

[ **ABSTRACT** ]

**P**ERCEIVED risk is one of the major factors influencing electronic service adoption. This paper addresses the issues related to the perceived risk of e-government services in the context of Internet-based tax filing, so called e-revenue. The empirical survey-based study of personal income tax payers shows that there are three risk facets connected to e-revenue adoption: perceived performance risk, perceived privacy risk, and perceived unfair financial audit risk. Perceived performance risks and financial audit risks are more crucial than others in discriminating e-revenue users from non-users. The perceived privacy risk is not the key element in determining adoption. Implications of these findings with regards to electronic service practice are discussed.

**Keywords:** Perceived risk, e-government, e-revenue

# E-government service: The perceived risk facets of e-revenue systems



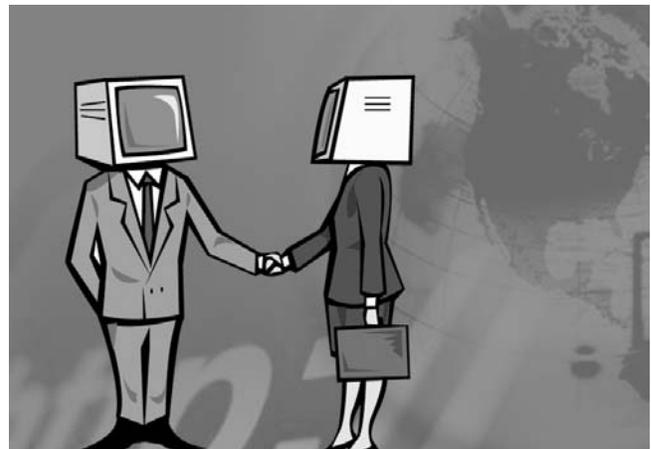
## Introduction

THE Internet and the web have a great impact on business and society, particularly in the business-to-business and business-to-consumer context. In the digital technologies and knowledge society environment, many government agencies have realized the importance of using the web channel to provide a better service to businesses and citizens by reducing operation costs (e.g. Chan and Al-Hawamdeh, 2002; Shackleton et al. 2006; Choudrie et al. 2005). The Thai government has initiated the electronic government (e-government) master plan to develop the Internet technology infrastructure and to encourage businesses and citizens to use the web channel to interact with the government agencies. One of the success cases of implementing e-government service is the Internet tax payment system - so called e-revenue - implemented by the Revenue Department. This system gives a good impulse to the enhancement of Internet-based tax payment service usage in Thailand. There seems to be substantial acceptance in e-revenue service, more than half of the citizens pay their personal income tax via the Internet channel. However, whilst there seems to be tremendous growth in e-service acceptance, it is often in conflict with perceived risks of adopting the e-revenue system. Some citizens have shown unwillingness to complete tax payment via the Internet channel, primarily due to risk concerns (Pavlou, 2001). Relatively little research has addressed the issue of perceived risks related to e-government adoption. Prior studies frequently focus on the general aspects of e-government, e.g. the impact of e-government initiatives (Chan and Al-Hawamdeh, 2002), quality performance (Hazlett and Hill, 2003), the e-government evolution and maturity model (Shackleton et al. 2006). There is little published work on perceived risks about adopting e-government services, especially in the context of developing countries in the Asian region. This research, therefore, aims to develop the perceived risks framework for e-government services in the context of the Internet tax payment system, or e-revenue for personal income tax filing. This paper seeks to present empirical insight into the following two research questions:

- What types of risks are prominent to e-government service?
- What types of risks have substantial impact on e-government service adoption?

## Theoretical framework

PERCEIVED risk has been an interesting research topic in many fields. In marketing literature, risk arises from unanticipated and uncertain consequences resulting from using a product or a service, generally causing an unpleasant feeling. Cox and Rich (1964) classified two categories of perceived risk: performance and psychological risk. Jacoby and Kaplan (1972) identified multiple types of risks, including financial, psychological, performance, physical, and social risk. Financial risk is defined as the potential loss of benefit or money because a product or service does not satisfy the customer's expectation. Psychological risk perception is defined as the experience of anxiety or negative effects arising from the selection of a wrong service or product. Performance risk is the possibility that a product or service will not work as expected by the customer. Physical risk is defined as the danger of harm or injury to the customers or others while using a product or service. Social risk is the potential change of status in one's social group as the result of adopting a product or service. According to past studies about consumer behavior, when customers perceive higher risk, the less likely they will adopt a service or purchase a product (Dowling and Staelin, 1994).





