An Investigation of Mobile Government Adoption Behavior 'Case of Thailand'

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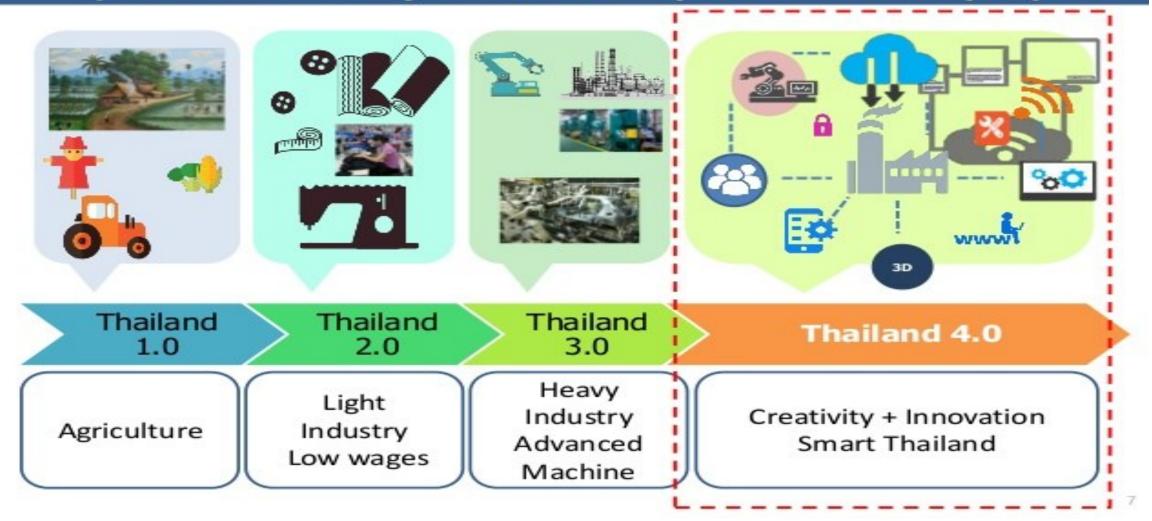
Introduction: Background of the research topic

- Government try to utilizes new technology to improve the way to contact their citizen (Riddick C., Zheng Y., 2017).
- ❖ With the development of new technology enables government to provide services to their citizen anywhere anytime where internet and computer are available (Almuraqab Nasser, 2017).
- The significant improvement of mobile technology makes smartphone more available with more features leads to the increasing of smartphone user worldwide and in Thailand. (Statista.com, 2019), (NSO, 2019)
- Therefore, the government agencies take this opportunity to provide services to their citizen thru the mobile channel. (Stuti Saxena, 2018)
- The Thailand digital government development plan 2017-2021 has been implemented to support Thailand 4.0 economic model to transform government to be the digital government

Introduction: Background of the research topic

- Mobile government can be defined as "the use of mobile and wireless communication technologies, such as mobile app, within the government to deliver information and services to citizens and businesses" (Ntaliani et al, 2008)
- ❖ Mobile government is the subset of E-government (Lallana, 2004) and enables government to improve their quality and availability of their services including improving civic engagement as well (Almuraqab Nasser ,2017), (Riddick C. and Zheng Y.,2017)
- ❖ User acceptance of mobile government affects the success of the mobile government project. Therefore, it is necessary to understand what factor might influence citizen to adopt mobile government (Almuraqab et al, 2017).

Thailand 4.0 (Smart Industry + Smart City + Smart People)



Source: Olivier Languepin, Thailand 4.0 What do you need to know?, Thailand Business News

Introduction: Thailand Digital Government

- ❖ Thailand Digital Government Development Plan 2017-2021
- 4 Goals
 - Improving Country's Digital Government-related Ranking and Indices
 - Providing Government Services that Response to Country's Demands of all Sectors Rapidly, Precisely, and Paperless
 - Creating Government Data that Easily Accessed and Improve Government Transparency and Public Participation
 - Developing Digital Government Infrastructure that Collect and Manage Integrated Database, Support Cooperation among Agencies, and Efficiently Provide Government Services (Source: DGA)

❖ 3 RELATED Indicators

- ❖ Increasing the country's E-Government Development Index by25%
- ❖ Increasing the country's E-Participation Ranking by 5 ranks
- Creating at least 100 smart services* and ensuring at least 50 services are up to 'Digital Service Standard' (Source: DGA)

