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Chat Chuchuen* and Sirikul Tulasombat

Faculty of Business Administration, Maejo University

Chiang Mai Thailand 50290

Ritsumeikan Center for Asia Pacific Studies (RCAPS)
Ritsumeikan Asia Pacific University (APU)
URL: http://www.apu.ac.jp/rcaps/

The Adoption of Information System for Organic Agricultural Small and Medium Enterprises (SMEs) in Chiang Mai

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Faculty of Business Administration, Maejo University

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Abstract

The adoption of Information system in worldwide organizations has been dramatically increased every year. There have been various factors making IS adoption process successful, especially, for small and medium enterprises (SMEs) which have applied different techniques than those of more-complex-structured firms. Thai government has set up plan to ensure the sustainable growth of small, medium, and start-up enterprises realizing that the robust growth of SMEs and start-up firms will reflect to economics sustainability. This study demonstrates factors affecting the adoption of information system process in Thai organic SMEs in Chiang Mai by utilizing technology acceptant model (TAM) and theory of reasoned action (TRA), i.e., ease of use (EOU), usefulness, user attitude, and social normative. Hence, the objective of this study is to examine the relationship among TAM factors, user attitude, and social normative, intention to adoption and user satisfaction. It is found that the factor of subjective norm and the factor of attitude toward behavior (Attitude) are the two factors that can be used for the prediction of intention to use Information System (IS) among the Organic Agricultural SMEs in Chiang Mai. Moreover, the factor of intention to adopt Information System (IS) among the agricultural SMEs can be brought to use in the prediction for the satisfaction in the use of Information System (IS). The research contribution can be used to improve understanding in information system adoption process. Finally, the result will assist SMEs in the adopting of information system in their organization efficiently.

Keywords : Information System, TRA, TAM, Attitude, Social Normative

*Corresponding author e-mail : chat@office365.mju.ac.th

1. Introduction

Information Technology (IT) continues to be rapidly developed as the years go by. This leads the business operation process to keep adapting with the high competitive environment, especially to adopt the Information and Information System (IS) as the alternatives tools to generate advantage for the businesses (Taylor& Todd, 1995). In Thailand, SMEs are a major driven of the national economic growth. The issued questioning is how to sustainably create the competitive advantages for Thailand SMEs. Most of the small and medium enterprises (SME) are focusing on other aspects in the operation process for example manufacturing process, marketing, distribution, etc. Hence, the adoption of Information System (IS) is a factor that can form better efficiency in any operation processes and more sustainability growth for Thai SMEs (Allart, 2015; Chanvarasuth, 2010) . However, the process of Information System (IS) adoption involves with so many factors for example Infrastructure, employees' knowledge, firm budget, management vision, etc. Moreover, the awareness in Information System (IS) adoption is a very important issue which is discussed in many firms especially in SMEs context (Changchit & Chuchuen, 2016; Yousafzai et.al, 2010).

This study demonstrates the factors affecting the adoption of Information System (IS) process of Thai Organic Agricultural SMEs in Chiang Mai by utilizing technology acceptant model (TAM) and theory of reasoned action (TRA), i.e., ease of use (EOU), usefulness, user attitude, and social normative. Hence, there are many limitations in the innovation adoption process. This study will explore in this following questions;

1. What is the current situation of IS adoption process in Thai Organic Agricultural SMEs in Chiang Mai?
2. What are the affecting factors in IS adoption for Thai Organic Agricultural SMEs in Chiang Mai?

2. Literature Review

2.1. Small and Medium Enterprise (SMEs)

SMEs are the smallest business unit which is very important for economic system in many countries, especially in the developing countries (Chanvarasuth, 2010). In Thailand, Thai

government has many policies to promote and support Thai SMEs. Due to Thailand is an agriculture country, the Organic Agricultural SMEs are the big group for Thai SMEs. Although, there are quite various of different factors for Organic Agricultural SMEs from other firms. Thus, there are problems and barriers associated with the implementation, especially, in the area of integrating marketing, production, and organization management (Allart, 2015).

2.2. Theory of Reasoned Action (TRA) and Technology Acceptance Model (TAM)

2.2.1 Theory of Reasoned Action (TRA)

Among the three original psychological models, the theory of reasoned action (TRA) is the one that was developed according to the theory of attitude by Martin Fishbein and Icek Ajzen (1967). The aim of this theory was to describe the human actions relationship between attitudes and behaviors. The researchers used TRA to predict the behaviors of individuals based on their pre-existing attitudes and behavioral intentions (Ajzen, 1986). The two factors were suggested by Ajzen and Fishbein (1979) to determine on the intention: attitudes and subjective norms. An attitude refers to the opinion of individual related to whether the behavior is positive or negative (Colman, 2015). A subjective norm however explained the pressure from society sensed by an individual for them to behave or not behave on the habits. Together, it was considered that attitudes and subjective norms could determine for the behavioral intention while the behavioral intention directed toward the behavioral performing (Madden et.al, 1992; Yousafzai et.al, 2010).

