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Developing the electronic service acceptance model from Internet securities trading system

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Abstract

This study examines the antecedents of electronic service acceptance in the context of Internet securities trading. The survey results, from a sample of securities investors show five antecedents that have a positive impact on perceived usefulness: ease of use, information quality, accessibility, trust, and flow-control of the securities trading process. Respondents see the highest benefit in the flow-control of the securities trading processes via the Internet channel. Investors prefer to have the freedom to control details of the trading process when trading securities. In this context, the results suggest that trust may be a better antecedent to perceived usefulness and attitude toward usage, rather than a parallel, direct determinant of intention to use.

Keywords

Electronic service, perceived usefulness, trust, flow-control

INTRODUCTION

Electronic service via a web channel is one option that companies can use to provide support to customers and to allow them to make online business transactions. Customers can gain more control and experience through this channel in part because it allows them to navigate websites to compare information before making purchases. Despite the impressive benefits of the web, customers mainly use it for information, but still hesitate to conduct financial transactions via this channel. In contrast to traditional commerce, electronic service via the web channel has some notable barriers.

For instance, customers frequently mistrust the system security (Rotchanakitumnuai and Speece 2004; Sathye 1999). This is just one aspect of trust; in general, the role of trust is one important factor to the success of electronic commerce (e.g. Gefen et al. 2003; Pavlou and Gefen 2004). Service via the web channel sometimes cannot deliver on the promises and does not build customer trust, such as when there are reliability problems with the system (Jones et al. 2000). This could lead to a lowered level of electronic service acceptance via the web channel. Thus, securities trading, one of the most information intensive and risk prone financial services sectors, is an interesting case for service innovation toward using the Internet for securities trading.

Empirical studies of the Technology Acceptance Model (TAM) have found that information technology usage depends on two beliefs: perceived ease of use and perceived usefulness of the system (Davis 1989; Mathieson 1991). In this model, perceived ease of use has a positive impact on perceived usefulness, which has a direct impact on attitude toward usage. Further, intention to use is determined by attitude toward usage and by perceived usefulness. The TAM has been applied to explain an individual's adoption and usage of computer tools and systems such as word processing, spreadsheets, e-mail, voice mail, and intranet systems (Adam et al. 1992; Chau 1996; Horton et al. 2001; Mathieson 1991; Venkatesh et al. 2003). This model has not been validated for explaining electronic service acceptance, although there are some studies that have supported the use of TAM in the WWW context (Gefen et al. 2003; Hsu and Chiu 2004; Lederer et al. 2000; Suh and Han 2002).

However, there has been little empirical research on the antecedents of TAM's constructs in the specific context of Internet securities trading. Bhattacherjee (2000) has applied the theory of planned behavior to explain electronic trading acceptance but did not explain much about the impact of antecedents of perceived usefulness and their impact. Extending the TAM model to electronic service acceptance constitutes an important research issue due to the characteristics of electronic service (e.g., elements of web design and user interface, types of information contained in the website, and the ability of the web-based service provider to implement electronic service successfully). Understanding the antecedents of electronic service acceptance is important because of their major role in determining users' acceptance and usage in the uncertain and risky environment of using the Internet for financial

purposes. Therefore, research on electronic service acceptance will provide useful information, especially at this early stage of development and implementation.

The purpose of this study is to examine whether investment in Internet securities trading technology has resulted in acceptance among Thai investors, in terms of creating effective perceived ease of use, perceived usefulness and trust. In 2003, the Stock Exchange of Thailand (SET) responded to the increasing potential of web technologies by implementing Internet securities trading, believing that the Internet trading channels can provide substantial benefits to investors (e.g., save time and lower transaction costs). Thus, Thailand is a good context in which to see how consumers view the new technology shortly after it has been introduced. The Thai situation allows examination of how much investors' adoption and effective usage of Internet securities trading depends on usefulness, trust, and associated ease of use factors. These must be investigated and analyzed, so that customer value can be maximized.

In addition, this study also gives particular attention to investors' perception of the trust that the Internet securities trading system may be able to build. The study aims to explore the consequences of perceived usefulness and trust on attitude toward usage, and the impact of perceived usefulness, attitude toward usage and trust on behavioral intention to use the electronic service.