Introduction: Research Motivation

- ❖ Based on Thailand development plan, The government plan to transform to be the Digital government
- * Based on the literature, most of the studies focus on E-government and focus on developed countries. (Stuti Saxena ,2017).
- There is no study focus on mobile government adoption factors in South East Asian countries, including Thailand.
- This study aims to fill the gaps to gain understanding what factor affects the adoption of mobile government in Thailand to provide insight and better understanding to successfully implement mobile government project in Thailand

Introduction: Purpose of The study

- This study intent to identify what important factors that affect the mobile government adoption in Thailand
- How those factors influence Thai citizen to adopt mobile government

Introduction: Research Questions

- RQ1: What are the important factors for Thai Citizens that influences the behavioral intention to adopt mobile government?
- * RQ2: What type of relationships are there among these factors?
- RQ3: Which factors have a significant casual effect in the intention to use mobile government?
- RQ4: What are the theoretical and practical implications of the answer to RQ3?

Introduction: Expected Outcome

- Provide more theoretical understanding of what and how citizen adopt mobile government in Thailand
- Provide useful information for practitioner or government to used to successfully implement mobile government project
- ❖ Provide better understanding in theories related to IT usage ,especially in the mobile government field in South East Asia region.

Introduction: Scope of the study

- This study identifies the important factors that influence Thai citizen to adopt mobile government.
- The population in this study are Thai citizen who live in Bangkok or in the metropolitan area (Nakhon Phathom, Nonthaburi, Pathum Thani, Samut Prakarn and Samut Sakorn)
- The respondents for this study are required to be at least 18 years old in order to be mature enough to understand each construct in the theoretical model.
- ❖ The respondents are required to have smartphone or table computer with internet access.
- The mobile government in this study includes only the services between government and citizen.
- This study focuses on accessing mobile government with smartphone and table computer.

Introduction: Scope of the study

- This study applies technology acceptance model (TAM), and the Unified theory of acceptance and use of Technology (UTAUT), Information systems success model and Trust model.
- The other factors that are commonly used to investigate other IT system adoption based on previous studies will be applied in this study as well.
- * The questionnaire will be used as the research instrument.

Research Methodology (1/4)

- A Quantitative research
- Unit of analysis: Thai individual, 18 years old or above with smartphone or tablet computer with internet access
- Self-administrated structured questionnaire will be used to measured at single point at time
- This study is mainly explanatory research with employing descriptive statistical techniques for data analysis and employs structural equation modelling (SEM) techniques for analysis and developing theoretical causal model using AMOS22

Research Methodology (2/4)

- Development of a Proposed Theoretical Model:
 - Reviewing from related existing theory
 - Variables from related previous studies
- Development of Questionnaire:
 - ❖ <u>A structured self-administrated questionnaire</u> will be designed based on 9 independent variables and 2 dependent variable identified in literature review
 - ❖ 2 sections, to understand person characteristics and to measure the model variables
- The total population is approximately 9.5 million people (The national statistic office).
- The sample size is determined to be approximately 400 based on Yamane, 1973 for the 95% confidence interval with a 4% margin of error.
- The simple random sampling technique will be used

Research Methodology (3/4)

- Missing Value and outlier:
 - A conservative approach will be used to deal with missing value and outlier by removing the corresponding questionnaire.
- Construct Validity:
 - ❖ Principle Components factor analysis will be used to assess the construct validity of the measurements of the indicators for each latent model variables
- ❖ Internal Consistence Reliability:
 - using Cronbach 's alpha to validate internal consistency reliability
 - * The indicator of each latent variable will be removed if it improves the internal consistency reliability.
 - ❖The appropriate cronbach alpha coefficients is at least 0.7 (George D. and Mallery P.,2003)

Research Methodology (4/4)

- The preliminary Descriptive Statistic will be performed by using SPSS software following the guidance provided by Coakes and Steed, 2003.
- The analysis of Theoretical Model and the development of a final model will use Structural Equation Modelling (SEM) techniques implemented with AMOS 22 based on the guidance provided by Kline, 2005.

- Mobile Government
- Review of related basic theories of technology Adoption
- Previous related studies
- Important Constructs and Relationship

Literature Review: Mobile Government

Definition:

- The use of mobile and wireless technology by the government to deliver the information and provide services to their citizens and businesses. (Christopher and Reddick, 2017)
- ❖ Providing the government-related information and services to the citizen with time and location independent thru the various of mobile platforms such as cellphone or tablet. (Liu Y. et al. 2014)
- * Has been adopted by government in many countries such as India, China, USA etc. (Stuti, 2017)
- ❖ Increase the level of civic engagement, save time and cost (Reddick, C. and Zheng, Y., 2017)
- Improve the transparency of between the citizen and their government by removing the bureaucratic structures and procedures (Almuraqab Nasser. ,2017)
- The level of Mobile government intuitive is not equal in different countries due to the difference of mobile technology and the e-government development (Stuti Saxena, 2017)
- ❖ It is important to understand what are the adoption factors for the citizens to adopt mobile government services. (Stuti Saxena, 2017)

