Determinants of Behavioral Intention to Use E-Government in Thailand: Mediating Role of Perceived Value of E-Government

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Abstract
The aim of this study was to know about the impact of social influence (SI), trust worthiness (TW), degree of openness (DO), technological risks (TR) and facilitating conditions (FC) on behavioral intention to use (BIU). This paper also aims to know the mediating role that perceived value of E-governance (PVG). This study was conducted in Thailand. Out of the total 292 respondents of this research, 112 were male and 180 respondents were females, which means that majority of the respondents were females. Out of the total 292 respondents of this research, twenty-three of the respondents had completed their graduation, one hundred and thirty-six respondents had completed their post-graduation, one hundred and twenty-three respondents had completed their masters and ten respondents had other degrees. Out of the total 292 respondents, 230 of the respondents were between the age of 21 to 30 years, 42 were in the age range of 31 to 40 years, 18 were between the age of 41 to 50 years, and lastly 2 were more than 50 years old in age. The research showed that the impact of FC and SI is positive and significant on BIU. Whereas, TR, DO and TW have insignificant impact on BIU. The study also proposed that the mediating role of PVG is significant between FC, TW, TR and BIU is significant. Whereas, the mediating role of PVG between DO, SI and BIU is insignificant.

INTRODUCTION

Technology has exploded into all the domains of everyday life and changed the way that we lead our lives in both personal and professional scope. IT has affected how companies today conduct their daily business and the way that governments interact with each other and their subsequent people (Ntulo & Otike, 2013). The governments today are recognizing that they can enhance their quality and efficiency of service by using technologies similar to ones that are being used in the fields of e-business. E-government primarily intends to create effective, efficient and innovative information systems in the domains of public sectors (Panagiotopoulos, Al-Debei, Fitzgerald, & Elliman, 2012).

The specific sectors of a country's government and public sectors play a vital role in the formation and the success of its e-governance policies. Technology

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and society, as well as the body of governmental agencies, affect perception and acceptance of e-governance by the common people as seen in figure no.1 (Shouran, Rokhman, & Priyambodo, 2019). The success of these policies requires active engagement from all the relevant stakeholders. While on one hand, the e-government initiatives have seen success in countries like the US and UAE, developing countries like Thailand have been facing many challenges regarding adoption trends (Gunawong & Gao, 2017). This failure is mainly due to the lack of a strong infrastructure of government and public sectors.
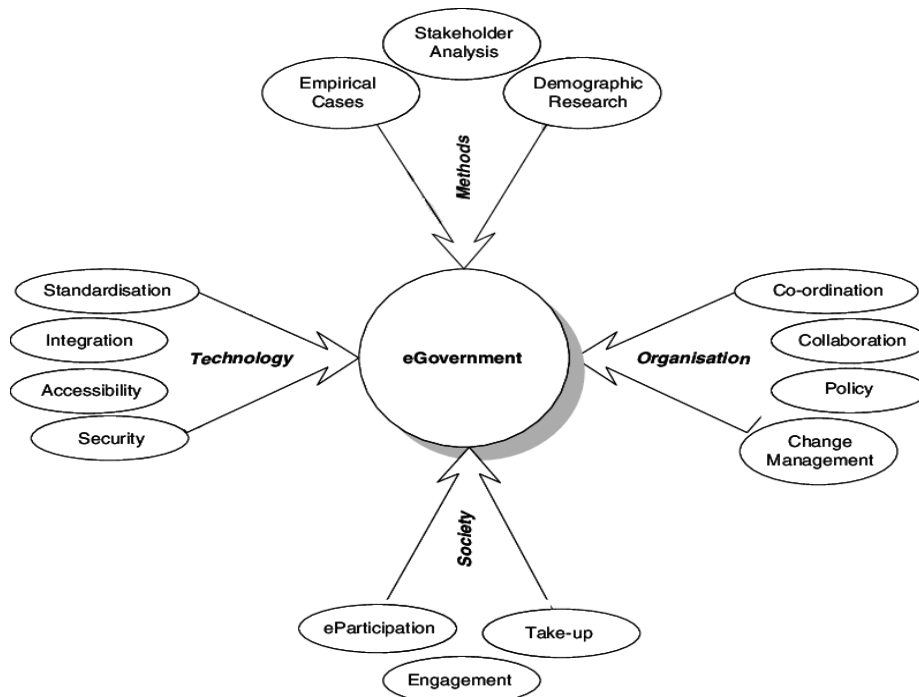
Figure 1: Stakeholder in e-government policies (Shouran et al., 2019)

Wallang (2018) discussed in his paper that the citizens' willingness to adopt the technological innovations that their governments are offering is a question that needs academic as well as practical study. Low rate of adoption from the people does not allow them to achieve the vast benefits that are the potential of these initiatives despite the substantial investments in these policies by the government (Chen & Aklikokou, 2019; Rose, Flak, & Sæbø, 2018).