The theory of reasoned action enhances for individual's voluntary behavior understanding (Doswell, 2010). According to the theory of reasoned action, it was found from the concept that it had something to do with the basic motivation of a person to act on some behaviors. In reference to the theory, a certain behavior performing intention would precede the real behavior (Chuchuen, 2016; Richardson et.al, 2012). This intention is so called the behavioral intention where it resulted from the belief that the behavioral performing would direct toward the particular outcome (Shimp & Kavas, 1984). The importance of behavioral intention is that in the theory, these intentions "are considered from the attitudes to behaviors and subjective norms" (Oskamp, 1984). It is suggested from the theory of reasoned action that the stronger intentions directs toward the more effort on behavioral performance in which it also raise the probability to perform the behavior (Chuchuen, 2016; Gillmore, 2002). TRA model according to the behavioral theory can be explained as follows:

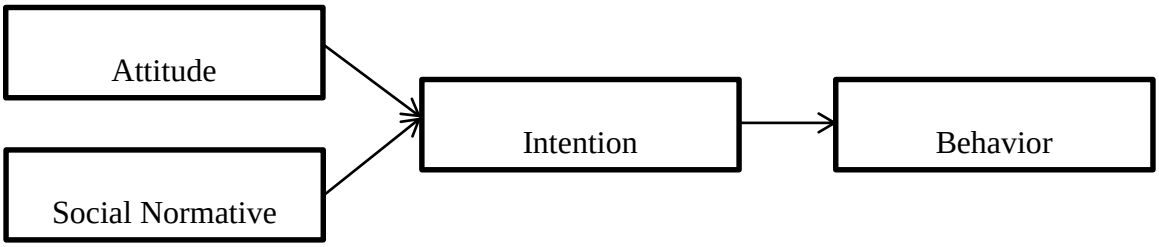

Figure 1 : The factors in Theory of Reason Action (TRA) (Ajzen, 1986)

According to the factors in the TRA model, we can be explained TRA as the following equation (Ajzen, 1986):

$$BI = (AB)\ W1 + (SN)\ W2$$

where:

BI = behavioral intention

(AB) = one's attitude toward performing the behavior

W = empirically derived weights

SN = one's subjective norm related to performing the behavior

2.2.2 Technology Acceptance Model (TAM)

The technology acceptance model (TAM) is the one of famous technology adoption theory which uses in various previous researches (Changchit & Chuchuen, 2016; Chooprayoon & Fung, 2010). The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it (Davis, 1986; Davis et.al, 1989). There are two mainly factors in TAM model as follow;

Perceived usefulness (PU) – PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance"(Davis, 1989).

Perceived ease-of-use (PEOU) – PEU is demonstrated as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989).

Since 1989, after TAM was introduced by Davis; many of researches had applied and enlarged this original TAM model as the example and expanded it in two major upgrades to become TAM 2 (Venkatesh & Davis 2000 & Venkatesh 2000) ; the Unified Theory of Acceptance and Use of Technology (or UTAUT, Venkatesh et al. 2003). Later, there was the proposed of TAM 3 in e-

commerce context by including the effects from perceived on system usage risk and trust (Venkatesh & Bala 2008).

TAM is the abbreviation of Theory of Reasoned Action (TRA) normally used in IS field. TAM posits that the perceived on ease of use and perceived usefulness can reflect the individual's intention for system adopting with the intention to serve for mediator in the actual system usage (Malhotra & Galletta, 1999). The original TAM is presented by the author in two key system determinants; the perceived usefulness (PU) and perceived ease of use (PEOU) (Davis et.al, 1989). According to this model, the attitude toward using (ATU) can directly predict the users' behavioral intention in using (BI) for the real system using determination (AU) (Fishbein & Ajzen, 1975). Various researchers had suggested that TAM was required for more variables inclusion for model strengthening (Davis, 1986; Davis et.al, 1989).