Technology Acceptance Model (TAM)

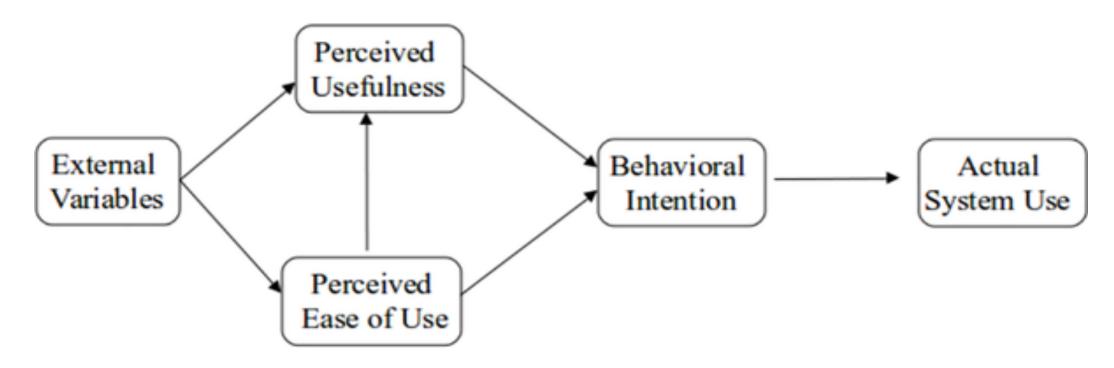
- The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept a technology and how they use that technology
- Developed by Fred Davis in 1989
- Adopted from the Theory of Reasoned Action (TRA)
- * TAM posits that an individual's salient beliefs about a system (perceived usefulness and perceived ease of use) determine his/her attitude towards using the given system.
- Attitude is the individual's positive or negative feelings towards a behavior.

Literature Review: Technology Acceptance Model (TAM)

- Perceived usefulness is the individual's salient belief that using a particular technology will improve his/her performance.
- Perceived ease of use is the individual's salient belief that using a particular technology is free of effort.
- Attitude determines the individual intention to adopt the system, which in turn, determines actual system use.
- Attitude only partially mediated the effect of perceived usefulness and perceived ease of use on behavioral intention; therefore attitude was excluded from the parsimonious TAM
- ❖TAM has been widely used to scrutinize individual technology acceptance behavior in various types of information systems.

(Source: Fishbein M, Ajzen I. Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. MA: Addison-Wesley; 1975)

Literature Review: Technology Acceptance Model (TAM)

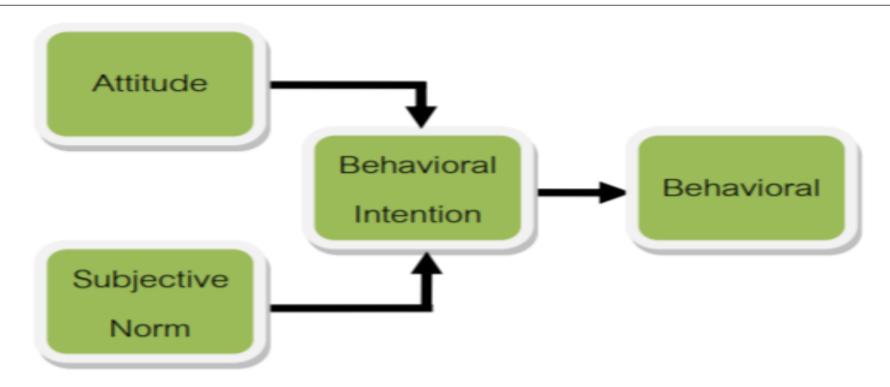


Source: Diop EB, Zhao S, Duy TV (2019) An extension of the technology acceptance model for understanding travelers' adoption of variable message signs. PLOS ONE 14(4): e0216007.