The governments of developing countries are dedicating a large amount of time and funds to e-governance policies but they are facing failures due to misplaced perceived value of e-governance. Many studies have discussed the factors that are affect the citizens' behavior of adoption but very few e-government studies exist that have focused on the demand end from the stakeholders' perspective (Lee, Kim, & Ahn, 2011). In addition, most of these studies don't focus on developing countries and invest huge resources in studying developed states (Al-Hujran, Al-Debei, Chatfield, & Migdadi, 2015).

Even though studies exist in this area (Chen & Aklikokou, 2019), they do not study the mediating effects that the perceived value has on the adoption of e-governance. This is a major study gap considering the socio-cultural, economic and political differences in developing countries. This study focuses on how the perceived value of e-governance is affecting citizen behavior in the context of Thailand. Following are the objectives for this paper:

- To analyze the impact of determinants of behavioral intention (social influence, trust, openness, technological risks and other facilitating factors) on the intention to use e-governance services in Thailand.
- To study the mediating effects of perceived value in between the determinants of behavioral intention and the intention to use e-governance services in Thailand.

The scope of this research is limited to studying the factors that have an effect on the usage behavior of the citizens of Thailand. Previous work in has helped the government of Thailand to understand that the obstacles to adoption of e-governance to its full capabilities lie in the issues like digital divide (Malisuwan, Kaewphanuekrungsi, & Milindavanij, 2016), lack of competency in software usage, policy making issues and problems of content management. These studies have included empirical and theoretical data that has allowed for better policymaking. In this research, the author will through light on the mediating effects of perceived value of e-government on the behavioral intention to use e-governance services.

LITERATURE REVIEW

Theoretical models for Behavioral Intention to Use e-government

Many models have been proposed to explain the behavior of user acceptance and intention of usage (Kurfalı, Arifoğlu, Tokdemir, & Paçin, 2017; Munyoka & Manzira, 2014), however, the most used model is still TAM.

TAM and UTAUT

Davis (1989) first proposed this model in his paper to explain how the users' acceptance and usage mechanism towards any new technology introduced to them. TAM originally used PU and PEOU as a measure to determine user acceptance but over time few other constraints have been added to this model (Nikou & Economides, 2017). The behavioral intention of use in TAM is affected by the attitude towards usage (ATU) as well as PU and PEOU.

UTAUT is a TAM modification that considers that there are several influencers that affect behavioral intention of usage. These influencers are trust, technological risks, social influence, openness and some additional facilitating factors. The model for this research paper is majorly based upon UTAUT.

E-Government and determinants of usage behavior

Globalization and ICT gave birth to the field of e-governance in the late 1990's and since then successive reforms have taken place in the public administrative systems (Mensah & Mi, 2019). Chen and Aklikokou (2019) explain e-governance in two steps; first ICT is used in all daily government activities and secondly it is used for the

provision of quality information and services to the public through web based portals. From the perspective of the citizens, e-government makes it easy for them to have access to all the necessary services at any time and from anywhere, at a fixed, economical cost and in a simple and convenient manner (Susanto & Aljoza, 2015). In some countries, citizens are reluctant to use e-governance services due factors like distrust in the government and a missing strong leadership (Alryalat, Dwivedi, Williams, & Rana, 2013).

Behavioral intention can be explained as the probability of occurrence of a user behavior in response of a particular need/situation. In context of this paper, BI of use can be explained as the probability that a citizen will use e-service portals to meet his public service needs. The factors that have a significant effect on BI of use in our research model are explained below.

- Social influence is the level of pressure that an individual feels he is under from his social companions to accept or use a new system. The past studies have shown a positive impact of social influence on the users' BI to use e-government systems (Nikou & Economides, 2017). In Thailand, there is a general gap in technology acceptance and thus this has led to a social perception of rejection towards e-governance. This is the main cause of failure of past ventures (Sagarik, Chansukree, Cho, & Berman, 2018).