THEORETICAL BACKGROUND

The Technology Acceptance Model (TAM) is a widely used theoretical model that explains IT adoption and usage (Davis 1989). The TAM posits two specific beliefs among potential users: perceived ease of use and perceived usefulness. These two beliefs can predict attitude toward usage, which then can determine intention to use. Some studies have assessed the TAM in the web context, and tested TAM as a model for explaining WWW usage. Lederer et al. (2000), for example, ran an exploratory investigation into the antecedents of perceived ease of use and perceived usefulness. Ease of understanding and ease of finding information have an influence on perceived ease of use. Other studies suggested key ease of use problems such as speed of download, page organization, navigation and interface, language, and aesthetic design (Pitkow and Kehol 1996). In addition, perceived usefulness of the web system has been employed in studying computer system acceptance (Davis et al. 1989; Chau 1996; Vankatesh and Davis 2000). In the web context, electronic service usefulness may derive from the information quality provided to the web users. Further, the online investor is both a transaction maker and a computer user, so examination of the user's ability to control the flow process can be integrated into the research framework. When interacting with electronic commerce, consumers have a different working environment, they can be more demanding, and they perceive more control of their shopping expeditions, giving them more power relative to the supplier. The web environment provides an online customer experience to web users. Novak et al. (1999) indicated that enjoyment is an important determinant of customers' adoption of electronic commerce. Additionally, they perceive more control over their environment and actions. Holbrook and Hirschman (1992) suggested that users of technology-based services prefer self-service systems that allow them to indulge. Some online merchants utilize the flow-control process of the interaction to get customers to participate in the entire purchase experience by involving them in determining their own service or product specification.

Despite an advantageous flow-control process, the use of web technology could still be restricted if there is a lack of customer trust in the web system. Trust building is a crucial element in the social exchange process. Trust in web technology is one of the most important barrier issues for customers reported in prior research (Farhoomand et al. 2000; Pavlou and Gefen 2004; Rotchanakitumnuai and Speece 2004). Trustworthiness of electronic commerce can be derived from two perspectives: trust in the service provider and trust in the web system. The three main attributes that have been found to create trust in the service provider are benevolence, integrity and the ability of the service provider. Benevolence is the perception that the trusted party desires to do good things rather than maximize profit. Integrity means the customer believes that the trusted party will be honest and implement an acceptable set of policies. For example, privacy is one major concern of customers who adopt web technology. Customers do not want their information to be used in an inappropriate manner or misused by others over the Internet. Privacy depends on the service provider policy, such as a requirement that the customer has to give consent to allow their personal information to be revealed. Finally, ability consists of the skills and competencies of the trustees to do what needs to be done successfully. In this study it relates to the competencies of the electronic service provider of the Internet service.

RESEARCH MODEL AND HYPOTHESES

Each construct and the associated hypotheses are briefly reviewed here. Intensified levels of perceived usefulness in the electronic services include many antecedents.

Ease of use on websites can enhance online users' beliefs that the amount of effort needed to use a website is low (Lederer, 2000). Enhanced levels of the electronic service perceived ease of use includes the following determinants: easy to use, easy to read, uses understandable terms, able to link to search for related information, easy to return to previous page or jump to next page, and easy to load (Lederer et al. 2000; Pitkow and Kehoe 1996). Extensive TAM studies provide support for the positive relationship between ease of use and perceived usefulness. Ease of use affects perceived usefulness across many contexts, such as software, intranet, and WWW (Davis et al. 1989, Horton et al. 2001; Lederer et al. 2000; Venkatesh et al. 2000). Gefen et al. (2000) indicated that the relationship predicted by TAM can also apply to electronic commerce. Thus, the first hypothesis is**:**

H1: The higher the level of ease of use, the greater the perceived usefulness.