Literature Review: Theory of Reasoned Action (TRA)

- Developed by Martin Fishbein and Icek Ajzen (1980)
- TRA suggests that a person's behavioural intention depends on the person's attitude about the behaviour ("Would I do this sort of thing normally?") and subjective norms ("Would other people in the group do this?")
- 2 focuses (constructs)
 - Beliefs about that behavior will shape behavioral intent → Attitude
 - Social influences will shape behavioral intent -> Subjective Norm

Literature Review: Theory of Reasoned Action (TRA)

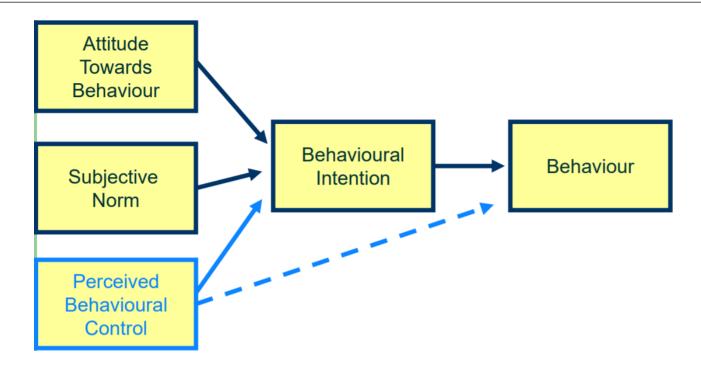


Source: M. Fishbein, and I. Ajzen, Belie, Attitude, Intention and Behavior: An Introduction to Theory and Research, Addison-Wesly, Reading, MA, 1975

Literature Review: Technology Planned Behavior (TPB)

- Developed by Ajzen (1991)
- The TPB adds the notion of Perceived behavioral control which refers to a person's perceptions of their ability to perform a given behavior.
- The TPB suggests that human action is guided by three factors which are behavioral, normative and control beliefs.
- The TPB addressed the weakness of its predecessor TRA in permitting prediction behaviors not be entirely under volitional control
- The TPB incorporated perceived behavioral control (PBC) an additional determinant of human motivational intention to the TRA
- The addition of perceived behavioral control enabled TPB to be used to predict and examine human intentions and behavior in situations where individuals might lack control over their own behavior

Literature Review: Technology Planned Behavior (TPB)



Source: I. Ajzen, "The Theory of Planned behavior," Organizational behavior and Human Decision Processes, vol. 50, no. 2, pp. 179-211, 1991.

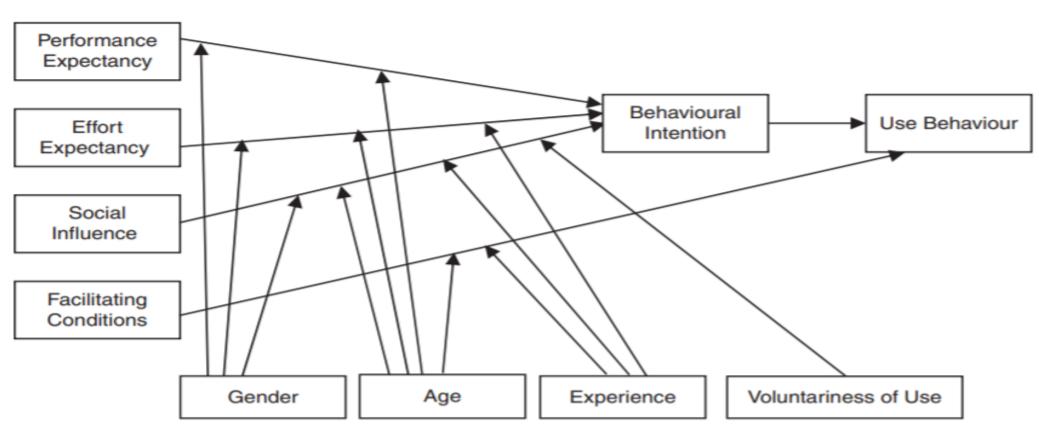
The Unified Theory of Acceptance and Use of Technology (UTAUT)

- Developed by Venkatesh et al. (2003)
- ❖ A Unified model that brings together alternative views on user and innovation acceptance
- The UTAUT suggests that four core constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) are direct determinants of behavioral intention.
- These constructs are moderated by gender, age, experience, and voluntariness of use
- The UTAUT aims to explain user intentions to use an information system and subsequent usage behavior.