H1: Social Influence has a significant impact on the citizens' behavioral intention to use e-government systems.

- Trust is one of the major factors that influencing the usage behavior and intention. If the people have a trust in the government's abilities to provide them accurate and efficient e-services, then they would feel a sense of security and indulgence towards using the e-governance portals (Wallang, 2018). In developing countries, the trust levels of the people in their government are lower, which in turn affect the usage behavior of e-services.

H2: Trust has a significant impact on the citizens' behavioral intention to use e-government systems.

- In context of our research, the degree of psychological readiness towards the use and acceptance of e-governance can be termed as the degree of openness. Technological anxiety mitigates ease of use, but in contrast, degree of openness encourages an intention of using e-services(Gelbrich & Sattler, 2014).

H3: Degree of openness has a significant impact on the citizens' behavioral intention to use e-government systems.

- Technological risks are perceived as a risk factor by the users of e-governance policies and services (Dwivedi et al., 2017). We can define the perceived risk as a citizen's expectation of facing a loss while in pursuit of a desired service outcome. Dwivedi et al. (2017) have suggested in their study that the risks that are

involved in the usage of a system are directly affected by the user's feelings about the system which, in turn, affect the user's intention of use.

H4: Technological risks have a significant impact on the citizens' behavioral intention to use e-government systems.

- Any necessary organizational conditions or the infrastructure provided to help in promoting ease of use are called facilitating conditions (Dwivedi et al., 2017). Facilitating conditions work to give access to the citizens to the e-governance services. These conditions are an important indicator of intention of use and thus affect the perceived value of e-governance as well.

H5: Facilitating conditions have a significant impact on the citizens' behavioral intention to use e-government systems.

Mediating role of Perceived Value of E-governance between determinants of behavior and the intention to use e-governance services

Perceived value of e-governance by the citizens is actually the difference in the value expectations of users from the e-governance portals and the actual value that is received. Perceived value is a function of the level of trust that public puts in a system and the gain that it achieves from that trust. In this research we have linked the perceived value with the level of ease of use and usefulness that the user perceives while using the e-governance portals of the Thai government.

- PU is the degree of trust that an individual puts in a system for

accomplishment of any task (Jackson, Mun, & Park, 2013; Kurfalı et al., 2017). In the context of this research we can define PU as the level of belief that a citizen has in the services provided by the e-government for beneficial and efficient delivery of value.

- PEOU is the level of ease that a user feels while using a system. An increase in the level of ease of use will increase the level of trust and value that a user puts in a system. PEOU has been found to affect the PU as well (Abdullah & Ward, 2016), thus, as whole having a major effect on the perceived value.

The determinants of behavior that have been discussed in the previous sections play a vital role in creating a perceived value in the citizens' mind about e-government services. Trust and SI are the most important driving forces in this aspect. Influence from the society will encourage the user to put trust in the e-governance system and induce satisfaction and acceptance in the users. Similarly, other determinants like technical risks, openness of internal and external processes and other facilitating factors will also have significant impact on the perceived value of e-governance systems. A system that is free of technical failures and offers open view of processes will be perceived to have more value for the user as compared to one that does not have said features. Thus, it can be deduced that determinants of behavior have a significant effect on perceived value of a system. This level of perceived value will then, in turn, have a governing

impact on the usage intention and shape the behavior of the users accordingly. Studies have also shown perceived value to have an impact on behavior of use (Twizeyimana & Andersson, 2019). . (Harrison et al., 2012) argued that the governments should first aim to create a level of public value and only then can they achieve public readiness to adapt e-governance.

H6: Perceived value of e-governance plays a mediating role between the determinants of behavior and the behavioral intention to use e-government systems.