Information quality can be determined by several characteristics, such as accuracy, being up-to-date, and relevance (Edmunds and Morris 2000). Information quality should also support analysis and assist users to make decisions (Anthony 1965; Lederer et al. 2001). In addition, the Internet channel provides information accessibility benefits that enable users to access the service provider's websites more efficiently (Daugherty et al. 1995). Further, the benefit determinant that individuals derive from the flow can create concentration (Koufaris 2002). In the traditional securities trading, investors normally have a personal relationship with the marketing staff of the brokerage firm when they want to make an order or sell their securities. Web-based self service provides users with more freedom and control over their activities when they are visiting the websites. Internet securities trading investors can take advantage of the capability of this system and concentrate on their securities trading decision. Concentration has been found to have a positive impact on user's experience of web usage (Novak et al. 1999). As explained above, all these antecedents assist in building perceived usefulness (Lederer et al. 2000; Lin and Lu 2000; Novak et al. 1999; Rotchankitumnuai and Speece 2004). Thus, the next three hypotheses are proposed.

H2: The higher the level of information quality, the greater the perceived usefulness of the electronic service.

H3: The higher the level of accessibility, the greater the perceived usefulness of the electronic service.

H4: The higher the level of flow-control, the greater the perceived usefulness of the electronic service.

Trust is important in electronic service adoption (Gefen, 2003, Pavlou and Gefen 2004; Rotchanakitumnuai and Speece 2004). Gefen et al. (2003) found that higher levels of trust can enhance perceived usefulness. Many customers' distrust of the web system is related to security, system failure and reliability, and the ability of the electronic service provider (de Ruyter et al. 2001; Mcknight et al. 2002). Customers are concerned about the consequences of making transactions via the web channel. There is a little disagreement about the direction of this relationship. In an Internet banking context, Suh and Han (2002) argue that the relationship between trust and perceived usefulness in the opposite direction, suggesting that the perceived usefulness is the antecedent of trust. Thus, to date, the literature paints a fragmented and conflicting view about the relationship between trust and perceived usefulness, although it is more common to see trust as the antecedent. Our own in-depth interviews with experts (noted in the discussion of methodology section) supported the majority view. The experts indicated that trust should be the antecedent of perceived usefulness because without trust in the electronic system, perceived usefulness sometimes cannot guarantee that customers will actually conduct financial transaction via the web. In research on corporate banking, Rotchanakitumnuai and Speece (2003) found that corporate customers of Thai banks do realize that Internet banking is useful, but they do not trust the system and hesitate to make financial transactions via a web channel. Hence the next hypothesis for this study is:

H5: The higher the level of trust, the greater the perceived usefulness of the electronic service.

Many studies have shown the direct impact that perceived usefulness and other related variables have on actual usage, but they ignore the attitude toward usage and the intention to use (e.g., Adam et al. 1992; Gefen and Straub 1997). Findings about the attitude toward usage and the behavioral intention to use are important because they determine customers' feelings (or emotional preferences) toward the service, as well as their commitment to use this service. Many researchers argue that simple repurchase behavior is a poor measure of true loyalty, which should include attitudes and intentions (e.g., Bloemer et al 1998; de Ruyter et al 1998).

This study applies the correlation paths predicted by prior TAM research to hypothesize the electronic service acceptance. As in past TAM studies, the first underlying relationship is that ease of use will have a positive impact on the user's attitude toward usage (Davis et al. 1989; Hsu and Chiu 2004; Chau 1996, Bhattacherjee 2000). Prior research has also found that perceived usefulness of electronic service can enhance attitude toward usage (Bhattacherjee 2000; Hsu and Chiu 2004). In addition, trust is an important factor that determines the attitude toward electronic service usage (Mcknight and Chervany 2001-2002; Suh and Han 2002). Thus, the next three hypotheses are added to the research model:

H6: The higher the level of ease of use, the more positive the attitude toward electronic service usage.

H7: The higher the level of perceived usefulness, the more positive the attitude toward electronic service usage.

H8: The higher the level of trust, the more positive the attitude toward electronic service usage.

Furthermore, trust has a major impact on behavioral intention to use electronic services (Gefen et al. 2003). Prior studies provide evidence that perceived usefulness and attitudes toward usage have a significant impact on behavioral intention to use electronic commerce services (Bhattacherjee 2000). Positive attitude is expected to increase intention to the adoption of electronic commerce (Javenpaa and Tractinsky 1999; Pavlou 2003). Therefore, the following hypotheses are proposed:

H9: The higher the level of trust, the greater the level of behavioral intention to use the electronic service.