In the electronic commerce environment, studies indicated that perceived risk is a main barrier towards adoption (Bahli and Benslimane, 2004; Featherman and Pavlou, 2002; Lim, 2003). Featherman and Pavlou (2002) found five indicators of electronic service risk: psychological, financial, privacy, performance, and time risk. Bahli and Benslimane (2004) identified six levels of risks for wireless computing including risks associated with users, mobile devices, wireless networks, wireless applications, the Internet and corporate gateways.

Specific to electronic service systems, the two prominent risks having a significant impact on electronic government service adoption are security and reliability of the system (Kesh et al. 2002; Rotchanakitumnuai, 2003; Rotchanakitumnuai and Speece, 2004; Ranasingham, 1999). This technology performance issue is the customer's perceived risk related to how well the system can perform efficiently (Featherman and Pavlou, 2002; Grewal et al. 1994; Rose et al. 1999). In addition, Internet customers also perceive financial risk due to credit card fraud. In relation to this case, the in-depth interview results, main part of the qualitative work, indicate that Thai citizens are particularly concerned about the audit and financial risk of using the e-revenue system. The reason is that after a tax payment via the Internet they may be audited and requested for additional financial documents proving the transaction. The Thai government tries to motivate citizens to utilize e-revenue by applying the policy of faster tax refund to

income tax payers using the Internet-based system. Many taxpayers do not adopt the electronic service because they have to keep all the income documents for five years in case the Revenue Department requests further audits in the future. They feel uncertainty of the fair audit risk and legal support for filing tax via the Internet. In addition, e-revenue adoption is linked to privacy risk. This is the possibility that the authorities collect data about taxpayers and may use or disclose it inappropriately (Lam, 2005). The qualitative research about e-government adoption did not reveal any incurring social dangers or time-loss risks. This implies that taxpayers normally do not lose time by using the e-revenue website and do not show any behavior that is not accepted by other users. Thus, adoption of e-government services can be inhibited by following risk issues: performance risk, fair financial audit risk, and privacy risk. If the perceived risk elements can be solved and lowered, citizens may be more likely to adopt an Internet tax payment system. Featherman and Pavlou (2002) found the negative relationship between perceived risk and intention to adopt electronic service. Hence, the hypotheses for this study are:

**H1:** The higher perception of performance risk adversely affects e-revenue service adoption.

**H2:** The higher perception of financial audit risk adversely affects e-revenue service adoption.

**H3:** The higher perception of privacy risk adversely affects e-revenue service adoption.

## Research methodology

THE literature review was one source upon which question naire items were based. The qualitative work with in-depth interviews was the other source in order to explore how existing concepts are conceptualized from the viewpoints of Thai e-government service potential users. 15 users and 15 non-users of e-revenue services have been interviewed. The items covered the three issues of e-government service risks discussed above: performance risk, fair financial audit risk, and privacy risk. The questionnaire items are measured by a Likert’s scale ranging from 1 to 5 (1=“strongly disagree”, 5=“strongly agree”). A small-sample pretest was conducted among personal income tax payers to check the reliability of the questionnaire. Sample respondents were selected by judgment sampling to cover a range of professions, income, and age. In addition to judgment sampling, the snowball sample method has been applied in order to collect data from a variety of professions. A total of 1,004 completed survey questionnaires have been received: 710 current users and 294 non-users. The demographics of all respondents are shown in Table I. The survey results do not strongly represent the senior population, with about 25 % of the respondents being in the age category of 30 and below, 39% in the age category of 31 to 40, and another 28% above 40 years. 94.3 percent of the respondents had university education.