Research Model:
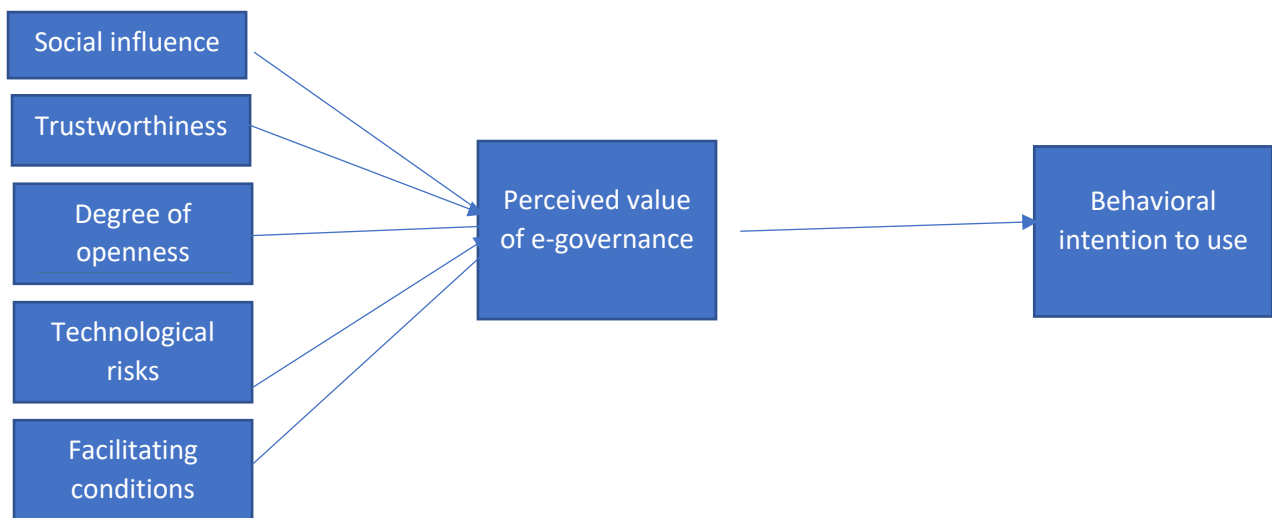
Figure 2: Research Model

RESEARCH METHODOLOGY

Population and Sample

The proposed study has been examined with the objective to observe the impact of social influence, degree of openness, trustworthiness, technological risk and facilitating conditions on the behavioral intention to use E-Governance, in mediating role of perceived value of E-Governance. Population of proposed study is Thailand and sampling frame consist of those government organization of Thailand, which used the E-Governance policies in their organization. Researcher selects the employees and managers of these organization by the help of purposive sampling technique because researcher required to collect the data only form those which have knowledge about functionality of E-Gov and can described the impact of specific determinant on the behavioral intention to use E-Gov. Moreover, researcher selects the sample size on the base of Klein (2015) idea such as number of questions*10, for the propose study sample size has been calculated is 35*10=350. Questionnaires have been distributed among 350 respondents but after discarding invalid responses only 298 considered valid.

Data Collection Procedure

In the proposed study, researcher preferred to collect the data through survey questionnaire because by following this way researcher collect the data in numeric form, which researcher

can easily be analyzed through statistical techniques. Researcher verified all the survey items by collecting the feedback of involved parties regarding the wording, ordering, format and understandability of survey questions, by conducting the pilot study (involved 23 respondents). Afterward, researcher must check the language and content validity of measures in order to collect the authentic outcomes. After finalizing the questionnaire, researcher administered it through self-administering technique, in which researcher personally visit the respondent. As the respondents faced some difficulties in understanding the specific terms that's why this technique enables the researcher to solve their queries immediately.

Measurement Model

Researchers evaluate the reliability of measurement model through SPSS by examining two criteria such as Cronbach's α and composite reliability. Both of them must have the values greater than 0.70 because it ensured the internal consistency and items reliability respectively. Coming towards validity, it has been assessed through AMOS by examining different criteria for convergent and discriminant validity. For assessing the convergent validity, (1) average variance extracted has to be greater than 0.50 and (2) items loading λ has to exceed the threshold range 0.70. Discriminant validity has been assessed on the bases of criterion such as square root of AVE has to exceed as compared all other constructs.

For identifying the risk of common method bias in proposed study, researcher consider the Harman's single factor test. Criterion on the ground of

which test has been accompanied is that inexistence of CMB is observed only when not more than 50% of variance accounted by single factor. It has been tested that only 18% of variance interpreted by single factor and 84% of variance accounted by multiple factor that's why inexistence of CMB is ensured.

Measures

In the proposed study, researcher measured the independent, dependent and mediatory variable on the basis of variable scale items which he or she has been adapted from research work such as researcher adapt the items for social influence from research work of (Caruana, 2002), items for degree of openness from (Hamidi & Safabakhsh, 2011), items for trustworthiness from scale of (Hien, 2014), items for technological risk from scale of , items for facilitating conditions from (Hill & Alexander, 2017), items for perceived value of E-Governance from scale of (Jamal & Naser, 2002) and adapt items for behavioral intention to use from scale of (Kalsi, Kiran, & Vaidya, 2009). Respondents' responses regarding the survey items have been recorded in 5-point scale, in which responses are ranges from strongly disagree to strongly agree.

