed model using the characteristics of innovation and the

personal characteristics could be generalized and employed in other research relating to innovation adoption.

In addition, since the research focused on intended behavior of Internet banking service usage, additional study should be conducted to measure actual adoption of the service. Prediction of specific behavior based on intention measured before the behavior occurs may not be very accurate. Several factors such as intervening time, unforeseen environmental events, stability of intention and new information received can reduce or weaken the relationship between measured behavioral intention and observed behavior (Peter and Olson, 1990). Then, the results between these two measurements (i.e. behavioral intention and actual behavior) must be compared to see any differences under the consideration of those stated factors.

Appendix I -Table 1: Measurement for Perceived Characteristics of Internet Banking

Variable	Sub-variable	Statement	Variable label**	Scale
■ Relative Advantage	Economic benefits	- Internet banking service helps you to save time from visiting branch banks to conduct banking transactions.	Saving	1-5
	Convenience	- You can access your account and deal with your bank from anywhere with your PC.	Access	1-5
		- Internet banking allows you to conduct your banking business 24 hours/day without waiting for bank's opening hours.	Availbty	1-5
	Improved Service Level	- You will feel more satisfied as Internet banking allows you to conduct banking business faster with online services.	Fast	1-5
		- By using Internet banking service, you are more willing to deal with a bank and conduct banking business more frequently.	Frequent	1-5
■ Customer Learning Requirement	Complexity	- You feel that conducting banking transactions via the Internet are too complicated.	Complex	1-5
		- You find that it is difficult to learn how to conduct banking business online.	Learning	1-5
		- You find that it is not easy to remember User ID and confidential password when using Internet banking service.	Password	1-5
	Compatibility	- You find bank opening hours to be very inconvenient.	Openhrs	1-5
		- Internet banking service can meet your need for ability to manage financial matter by your own without visiting branch bank.	Selfuse	1-5
	Trialability	- It would not take you much effort to try using Internet banking service.	Triable	1-5

Appendix I-Table 1 (Continue) Measurement for Perceived Characteristics of Internet Banking

Variable	Sub-variable	Statement	Variable label**	Scale
■ Perceived Risk	Functional Risk	- Conducting banking business over the Internet allows greater risk of error than dealing with tellers at a branch bank.	Error	1-5
	Security Risk	- You would feel uneasy when dealing with a bank via the Internet since your account and personal information could be accessed by a hacker or an unauthorized person.	Hacker	1-5
		- You are apprehensive about conducting banking business through the Internet as computer virus could harm your information and your computer.	Virus	1-5
■ Cost	Purchase Cost	- You consider that the purchase cost of computer and/or modem could hamper your decision to use Internet banking	Purchase	1-5
	Usage Cost	- You find that the benefit of conducting banking business over the Internet (i.e. you do not have to make time and effort to go to the bank) cannot outweigh the price of ISP subscription fee and telephone call (to link with the ISP).	Usecost	1-5
■ Social Value	Social value	- You will esteem yourself as a technology innovator when using Internet banking service.	Esteem	1-5

Appendix I-Table 2: Measurement for Personal Characteristics

Variable	Sub-variable	Question /Statement	Variable label**	Scale
■ Age		- How old are you?	Age	Ratio
■ Income		- What is your average monthly income?	Income	1-7
■ Personality Trait	Innerdirected-ness	- When making a decision on purchase of new technology product, you will rely on your own judgement and personal standard more than advice from other	Ownjudge	1-5
	Venturesome-ness	- You like to be among the first people to buy and use new products or services that are on the market.	Firstbuy	1-5
	Attitude toward Change	- You are interested to hear about new technology developments. - Technology development has improved your life.	Interest Techdvt	1-5
■ Opinion Leader		- Other people often ask for your advice on financial matters. - Other people often ask for your advice on new technology products.	Finadv Techadv	1-5
■ Product Category Usage	Electronic Banking Service Usage	- How often do you visit ATM monthly? - How often do you use telephone banking monthly?	Visitatm Telebank	0-4
	Internet Usage	- How many hours a week do you use Internet?	Nethour	0-5
	Purchase Over the Internet	- How many times do you purchase over the Internet	Netbuy	0-4

Remark: ** Variable labels in Table 1 and Table 2 were considered as individual independent variables when they were statistically tested.

Appendix III

Logistic Regression Equation

The interpretation of the results of a logistic regression equation is difficult since the equation estimates the logarithm of the odds of a favorable answer to the intent question. What is really more useful is the probability that a respondent evaluating the statements for six significant variables would actually give a favorable response to that question. In order to do this, first the anti-logarithm of the result is taken. This provides the odds that someone would provide a response of 'yes' to a question when converted into a probability. In general, if the odds of event A happening are 'a:b', then the probability of A happening is

a/(a+b)

The following table presents some examples of possible responses to the six significant variables and the probabilities are calculated. Response 1, given by a person who has a negative intent. Responses 2 and 3 provide the value for a one-unit increase in Savings and response 4 is an average response.

Note that this suggests that if the banks can establish just a slightly more favorable response, the probability of a positive intent will increase. What is left to be done is to determine whether the positive response to intent question will translate into positive usage of the Internet.

Variable	B	R1	R2	R3	R4
Constant	-5.644				
Saving	0.645	2	3	4	3
Complex	-0.459	4	4	4	3
Selfuse	0.425	2	2	2	3
Triable	0.471	2	2	2	3
Techadv	0.66	2	2	2	3
Telebank	0.552	2	2	2	3
		-1.97	-1.329	-0.68	1.238
	odds	0.139	0.265	0.505	3.449
	prob.	0.12	0.21	0.34	0.78

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