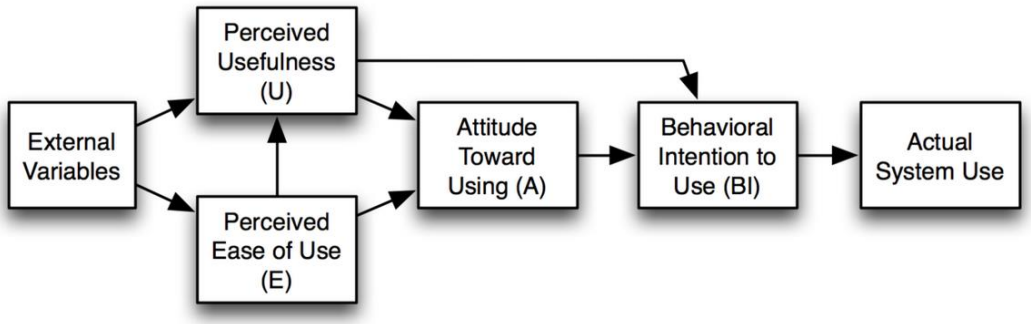

Figure 2 : The Technology Acceptance Model, version 1. (Davis et.al, 1989)

3. CONCEPTUAL MODEL AND RESEARCH HYPOTHESES

Due to the literature review, the variable from Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), should be tested among intention to use Information System and their satisfaction in using Information System adoption organic agricultural SMEs in Chiang Mai, Thailand (Malhotra & Galletta,1999). Hence, the research conceptual framework is presented as follows;

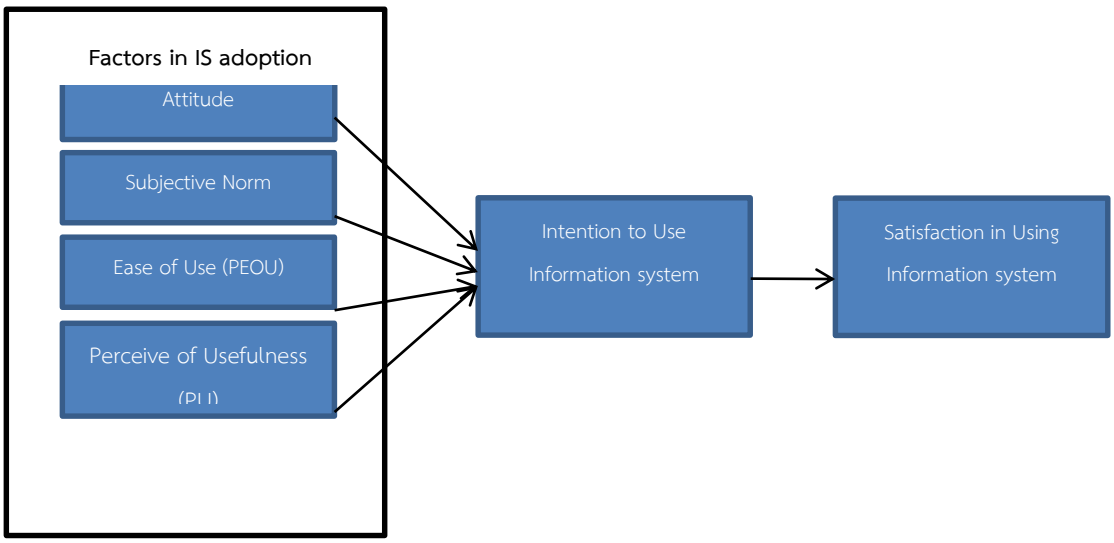

Figure 3 : Research Conceptual Framework

According to the research framework, we can propose 5 hypotheses as following;

H1: The perceived usefulness in Information System adoption will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.

H2: The perceived ease of use in Information System adoption will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.

H3: User Attitudes will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.

H4: Subjective norm will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.

H5: Intention in Information System adoption will have related to satisfaction in Information System adoption for organic agricultural SMEs in Chiang Mai.

3. RESEARCH METHODOLOGY

The questionnaire and interview are used for data collection in this study. The questionnaire consists of four parts. The first and second parts aim to collect demographic information as well as information about Information System usage and their experiences in Information technology of each SMEs. The third part contains general questions about Information System adoption which consist of perceived of usefulness, perceived ease of use, user attitude, and social normative. The last part focuses more specifically on satisfaction on IS adoption that relative with the third part. The main items used in the questionnaire are 32 likert scale items.

The respondents are the organic agricultural SMEs in Chiang Mai Province, Thailand. They have various in educational backgrounds and IT & IS usage experiences. There are 150 prospective online questionnaire respondents. Preliminary 80 prospects are not qualified (data missing and non M-payment adopter), finally 68 eligible respondents are used in analysis stage.

4. RESULTS AND CONCLUSIONS

From the distribution of demographic information of the sample, fifty-four percent are male and forty-six percent are female. Forty-one to fifty years old dominates the sample. Most of the respondents have graduated from the Bachelor degree. Most of them are the proprioritыship (69.12 percent) follow by registered ordinary partnership (16.18 percent).The major SMEs in this study have experienced on the personal computer using (61.76 percent) follow by smart phone (22.06 percent) and laptop (11.76 percent) respectively.