Hypothesis Testing

In this section, relationship among different hypotheses has been tested by using structure equation modeling, which operate under the AMOS. It has been considered mandatory to test all the hypothesized relationship because acceptance or rejection status can only be reported on the bases of test results. Researcher analyzed the structure model

through path analysis approach, which works under AMOS for running the diagnostics of structure equation modeling. In this approach, researcher checked the standardization of path and significance of influenced path because it enables the researcher to report that which hypothesis get accepted or which get rejected.

DATA ANALYSIS AND INTERPRETATION

Demographic details of the respondents

The aim of the study was to know the impact of social influence (SI), trustworthiness (TW), Degree of openness (DO), Technological risks (TR) and Facilitating conditions (FC) on Behavioral intention to use (BIU). This study also had the aim to know the mediating role that Perceived value of e-governance (PVEG) plays between social influence (SI), trustworthiness (TW), Degree of openness (DO), Technological risks (TR) and Facilitating conditions (FC)

and Behavioral intention to use (BIU). This study was conducted in Thailand. Out of the total 292 respondents of this research, 112 were male and 180 respondents were females, which means that majority of the respondents were females. Out of the total 292 respondents of this research, twenty-three of the respondents had completed their graduation, one hundred and thirty-six respondents had completed their post-graduation, one hundred and twenty-three respondents had completed their masters and ten respondents had other degrees. Out of the total 292 respondents of this research, 230 of the respondents were between the age of 21 to 30 years, 42 of the respondents were in the age range of 31 to 40 years, 18 of the respondents were between the age of 41 to 50 years, and lastly 2 of the respondents were more than 50 years old in age, which means that 61% of the respondents were young in age.

Descriptive results of the data

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
SI	292	1.00	5.00	3.5890	1.06026	-.788	.143
DO	292	1.00	5.00	3.5514	1.08410	-.804	.143
TS	292	1.00	5.00	3.3607	1.14240	-.422	.143
TR	292	1.00	5.00	3.3973	1.15887	-.500	.143
FC	292	1.00	5.00	3.5183	1.13538	-.586	.143
PV	292	1.00	5.00	3.5651	1.18600	-.596	.143
BIU	292	1.00	5.00	3.4235	1.20576	-.567	.143
Valid N (listwise)	292						

The above table 1. is showing the descriptive statistics of the study. The descriptive statistics are a detailed description about the variables and they show descriptive coefficients that give a

summary. This set of given data represents the entire sample of the population. The data is showing that there is no outlier in given data because maximum values are in the threshold

range of 5-point Likert scale and skewness value is between -1 to +1, which is the threshold range of normality so, the data is normal and valid. The data is valid to go for further testing.

Rotated component matrix

Table 2. Rotated Component Matrixa

	Component						
	1	2	3	4	5	6	7
SI1				.779			
SI2				.821			
SI3				.787			
DO1					.781		
DO2					.791		
DO3					.832		
TS1			.836				
TS2			.858				
TS3			.823				
TR1						.719	
TR2						.782	
TR3						.724	
FC1							.707
FC2							.743
FC3							.719
PV1	.809						
PV2	.809						
PV3	.746						
BIU1		.818					
BIU2		.791					
BIU3		.716					

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 6 iterations.

Above table 2. of rotated components matrix is showing that almost all of the indicators are having factor loading more than 0.7, it means that all the indicators are eligible to be exposed to further hypothesis testing techniques, because all the factors are in suitable threshold level and all are in suitable and valid sequence and range, this data is good to go for further testing techniques, there is no cross loading in the data shown in the RCM. So, the data is reliable.