H10: The higher the level of perceived usefulness, the greater the behavioral intention to use the electronic service.

H11: The more positive the attitude toward usage, the greater the behavioral intention to use the electronic service.

The last hypothesis is concerned with the impact of intention to use on actual usage of the Internet securities trading system. It is well established that behavioral intention to use is a dominant predictor of actual usage (e.g., Lederer et al. 2000; Suh and Han 2002). This research is to demonstrate that the somewhat more sophisticated view of consumer decision-making and behavior intention, well established in the literature, does apply in the context of adoption of Internet trading. Thus, behavioral intention is another belief that has an influence on actual usage.

H12: The more positive the behavioral intention to use, the greater the actual usage of the electronic service.

RESEARCH METHODOLOGY

A survey research approach is used to measure the constructs in the proposed model. The items were measured using a Likert scale ranging from 1="strongly disagree" to 5="strongly agree". A small-sample pretest among securities investors was conducted with 30 investors to check the reliability of the items before going ahead with the main study. Respondents were selected using judgment sampling, selected from securities investors identified as active traders by securities brokers of The Stock Exchange of Thailand during the first quarter of 2005. The data were collected with the cooperation of managers from brokerage firms who assisted by sending e-mail to their Internet user investors about the study and encouraging them to respond.

A total of 500 questionnaires were distributed. Consequently, 208 usable questionnaires of Internet trading users, and 234 questionnaires of non-Internet trading users were collected, for a total number of respondents at 442 or an 88.4 percent response rate (Table I). About 53 percent of the respondents are Internet trading users and about 47 percent are non-users. The respondents consist of more men than women. The survey results do not strongly represent the senior population, with about 40% of the respondents being in the age category of 30 and below, 38% in the age category of 31 to 40, and another 22% above 40 years. Nearly all respondents (around 95%) had university education, and about 42% held a graduate degree.

DATA ANALYSIS

Exploratory factor analysis shows that the twenty three questionnaire items representing determinants of perceived usefulness in our model are grouped into five factors (Table II). The five identified factors explained 66 percent of the total variance. All items loaded on the correct factor as intended, except one item, "the ISTS can be downloaded easily." This was originally thought to be part of the concept about perceived ease of use, but it loaded with the accessibility items, and is, in fact, consistent with accessibility. Thus, the factors were labeled information quality, trust, ease of use, flow-control, and accessibility, as in the original conceptual discussion.

Characteristics	N	%
Internet securities trading		
Users	208	47.1
Non-users	234	52.9
Age		
< 25	56	12.7
25-30	123	27.9
31-40	167	37.9
41-50	70	15.9
51-60	21	4.8
> 60	4	.9
Gender		
Male	264	61.8
Female	163	38.2
Education		
Less than bachelor	20	4.6
Bachelor	235	53.7
Graduate	168	38.4
PhD	15	3.4

Table I: Respondents' profile

The first factor, information quality, had strong loadings for all of the six items related to the information quality benefit. This factor covers the aspects of providing analysis data and company information to investors, which is thorough, relevant, accurate and up-to-date. The second factor, trust, deals with investors' trust in the system's security and reliability, and in the service provider's honesty and ability to manage the system. The third factor represents ease of use, measuring the ease of using, measuring the ease of using, searching, its understandability and readability, and navigating the Internet securities trading system. The fourth factor, named flow-control, consists of the investors' feelings of freedom and enjoyment due to the increased control and attention they have on the trading activity. The last factor, accessibility, deals with the benefits of the ability to assess the system at any time and any location, and load the system easily. As noted, the literature has talked about this item as part of ease of use, but previous studies have not used it simultaneously with items representing the accessibility concept. Here, respondents felt that the ability to load the system easily is an accessibility issue, rather than about ease of use.

The complete set of factor scores for each respondent served as covariate inputs to further Univariate Analysis of Covariance analysis (ANCOVA). Although both independent and dependent variables in our analyses are metric, we also wanted to include the user – non-user dichotomy, which was entered as a factor. The ANCOVA results are equivalent to using regression with user – non-user as a dummy variable, but programming all the interactions into a regression is tedious. ANCOVA is simply a more convenient mechanism for examining a dichotomous independent variable interacting with the metric dependent and independent variables. The user – non-user dichotomy was included because specific to this context, not all investors use the Internet securities trading services. Experience with the system may influence perceptions, so prior perceptions before adoption might differ. Thus, it is useful to briefly examine whether users and non-users have any substantial difference in perceptions.