According to the questions in the third and the fourth section of the questionnaire, we can demonstrate the 6 factors in used namely; perceived of usefulness, perceived ease of use, user attitude, social normative, IS intention and satisfaction in IS adoption. The levels of each factors are presented in table 1:

Table 1: Level of factors in IS adoption for SMEs in Chiang Mai

Factors	$\bar{x}$	S.D.	N
1. Perceived of Usefulness *(PU)*	4.20	0.48	*68*
2. Perceived Ease of Use *(PEOU)*	3.85	0.56	68
3. User Attitude *(UA)*	4.05	0.52	68
4. Social Normative *(SN)*	4.03	0.53	68
5. Information System intention *(INT)*	4.08	0.59	68
6. satisfaction in Information System adoption *(SAT)*	4.04	0.52	68

This study also conducted the reliability test with Cronbach's Alpha of 0.913. From TABLE 2, the result of hypotheses testing by multiple regression and simple regression is presented at the

significant level of 0.05 ($P < 0.05$) found that the factors that results on the intention to use Information System (IS) the most are the factor of perceived of Information System (IS) usefulness (PU), second by the factor of attitude toward behavior and subjective norm respectively. It is also found that the factor of subjective norm and the factor of attitude toward behavior (attitude) are the two factors that can be used for the prediction of intention to use Information System (IS) among the organic agricultural SMEs in Chiang Mai at the significance of .05. On the contrary, it is found that the factor of perceived of Information System (IS) usefulness (PU) and the factor of perceived on the ease of use (PEOU) cannot bring to use for the prediction of intention to use Information System (IS) among the organic agricultural SMEs in Chiang Mai at the significance of .05. At last, the factor of intention to adopt Information System (IS) among the agricultural SMEs can be brought to use in the prediction for the satisfaction in the use of Information System (IS) among the organic agricultural SMEs in Chiang Mai at the significance of .05. Then results are presented in TABLE 2.

Table 2 : Hypotheses Testing with MRA and simple regression

Factors	Beta	t-test	*P*
1. Perceived of Usefulness *(PU)*	0.036	0.374	-
2. Perceived Ease of Use *(PEOU)*	-0.035	-0.290	-
3. User Attitude *(UA)*	0.509	4.834	***
4. Social Normative *(SN)*	0.382	3.590	***
5. Information System intention *(INT)*	0.587	5.884	***

*** $P < 0.05$ (n = 68)

According to TABLE 3, it can be concluded that perceived usefulness in Information System adoption and perceived ease of use in Information System adoption have no effect on the intention to adopt Information System among Organic Agricultural SMEs in Chiang Mai. Therefore, hypotheses 1 and 2 (H1 and H2) are rejected. But on the aspect of user attitude and social norm, they have some relationship with the intention to adopt Information System by Organic Agricultural SMEs in Chiang Mai. Thus, hypotheses 3 and 4 (H3 and H4) are accepted. Finally, we found that intention to adopt

Information System is related to the satisfaction of Information System adoption among organic agricultural SMEs in Chiang Mai as well. Then, hypothesis 5 (H5) is accepted.

TABLE 3: The Summary of Research Hypotheses Testing

Hypothesis	t-test	Result
H1: The perceived usefulness in Information System adoption will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.	*0.374*	**Rejected**
H2: The perceived ease of use in Information System adoption will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.	*-0.290*	**Rejected**
H3: User Attitudes will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.	*4.834*	**Accepted**
H4: Subjective norm will have related to an intention in Information System adoption for organic agricultural SMEs in Chiang Mai.	*3.590*	**Accepted**
H5: intention in Information System adoption will have related to satisfaction in Information System adoption for organic agricultural SMEs in Chiang Mai.	*5.884*	**Accepted**

5. DISCUSSION

According to this study, it is found that the factor of perceived of the Information System (IS) usefulness (PU) and perceived on its ease of use (PEOU) cannot be used to predict the intention to adopt the Information System (IS) among the organic agricultural SMEs. This can result from various factors such as the agricultural SMEs owners themselves and the characteristics and structures of the organic agricultural SMEs businesses that clearly differ from other businesses in general. Therefore, though how easy to use the Information System (IS) or how much benefits it can generate for the agricultural SMEs businesses, but it cannot form the vision of the owners or the organization's personnel to see that the adoption can generate the competitive advantages for them. Since the entrepreneurs in the business group pay attention to the core business functions such as production, seeking for the market channel, sales, etc.; thus, these are the reasons that the usefulness

of Information System (IS) and its ease of use may not affect on the intention to adopt the Information System (IS) among the organic agricultural SMEs businesses in Chiang Mai.

6. Future study and limitation

The opportunities for future research for this paper should consider in some variable factors that can be adopted for future studies for test the other dimensions for example trust and user awareness. The future study should be able to replicate the process in other aspect of Information system adoption such as user knowledge, function of Information system etc.

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