Convergent and discriminant validity

Table 3. Convergent and discriminant validity

	CR	AVE	MSV	MaxR(H)	PV	SI	DO	TS	TR	FC	BIU
PV	0.919	0.792	0.677	0.920	**0.890**						
SI	0.886	0.721	0.430	0.952	0.482	**0.849**					
DO	0.886	0.722	0.450	0.966	0.465	0.604	**0.849**				

TS	0.878	0.706	0.319	0.973	0.408	0.546	0.565	**0.840**		
TR	0.766	0.522	0.450	0.975	0.492	0.656	0.671	0.499	**0.723**	
FC	0.930	0.817	0.677	0.981	0.823	0.586	0.497	0.443	0.547	**0.904**
BIU	0.923	0.800	0.656	0.985	0.798	0.509	0.504	0.401	0.510	0.810	**0.894**

Validity master sheet was used to confirm the convergent and discriminant validity of the research model variables. Discriminate validity provided the discrimination between variables while the convergent validity was measured with the help of composite reliability and average variance extracted. The results of the validities are shown in the table 3. The results and convergent and discriminant validity show that the overall model is a good fit because the composite reliability of each variable is more than 70% and average variances extracted is more than 50% while the discriminant validity showed that loading of each variable discriminates from others. Every variable has maximum loading with itself as compared with others so, these validities prove the authenticity of the collected data.

CFA

Table 4. CFA

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	1.113
GFI	Equal or greater .80	.943
CFI	Equal or greater .90	.996
IFI	Equal or greater .90	.996
RMSEA	Less or equal .08	.020

Table 4. is of CFA. Confirmatory factor analysis, is used to confirm the fitness of hypothetical model before structural equation modeling. Current results are showing that CMIN is less than 3, GFI is more than 0.80, CFI is greater than 0.90, IFI is greater than 0.90, and RMSEA is less than 0.08. so, the data is in a valid range and is good to go for further testing. Following is the screenshot of CFA in Figure. 1.
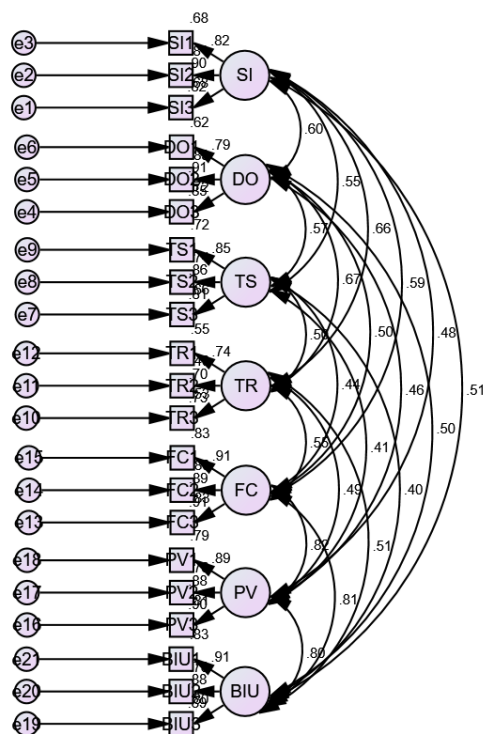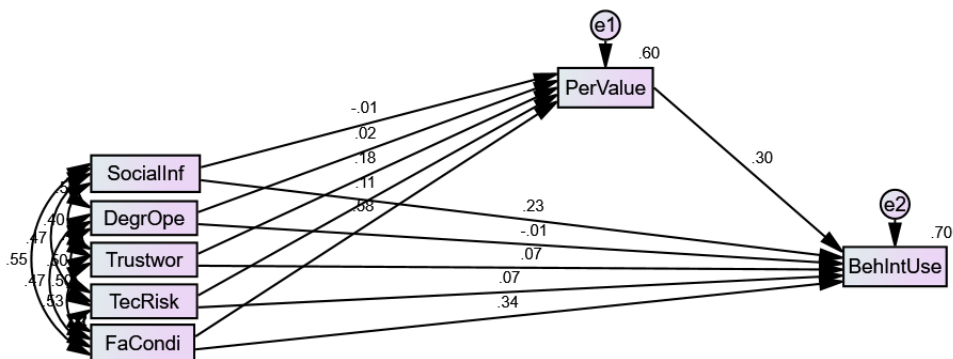
Figure 1: CFA

Figure 2: SEM

Table 5: SEM

TOTAL	FC	TR	TS	DO	SI	PV
PV	.581***	.112	.180**	.021	-.009	.000
BIU	.518***	.102	.127**	-.006	.230**	.299**
Direct	FC	TR	TS	DO	SI	PV
PV	.581***	.112**	.180**	.021	-.009	.000
BIU	.344***	.069	.073	-.013	.232**	.299**
Indirect	FC	TR	TS	DO	SI	PV
PV	.000	.000	.000	.000	.000	.000