## Result

WITH descriptive data analysis, the means of the items “keeping tax income documents” and “rivity of information” are not particularly impressive with the highest scores at 3.58 and 3.39 (Table II). Agreement to financial risks, the possibility that respondents will be asked for additional tax payments, was not quite high. Respondents rated this item at 2.75, indicating that they may not yet see great financial risk in adopting e-revenue. In the qualitative work, one reason might be

Table I: Respondent Profile

Characteristics	N	Percent*
<b>Type</b>		
Current Users	710	70.7
Non-users	294	29.3
<b>Gender</b>		
Male	538	54.1
Female	457	45.9
<b>Age</b>		
<25	34	3.4
25-30	220	22.0
31-40	391	39.1
41-50	276	27.6
51-60	65	6.5
>60	14	1.4
<b>Education</b>		
Less than bachelor	57	5.7
Bachelor	568	57.1
Graduate	325	32.7
PhD or higher	45	4.5

Note: \*Valid percents are presented because of occasional missing data.

that the majority of e-revenue users ask for tax refund from the Revenue Department, which they expect to get faster payment as this is one incentive that government encourages citizen to use the e-revenue system.

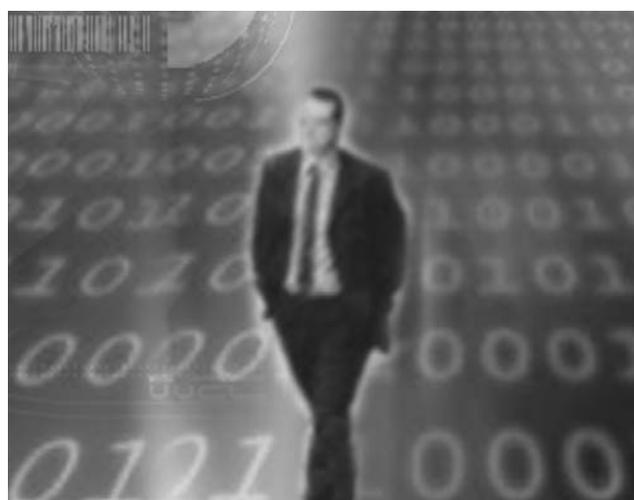


Table II: Descriptive data and factor analysis

Characteristics	Mean	SD.	Factor Loading
<b>Factor 1: Privacy risk (Cronbach Alpha = .807)</b>			
Using E-Revenue makes me worry that my personal data may be used for other purposes.	3.39	1.23	.848
Using E-Revenue makes me worry about the privacy of my Information.	3.11	1.24	.814
Using E-Revenue makes worry that I have to keep all my income documents for 5 years as the Department of Revenue may request for future audit.	3.58	1.30	.652
<b>Factor 2: Performance risk (Cronbach Alpha=.824)</b>			
Using E-Revenue makes me worry because I cannot save the tax filing information.	3.03	1.32	.867
Using E-Revenue makes me unsure whether the tax filing has been submitted successfully.	3.05	1.33	.840
Using E-Revenue makes me worry that my data may be hacked.	3.08	1.25	.708
<b>Factor 3: Fair financial audit risk (Cronbach Alpha=.822)</b>			
Using E-Revenue makes me have worry that I will be asked for additional tax payment.	2.75	1.29	.859
Using E-Revenue makes me worry about being audited easily.	2.89	1.32	.833
Using E-Revenue makes me worry about fair legal support to e-revenue users.	3.03	1.24	.639
<b>Cumulative variance</b>			74.79%

Factor analysis was carried out to explore the dimensions of perceived risk. The results showed that the perceived risk items were grouped into three factors, which correspond well with the three facets discussed in the literature, and with the questionnaire developed from the qualitative survey results. The three factors identified explained 74.79 percent of the total

variance (Table II). According to the items loaded on each factor, the first factor was labeled as privacy risk. It had strong loadings for all three of the items relating to taxpayers' perceptions towards e-government services. This factor includes the risk of misuse of taxpayers' data for other purposes, of information privacy, and of keeping income tax documents for 5 years.