Table II: Dimensions of the antecedents of ease of use, usefulness, and trust items

Items	Factor loadings					Communalities
	F1	F2	F3	F4	F5	
Factor 1: Information quality						
detail_information	.784	.187	.212	.194	.074	.738
trade decision_information	.730	.169	.213	.129	.165	.650
relevant_information	.691	.050	.156	.272	.062	.582
accurate_information	.676	.344	.154	.136	.125	.632
up-to-date_information	.665	.237	.202	.117	.251	.615
company_data_analysis	.639	.176	.277	.031	.234	.571
Factor 2: Trust						
trust_security	.180	.804	.119	.120	.082	.714
trust_privacy	.200	.779	.083	.256	.037	.721
trust_reliable	.157	.755	.192	-.017	.015	.631
trust_ability_to_solve	.057	.704	.213	-.041	.298	.635
trust_ability_to_manage	.279	.644	.260	.191	.144	.618
trust_honest	.228	.586	.109	.391	.041	.649
Factor 3: Ease of use						
easy_to_understand	.155	.240	.808	.156	.048	.762
easy_to_use	.170	.170	.753	.267	.091	.705
easy_to_read	.235	.216	.751	.099	.050	.678
easy_to_search	.389	.059	.579	.163	.231	.570
easy_to_navigate	.333	.170	.565	.129	.233	.530
Factor 4: Flow-control						
Enjoyable	.144	.155	.215	.773	.132	.705
Attention	.175	.156	.229	.769	.106	.710
Freedom	.259	.057	.114	.693	.341	.680
Factor 5: Accessibility						
anyplace	.143	.099	.094	.272	.800	.753
anytime	.296	.146	.124	.239	.748	.741
load_easily	.333	.236	.377	-.026	.525	.585
Cumulative variance	16.818	32.693	46.413	57.152	65.99	
Cronbach's Alpha	.874	.872	.851	.806	.746	

The impact on perceived usefulness consists of five hypotheses which were tested in the first ANCOVA. These hypotheses are related to the impact of ease of use (H1), information quality (H2), accessibility (H3), flow-control (H4), and trust (H5) on perceived usefulness. The user – non-user dichotomous variable was entered as a factor to assess both direct effects and any interaction with the main variables. All the dimensions were significant: ease of use, information quality, accessibility, flow-control, as well as trust. Flow-control showed strongest positive effect on perceived usefulness, whereas ease of use indicated the lowest, but still positive impact (Table III). The impact of the user type on perceived usefulness is not significant. In addition, none of the two-way interactions between the five independent factors are significant. This implies that users and non-users do not perceive things differently in terms of usefulness; i.e., there is little need for specific additional information to educate the non-users beyond what users are familiar with.

Source	Beta	Std. Error	F	Sig.
Corrected Model			31.542	.000**
Intercept	.050	.057	.872	.384
Information quality	.165	.056	2.951	.003**
Flow control	.462	.055	8.345	.000**
Accessibility	.172	.051	3.389	.001**
Trust	.180	.053	3.406	.001**
Ease of use	.098	.061	1.620	.006**
[Non-user type]	-.080	.079	-1.078	.282
[User type]	0	.	.	.
[Non-user type] * Information quality	.136	.077	1.778	.076
[User type] * Information quality	0	.	.	.
[Non-user type] * Flow control	.044	.076	.588	.557
[User type] * Flow control	0	.	.	.
[Non-user type] * Accessibility	.030	.075	.409	.683
[User type] * Accessibility	0	.	.	.
[Non-user type] * Trust	.059	.075	.789	.431
[User type] * Trust	0	.	.	.
[Non-user type] * Ease of use	.037	.083	.450	.653
[User type] * Ease of use	0	.	.	.