BIU	.174**	.033*	.054*	.006	-.003	.000

The results of structural equation modeling in table 5. These are showing the impacts and relationships of different variables. The total impact of FC on PV is significant and positive. The total impact of FC on BIU is significant and positive. The total impact of TR on PV is significant and positive. The total impact of TR on BIU is significant and positive. The total impact of TS on PV is significant and positive. The total impact of TS on BIU is significant and positive. The total impact that DO casts on PV and BIU is seen to be insignificant. The total impact of SI on PV is insignificant and the impact on BIU is significant and positive. Moreover, the total impact of PV is significant and positive as well. TR is directly impacting PV significantly and positively and indirectly it is impacting BIU positively and significantly.

DISCUSSION AND CONCLUSION
Discussion

The aim of this study was to know about the impact of social influence (SI), trust worthiness (TW), degree of openness (DO), technological risks (TR) and facilitating conditions (FC) on behavioral intention to use (BIU). This paper also aims to know the mediating role that perceived value of E-governance (PVG). The first hypothesis proposed by this study was that, "SI has a significant impact on BIU." This hypothesis is accepted as according to the (Prabhu, 2013), SI triggers a person to create an intention to use the E-governance, so, a positive and significant is noticed. The second hypothesis was that, "TW has a

significant impact on BIU." This hypothesis is rejected, as the analysis has proved that TW insignificantly impacts the BIU. The third hypothesis proposed was that, "DO has a significant impact on BIU." This hypothesis was rejected, as according to the (Rajput, Aharwal, Dubey, Saxena, & Raghuvanshi, 2011), DO does not have any significant effect on BIU and same was observed with the results of analysis. The fourth hypothesis prosed was that, "TR has a significant impact on BIU." This hypothesis is also rejected. As overall in the model TR does not have any significant impact on BIU. The fifth hypothesis proposed was that "FC has a significant impact on BIU." This hypothesis is accepted. According to (Smitha, Thomas, & Chitharanjan, 2012), FC enhance the inclination and the intention towards the use of E-governance practices. The study also proposed that the mediating role of PVG is significant between FC, TW, TR and BIU is significant. Whereas, the mediating role of PVG between DO, SI and BIU is insignificant.

Conclusion

The aim of this study was to know about the impact of social influence (SI), trust worthiness (TW), degree of openness (DO), technological risks (TR) and facilitating conditions (FC) on behavioral intention to use (BIU). This paper also aims to know the mediating role that perceived value of E-governance (PVG). Study was conducted in Thailand and the total sample was 292 respondents, in which most of the respondents were young and the

abundance was of females. The data was tested and validated using SPSS and AMOS. Moreover, the data was also validated using CFA and SEM. The research showed that the impact of FC and SI is positive and significant on BIU. Whereas, TR, DO and TW have insignificant impact on BIU. The study also proposed that the mediating role of PVG is significant between FC, TW, TR and BIU is significant. Whereas, the mediating role of PVG between DO, SI and BIU is insignificant.

Implications of the study

The study has significantly emphasized the factors which can increase or decrease the BIU to sue E-governance practices. The study has significantly contributed to the theoretical material regarding the mediating role of PVG between the factors affecting BIU and BIU. The factors that have a positive and significant impact on BIU, like FC, TW, SI and PV can be practically enhance in order to enhance the PVG and BIU in the organizations. Moreover, E-governance can be fully exploited by the organization if it is taken as a part of integral policies of the organization along with the implementation of the factor having a significant and positive impact on it. All of these are the significant implications of this study, which can be exploited theoretically, practically and in the policy making process.

Limitations and future research indications of this study

Like all other studies, this study also includes major limitations, because of the lack of time allotted to gather the data and to conduct the research was limited, as a result the sample size and the gathered data was also be limited to a small. The problem of risks and lack of surety about E-governance practices is not only regarding Thailand but also all the other developing countries as well, future researchers are recommended to expand the scope of study by expanding the population nd targeting other countries as well. Moreover, enhanced time frame should be sued in future studies. Moreover, more sectors should be focus in the future studies so that the results can be generalize to a larger population eliminating the limitations of the research. The future researchers are recommended to conduct longitudinal study to provide a comparison in before and after situation. The future studies can also consider the mediators like quality of E-governance practices, services of E-governance practices and improvement in governance because of E-governance.

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