The Unified Theory of Acceptance and Use of Technology (UTAUT)

- The theory was developed through a review And consolidation of the constructs of 8 models that earlier researches had employed to explain information systems usage behavior
 - Theory Of Reasoned Action (TRA)
 - Theory Of Planned Behavior (TPB)
 - Technology Acceptance Model (TAM)
 - Motivational Model
 - Theory Of Planned Behavior/Technology Acceptance Model
 - Model Of Personal Computer Use
 - Diffusion Of Innovations Theory
 - Social Cognitive Theory

The Unified Theory of Acceptance and Use of Technology (UTAUT)



Source: Venkatesh *et al.* (2003)

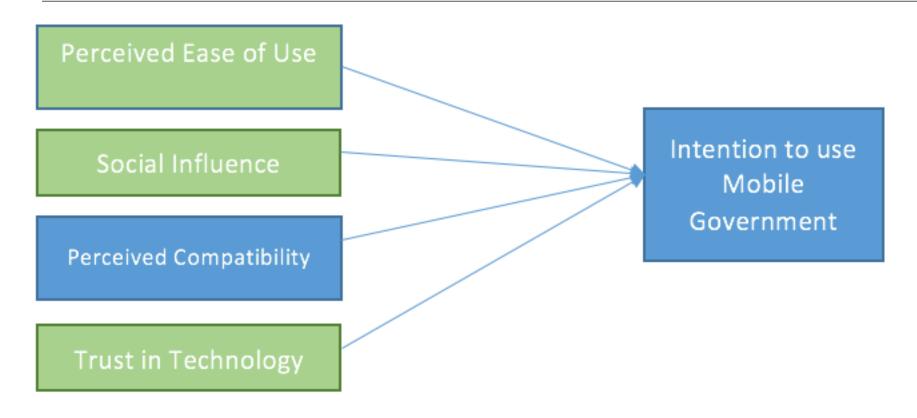
- This section reviews previous related studies which motivated the development of theoretical model used in this study
- The 5 studies were selected as followed

- Model by Al Athmay, Alaa Aldin & Fantazy, Kamel & Kumar, Vinod. (2016).
- Mobile government is part of E-government. (Lallana, 2004)
- Studied E-government adoption factors in UAE, which is considered as developing country same as Thailand
- Adopted UTAUT (Social Influence, perceived effectiveness) and Information systems success model (Delone and Mclean ,2004) (System Quality, Information Quality, User Satisfaction)
- Found that User Satisfaction has direct effect on E-government adoption and also play as intermediate variable



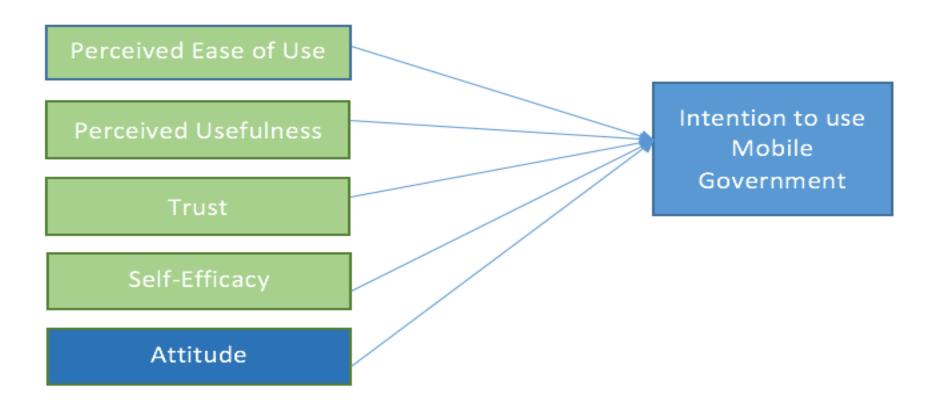
Source: Al Athmay, Alaa Aldin & Fantazy, Kamel & Kumar, Vinod. (2016).

- Model by Almuraqab Nasser (2016).
- ❖ Investigates the factors that influence the intention of citizens of the United Arab Emirates (UAE) to use a mobile government (m-Gov)
- Applied TAM, Diffusion of Innovation (DOI), Trust Model
- Found that perceived usefulness has no effect on intention to use mobile government



Source: Almuraqab, Nasser. (2016). M-Government adoption factors in the UAE: a partial least squaresapproach. International Journal of Business and Information. 11. 404-431.

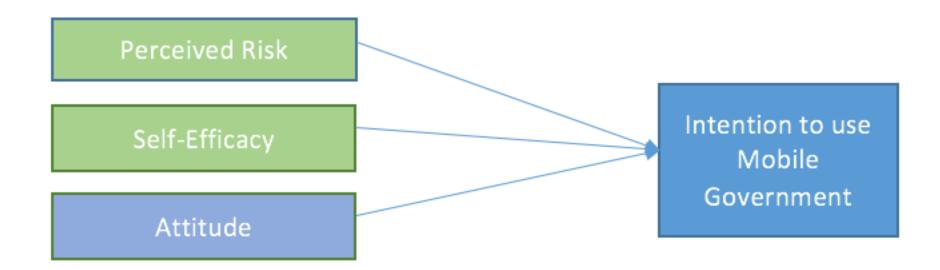
- Model by Stuti Saxena, (2017)
- Investigate the factors which influence mobile government (m-government) services adoption in India
- Applied TAM , TPB , UTAUT