The second factor, performance risk, deals with the reliability of the system, the lack of ability to save the tax payment filing via the Internet, and the system being hacked. The last factor - named fair financial audit risk - consists of the following items: additional tax payment, post audit for additional tax payment, and fair legal support for e-revenue system.



**Table III:** Logistic regression model for e-revenue adoption

Variable	B	S.E.	Wald	Sig.
Privacy risk	-.071	.094	.569	.451
Performance risk	-.562	.097	33.467	.000
Fair financial audit risk	-.356	.094	14.442	.000
-2 log likelihood for model with constant only = 756.858				
-2 log likelihood for full model = 705.955				
Chi-square = 50.902 df 3 Sig .000				

Classification accuracy = 72%

Further, logistic regression analysis was conducted to distinguish e-revenue users from non-users. User types were measured as the dependent variable, and the three perceived risk factor scores as the independent variables. The chi-square test for the full model was significant (at  $p = 0.000$ ). The - 2LL improvement gained by adding the full model variables suggest that the model is useful (Table III). The two significant variables in the model were the perceived performance risk and the fair financial audit risk factors (H1 and H2 are supported). The performance risk factor had the largest negative impact coefficient, which is perhaps the best way to decide relative importance of e-revenue service adoption (Hair et al., 1995). The fair financial audit risk was found to be significant as a prominent risk factor for e-revenue service adoption. The results showed that the privacy risk is not useful in predicting adoption nor has any impact on adoption; i.e. respondents do not seem to view privacy risk as a barrier to adoption (H3 is rejected). The classification performance of the full model and was able to correctly predict users and non-users of e-revenue about 72

percent of original grouped cases were correctly classified, which means that only 28 percent of the total cases are not correctly classified, and mixed with groups to which they did not originally belong.

### Implication and Conclusion

**P**RIOR consumer and information technology research has mentioned the importance of perceived risk as an inhibitor to electronic service adoption. The e-revenue context was selected as the study case of electronic government service adoption. According to the result, the authors found three components of perceived risks: privacy risk, performance risk and fair financial audit risk. For this sample the performance risk and the fair financial audit risk are essential in predicting adoption. To overcome the performance risk of e-service systems, the government agencies must establish high system reliability and capability. In the case of personal income tax payment, too many times the systems cannot be accessed during peak periods. It is



important to upgrade the systems' capacity and security infrastructure, especially for the website. An important underlying issue is the fact that citizens normally have a pessimistic perception of the Revenue Department, compromising positive interaction and a constructive relationship. This brings to the issues of lack of fair financial audit. Hence, to reduce the risk associated with fair financial audit, the e-government service provider needs to apply a clear and fair policy, and a reasonable selection of taxpayers for post tax payment audit.

The implications for e-government service agencies are twofold: first, the use of perceived risk analysis in the checklist for e-government project planning and evaluation. Indeed, government agencies should communicate with citizens with reasonable and fair policies, guarantee safety, technological reliability and service quality in order to inspire trust in electronic service and retain current users to employ e-government service. Second, while the Internet channel does contribute to provide better service to citizens, it is not the main factor in building the acceptance. In this early stage of e-government service implementation, interpersonal service and citizen support, such as call centers, is still needed when problems are faced. This is consistent with the discussion in Rotchanakitumnuai (2006), who advises that customer-service provider relationships cannot be

ignored when implementing electronic service. E-government service providers have to work on other relationship elements simultaneously to develop ways to explicitly get citizens to perceive high switching costs from the e-government service. For example, good service quality with a range of supporting services through many channels increases benefits for the customer (e.g., after-transaction e-mail or message back to mobile phone). This would reduce the likelihood that e-revenue tax payers would change to a traditional face-to-face service. E-government service providers need to be more market driven in their innovation to respond to perceived citizen needs and wants, rather than technology driven to just implement new technology service delivery to their citizens. One of the limitations of the research is that it focused on the personal income tax payers. Moreover, it is too early to judge whether the perceived risk analysis results can be applied to other electronic service contexts. Future research can expand to other group of respondents such as corporate taxpayers or examine perceived risks associated with the e-service quality and trust concepts.

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