$R^2 = 0.457$, Adjusted $R^2 = 0.443$

Table III: ANCOVA for the effects on perceived usefulness

Next the impact of ease of use, perceived usefulness, and trust on attitude toward usage were tested to determine if hypotheses H6, H7, and H8 would be supported. As hypothesized, the strength of perceived usefulness, trust, and ease of use each have a positive impact, raising attitude toward usage (Table IV). It can be inferred that strong perception of usefulness is really a requirement to enhance a better attitude toward usage, as this shows the strongest impact. The results showed that non-user customers have somewhat less favorable prior attitudes toward the electronic service than user investors (coefficient of non-users relative to users = - 0.162, p = .023). The two-way interaction between ease of use and user-type is also significant. Non-user investors showed weaker relationship between ease of use and attitude toward usage of the Internet securities trading system. Their lack of actual experience seems to makes it hard for them to connect their views about ease of use into an attitude toward usage.

Source	Beta	Std. Error	F	Sig.
Corrected Model			69.334	.000**
Intercept	.076	.052	1.461	.145
Ease of use	.184	.054	3.419	.001**
Perceived usefulness	.504	.056	9.007	.000**
Trust	.105	.048	2.176	.030**
[Non-user type]	-.162	.071	-2.278	.023**
[User type]	0	.	.	.
[Non-user type] * Ease of use	-.169	.075	-2.263	.024**
[User type]* Ease of use	0	.	.	.
[Non-user type] * Perceived usefulness	.192	.073	2.640	.079
[User type] * Perceived usefulness	0	.	.	.
[Non-user type] * Trust	.060	.070	.865	.387
[User type] * Trust	0	.	.	.

$R^2 = 0.540$, Adjusted $R^2 = 0.532$

Table IV: ANCOVA for the effects on attitude toward usage

The last analysis was conducted to determine the effect of perceived usefulness, trust, and attitude toward usage on behavioral intentions, to test the next three hypotheses (H9, H10 and H11). The test results support all hypotheses (Table V). The effect of trust on behavioral usage intention, although significant, is less strong than the impact of perceived usefulness and attitude toward usage. Perceived usefulness has an impact on intention to use both directly

and indirectly through attitude toward usage. However, perceived usefulness has the greater impact on attitude toward usage than intention to use (Table IV and Table V). Not surprisingly, the results also showed that non-user investors have lower intention to use than user investors (coefficient of non-users relative to users = -0.299). The two-way interaction between user type and trust is also significant, with non-users failing to show the positive impact of trust on intention to use (i.e., the coefficient on non-users relative to users is negative.). This may indicate that with little actual experience, non-user investors have no basis for translating their trust or lack of trust into a more concrete intention to use.

Source	Beta	Std. Error	F	Sig.
Corrected Model				.000**
Intercept	.196	.041	4.777	.093
Trust	.014	.040	.347	.003**
Perceived usefulness	.321	.053	6.046	.000**
Attitude toward usage	.491	.058	8.508	.000**
Non-user type	-.299	.056	-5.358	.000**
User type	0	.	.	
[Non-user type] * Trust	-.143	.058	2.484	.013**
[User type] * Trust	0	.	.	
[Non-user type] * Perceived usefulness	-.138	.075	-1.844	.066
[User type] * Perceived usefulness	0	.	.	
[Non-user type] * Attitude toward usage	.064	.079	.819	.414
[User type] * Attitude toward usage	0	.	.	.

$R^2 = 0.693$, Adjusted $R^2 = 0.687$

Table V: ANCOVA for the effects on intention to use

The last hypothesis (H11) was concerned with the impact of intention to use on actual usage of the Internet securities trading system. The dependent variable was measured in hours per week of respondents' service usage. The direct impact of user types on actual usage is significant (Table VI). The result showed that non-user investors' usage is lower than user investors (coefficient of non-users relative to users = -11.267). In addition, the two-way interaction between user type and the intention to use relationships is significant. The coefficient indicates that among user investors, stronger intention has a greater impact on actual usage than among non-user customers. This may be a further indication that non-user investors who have not adopted the Internet securities trading system tend to have a lower intention to use this service and may rely on other channels, especially on the interpersonal service.

Source	Beta	Std. Error	F	Sig.
Corrected Model			100.114	.000
Intercept	11.267	.545	20.670	.000
Non-user type	-11.267	.723	-15.591	.000**
User type	0			
Intention to use	1.470	.575	2.557	.011**
[Non-user type] * INTENT	-1.470	.731	-2.012	.045**
[User type] * INTENT	0	.	.	.