Source: Stuti Saxena, (2017)

- Model by Stuti Saxena, (2018)
- Studied how perceived risk and other factors affect mobile governmet adoption in India
- Applied TAM , TPB , UTAUT
- Found that Social Influence has no effect on mobile government adoption

Previous Related Studies#4

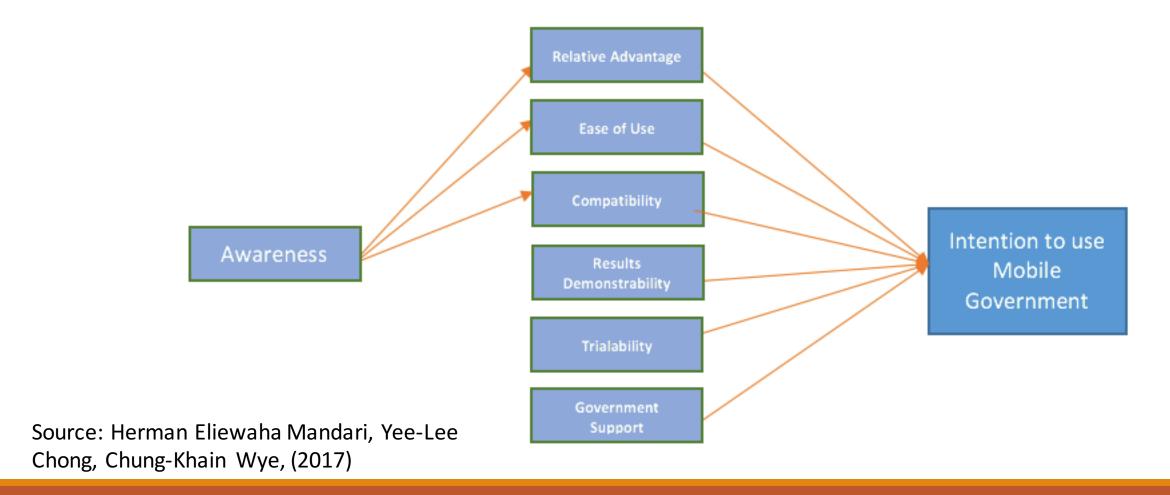


Source: Stuti Saxena, (2018)

Previous Related Studies#5

- Model by Herman Eliewaha Mandari, Yee-Lee Chong, Chung-Khain Wye, (2017)
- Identify adoption factors for mobile government in Tanzania
- Applied TAM , UTAUT , IDT
- Found that government support play as a critical role for successfully mobile government implementation

Previous Related Studies#5



- Perceived Ease of Use (PEOU)
 - Refers to the degree to which a person believes that using a particular system would be free of effort (Davis, F. D., 1989)
 - From TAM
 - Found to have positive effect on adoption of both E- government and mobile government base on a review by Almuraqab Nasser, (2016)
 - Perceived ease of use was also found to be the most significant factor in determining intention to use m-commerce for street vendor in Thailand. (Pipitwanichakarn et al, 2018)

- Perceived Usefulness (PU)
 - Defined as The degree to which a person believes that using a particular system would enhance his or her job (Davis, F. D. ,1989)
 - Also from TAM
 - ❖ Considered as one of the strongest indicators of technology acceptance as reflected in countless technology and systems adoption studies. (Al-Thunibat et al., 2011)
 - Also found to be the important adoption factors in citizens 'adoption of both e-government and mobile government (Almuraqab Nasser ,2016)

- Perceived Risk (PR)
 - Perceived risk implies an individual's belief of incurring a loss in pursuit of a given outcome (Stuti Saxena, 2018)
 - In mobile government context, PR could refers to citizens' perception of uncertainty and negative consequences or outcomes associated with adopting mobile government (Gupta, et al, 2018).
 - ❖ PR has been found having effect on e-government adoption in many studies, and also found to influence the adoption of mobile payment services in the Thai market (Phonthanukitithaworn, 2016)
 - PR was also found to be significant factor in adopting mobile system in other developing country such as India as well (Khushbu Madan, Rajan Yadav, 2016)

- Trust (TR)
 - ❖ Can be defined as the "willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trust or irrespective of the ability to monitor or control that other party" (Mayer R.C., et al, 1995)
 - Trust is an important factor in explaining m- commerce acceptance and has been integrated into the original TAM (Zhang, et al,2012)
 - Trust was found to have effect on intention to use mobile commerce in Thailand for street vendor as well as shown to be another factor affecting people's intention to adopt mobile payment services in Thailand (Phonthanukitithaworn, et al,2016; Pipitwanichakarn, et al,2018)
 - Trust was one proved one of the mobile government adoption factor in China (Wang,2014)

- Relative Advantage (RA)
 - ❖ Defined as the degree to which using particular technology (mobile government) is perceived to be better than using other communication strategies of using government services. Venkatesh et al. (2003)
 - Relative advantage was found to be one of the important factor both in e-government adoption and mobile government adoption (Carter et al, 2011)
 - In term of mobile government, Advantage such as mobility access to government services with real-time information anywhere anytime would be perceived to be better than using other communication strategies of government services

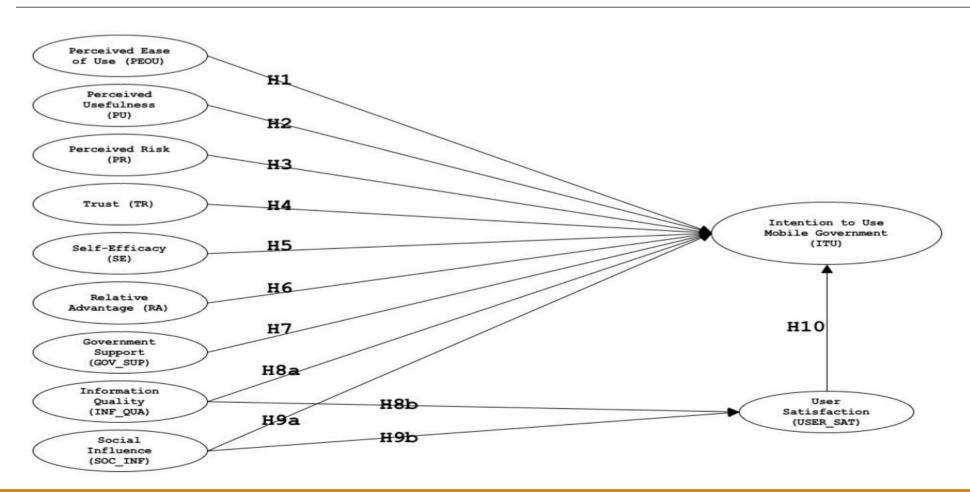
- Government Support (GOV_SUP)
 - *Refers to the degree of government investing in required mobile government infrastructures, providing regulations and framework which supports the use of mobile government (Herman, et al, 2017)
 - Government support is confirmed to be one of the important adopting factor for many technologies (Herman, et al.,2017)
 - Lacking of government support limits e-government acceptance (Herman, et al.,2017)
 - Good government support result in more citizens adopting mobile government (Qian, H. and Aquaro, V. 2014)
 - Government support was found to be the significant adoption factor in mobile system (Arjoon (2012), Tan and Teo, (2000)

- Information Quality (INF_QUA)
 - The quality of government mobile application is important and could affect the expectation of the citizen, Therefore, it is necessary to assess the quality of mobile government for improvement (Meiaad Rashid Alsaadie, et al. 2018)
 - * Refers to "the ability of the system to convey the intended meaning of information" (Wang, K. and Lin, C.-L., 2012)
 - One of the IS success model construct by DeLone, W.H., and McLean, E.R. 1992
 - The mobile service information quality has been proved influencing user to adopt those mobile systems.
 - The studies by Al Shibly ,Tadros (2010) and ALaa Aldin A AL Athmay, Kamel Fantazy, Vinod Kumar, (2016) influences both E-government and mobile government adoption.

- User Satisfaction (USER_SAT)
 - *Refers to the levels of experience and fulfillment citizens gain from using mobile government services
- A study by ALaa Aldin A. AL Athmay et al. (2016) also indicated that information quality has positive direct effect on the satisfaction of e-government services user in United Arab Emirates (UAE)
- The satisfaction of mobile system users consists of the quality of the information provided (Elsherif Hatem, et al., 2016)
- The accurate information in the mobile system was found positively affects the citizen mobile government service quality perception increasing the user's satisfaction leading to the increase of using mobile government services. (ALaa Aldin A AL Athmay, Kamel Fantazy, Vinod Kumar, 2016)

- Social Influences (SOC_INF)
 - *Refers to the degree to which use of a certain system (mobile-government services) is influenced by peers (Khaled Ahmed Al Mansoori, et al.,2018)
 - Important factors for intention to use both e- government and mobile government as summarized by Almuraqab Nasser, (2016)
 - One of the UTAUT Constructs
 - Social Influence was found positively affect user satisfaction for e-government system. (Athmay, et al., 2016)