$R^2 = .420$, Adjusted $R^2 = .416$

Table VI: ANCOVA for the effects on actual usage

CONCLUSION AND IMPLICATIONS

This study supports the idea of adapting the Technology Acceptance Model to the investigation of Internet services. The results identified five factors (ease of use, information quality, flow-control, accessibility, and trust) that are shown to be reliable measures for characterizing perceived usefulness. Of these five, flow-control has the greatest impact on predicting usefulness. The result is consistent with Horton et al. (2001) who showed that web self-service can influence consumers' behavior and provide concentrated experience which has an impact on intention to return. The result also implies that some investors are more independent, making risky financial transactions by themselves without following others' advice. On the other hand, accessibility has the weakest influence on perceived usefulness.

A possible reason for this result could be the low speed of the Internet securities trading system and computer network infrastructure. Specific to this context, the fast movement of securities prices is crucial to achieving a gain or loss for investors; this makes investors very demanding when it comes to the system's accessibility, and without top systems, accessibility may not translate very strongly into perceived usefulness.

In addition, trust plays an important role in increasing perceived usefulness. The perceived usefulness of Internet securities trading does have a positive impact on attitude toward usage. Perceived usefulness was linked to attitude toward usage more strongly than ease of use and trust. Non-user investors apparently felt some barriers to adopting the system and had a less favorable attitude toward usage than user investors. Also as theorized, attitude toward usage, trust, and perceived usefulness were significantly correlated with intention to use. Attitude toward usage was linked to intention to use more strongly than to perceived usefulness.

A major difference in this model, compared with other TAM research (such as Gefen et al. 2003), is the impact of trust. Trust shows only a marginal impact on intention to use. Trust is more appropriate in predicting perceived usefulness and attitude toward usage than intention to use. It is likely that trust is a more valuable concept in explaining the psychological attitudes toward the service, rather than as a direct predictor of intention to use. Such results also show the utility of examining user decision process in a more sophisticated manner than simply linking everything to usage.

This research indicates that current users feel the Internet securities trading system is a good channel to interact with the brokerage firms more efficiently. Moreover, if it is well integrated into the overall business, the web channel can enable brokerage firms to provide more responsive service, and higher acceptance. Customers do not seem to see the web as a useful channel to replace traditional services, but rather as a way to supplement and enhance the flexibility for securities trading (e.g., Srijumpa et al 2002), which is similar to the case in banking (e.g., Rotchanakitumnuai and Speece 2003, 2004). Hence, brokerage firms should offer web-based services as a strategic element to improve customer service and long-term profits, but they cannot do this by trying to shift customers to the web as an alternative to the interpersonal relations. Special treatment and social benefits are important for the typical customer in Thai service industries. This kind of personalized treatment would be difficult if customer interaction is limited to the Internet.

Flow-control by customers provides the possibility to increase perceptions of usefulness by investors. Securities trading customers tend to prefer the interaction with a self-service system. Brokerage firms should add something to the core services that investors perceive as important, beneficial, and unique. Further, good experience with the service can increase willingness to use (Johnson and Mathews, 1997). Brokerage firms can also add valuable benefits for the customer by increasing the system's ease of use. For instance, brokerage firms must focus on the friendliness of the websites (e.g. clarity, consistency, navigation, and visual presentation on the web pages).

Non-user investors have a lower intention to use and less trust in the Internet securities trading systems, but for the most part, the way perceptions of these various concepts translate into perceived usefulness, attitudes, intention to use. These results have important implications because they indicate that continued efforts to build strong perceptions about ease of use, information quality, accessibility, and flow control will eventually reduce resistance to adoption. However, while the web channel does enhance benefits, it is probably not be the only factor in building acceptance of usage among non-users. Apparently, other channels, usually interpersonal interactions with the brokerage firms, remain important, especially for building trust. The study results here indicate that electronic service providers should take careful steps to communicate with prospective investors about their concerns to increase the integrity, reliability, and their ability to manage the system more efficiently in order to entice them to make online transactions.

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