Proposed Model



Proposed Model

- 11 Variables
 - 9 Independent Variables
 - 2 Dependent Variables
- 12 Hypothesizes based on literature review

Hypothesis

Hypothesis		
H1: Perceived Ease of Use (PEOU) will positively influence citizens' intention to use (ITU) mobile Government	H7: Government Support (GOV_SUP) positively affects the intention to use mobile government (ITU)	
H2: Perceived Usefulness(PU) will positively influence citizens' intention to use (ITU) mobile Government	H8a Information Quality (INF_QUA) have positive effect on intention to use mobile government (ITU)	
H3: Perceived Risk (PR) will have a negative effect on intention to use mobile -government (ITU)	H8b Information Quality (INF_QUA) have positive effect on User Satisfaction (USER_SAT)	
H4: Trust (TR) positively influences intention to use mobile-government (ITU)	H9a Social Influence (SOC_INF) will positively influence the intention to use (ITU) mobile Government services	
H5: Self-efficacy (SE) is positively linked with intention to use mobile-government (ITU)	H9b Social Influence (SOC_INF) will positively influence User Satisfaction (USER_SAT)	
H6: Relative Advantage (RA) will positively affect intention to use mobile government (ITU)	H10 User Satisfaction (USER_SAT) positively affects intention to use mobile government (ITU)	

Operational Definitions and Measurements of Variables (1/2)

Model Variable	Definition
Perceived Ease of Use (PEOU)	The degree to which a person believes that using a mobile government would be free of effort
	The degree to which a person believes that using mobile
Perceived Usefulness(PU)	government would enhance his or her job
	The potential loss associated with adoption of mobile
Perceived Risk (PR)	government and acts as an inhibitor to the adoption decision
Trust (TR)	The user's beliefs or faith in that a specific service can be regarded to have no security and privacy threats
	An individual's ability to perform information technology
Self-efficacy (SE)	related activities using a computer system

Operational Definitions and Measurements of Variables (2/2)

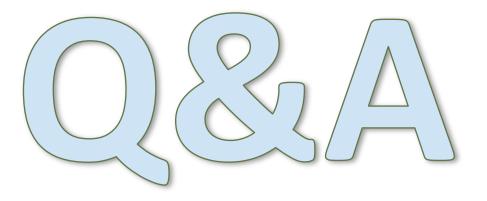
Model Variable	Definition
	The ability of the mobile government system to provide its citizens with new,
Information Quality (INF_QUA)	accurate, clear, and easy-to-understand information
	The degree to which use of a certain system (mobile-government services) is
Social Influence (SOC_INF)	influenced by peers
	The degree to which Mobile government is perceived to be better than using
Relative Advantage (RA)	other communication strategies of using government services in Thailand
	The degree of government investing in required mobile government
	infrastructures, providing regulations and framework which supports the use of
Government Support (GOV_SUP)	mobile government
	The levels of experience and fulfillment citizens gain from using mobile
User Satisfaction (USER_SAT)	government services in terms of content, speed, quality, security, and interface
Intention to use mobile government	The degree to which an individual intends, expects, and plans to use mobile
(ITU)	government

Measurement of Model Variables (1/2)

Variable	Type of Measure
-Gender (G)	
-Age (A)	
-Level of Education (E)	
-Living Location (LOCA)	Categorical converted to single interval scale
-Income (INC)	
-Mobile Device (MO)	
with internet Access	
Perceived Ease of Use (PEOU)	3 Indicators PEOU1 ,PEOU2,PEOU3
Perceived Usefulness(PU)	4 Indicators: PU1, PU2, PU3, PU4
Perceived Risk (PR)	5 Indicators: PR1,PR2,PR3,PR4,PR5
Trust (TR)	3 indicators: TR1, TR2, TR3

Measurement of Model Variables (2/2)

Variable	Type of Measure	
Information Quality (INF_QUA)	4 Indicators: INF_QUA1, INF_QUA2, INF_QUA3,	
	INF_QUA4	
	4 Indicators: SOC_INF1, SOC_INF2, SOC_INF3,	
	SOC_INF4	
Relative Advantage (RA)	3 Indicators: RA1,RA2,RA3	
Government Support	3 Indicators: GOV_SUP1, GOV_SUP2, GOV_SUP3	
(GOV_SUP)		
User Satisfaction (USER_SAT)	3 Indicators: USER_SAT1, USER_SAT2, USER_SAT3	
Intention to use mobile		
government (ITU)	ITU1,ITU2,ITU3	



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