Satisfaction with E-Government Portals: Perspective of Senior Citizens

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Keywords: E-Government Portals, E-Government Services, Perceived Value, Social Influence, Senior Citizen Satisfaction, Continuous Use Intentions, Malaysia.

Abstract: This study aims to investigate the level of user satisfaction with the services provided by e-government portals and to examine the effect of perceived value and social influence on senior citizens' satisfaction and their continuous use intentions. Through a questionnaire survey, primary data are collected from 123 senior citizens who use e-government portals. The findings show that senior citizens are moderately satisfied with the services provided by e-government portals and positive on their continuous use intentions. E-government portals in the area of health and tourism are used more heavily than others. Both perceived value and social influence relate positively with senior citizens' satisfaction, but perceived value has a relatively stronger effect on satisfaction than social influence. Senior citizens' satisfaction also positively affects their continuous use intentions of e-government portals. The findings enhance the understanding of e-government portals that senior citizens consider valuable and additionally, highlight the role of social influence in affecting their satisfaction and subsequently their continuous use intentions.

1 INTRODUCTION

Electronic government (e-government) initiative was first introduced in Malaysia in 2004 and it is enjoying a high rate of adoption. Information and communication technology (ICT) has become increasingly ubiquitous; and in view of that the research chooses to focus on expanding its breadth and depth by capitalising on the latest Web 2.0 applications and mobile technology. With Web 2.0 applications, users can perform real-time interactions with other users within their online communities. Active user behaviours such as the searching for information, evaluating alternatives, making online decisions, and sharing of experience, are influenced by how they perceive the value they gained from using those applications and others who they regard as important people. In the context of e-commerce, the role of perceived value and social influence in shaping consumer behaviour has been widely researched in the e-commerce context but similar studies on e-government services are relatively scarce. Moreover, existing literature on e-government in Malaysia is mostly about the assessment of e-government portals and factors affecting adoption or use intentions. A research on the how users perceive the benefits from using e-government portals and are affected by social influence may shed light on how e-government portals can be further enhanced. This study aims to investigate the level of satisfaction with services provided by e-government portals and to examine the effect of perceived value and social influence on satisfaction and continuous use intentions. Senior citizen, as a sample, is selected for two reasons. Firstly, Malaysia is moving toward having ageing population where senior citizens constituted 9.2% of the total population in 2015, and the figure is expected to reach 15% in year 2035. In 2050, 9.6 million of population (23.6%) is expected to be senior citizens (United Nations, 2015). These statistics have important implications for the government and other stakeholders in developing sustainable policies, which would address the needs of senior citizens in the country particularly in terms of their participations in economic, social, healthcare, and environmental activities.

Providing government services to senior citizens through e-government portals is one of the many important initiatives the government could take to encourage senior citizens' participation within the constraint of the limited resources. Therefore, it is considered timely to investigate the level of senior citizens' satisfaction with e-government portals as well as to examine the determinants and consequences of their satisfaction. In this study, data are collected from 123 senior citizens and analysed using Partial Least Squares Path Modelling (PLS-PM) technique.

The paper is structured as follows. The next section reviews the literature of citizen satisfaction with e-government services, and develops research hypotheses. Research methods about data collection, sampling procedures, and operationalisation of variables are then presented and that is followed by a report on research findings. The last section concludes the study by discussing research implications, limitations and recommendations for future research.

2 LITERATURE REVIEW

2.1 Satisfaction with E-Government Services

Prior research conducted on senior citizens' use of computers, Internet and online services were mainly focused on their adoption intentions, for instance, technology usage (Mitzner et al., 2010), health-related Internet and ICT (Heart and Kalderon, 2013; Wong et al., 2014), mobile phone (Conci, 2009), e-banking (Amma, 2013), and e-commerce (Law et al., 2016). Apart from Phang et al. (2006) who examined the e-withdrawal intention among senior citizens in Singapore, published literature on senior citizens' satisfaction with e-government services was limited. Consistent with prior technology acceptance research, they found that perceived usefulness and perceived ease of use were significant determinants of e-withdrawal intention. Besides, they also found that perceived Internet safety had an influence on acceptance of this online service.

The scholarly literature about e-government research in Malaysia is scarce. The existing literature examined the adoption intentions of e-government among citizens (Hussein et al., 2011; Mohd Suki and Ramayah, 2010; Ooh et al., 2009), challenges businesses face in implementation of e-government (Kaliannan and Awang, 2010; Aman and Kassimin, 2011), the adoption of electronic procurement systems among service providers to the government (Sambasivan, Wemyss, and Che Rose, 2010), and the intention to use multipurpose smartcard among citizens (Loo, Yeow, and Chong, 2009). Despite the fact that many prior studies had investigated factors affecting citizens' acceptance or adoption of e-government, few studies had clearly shown the relationships between different factors that influence citizen satisfaction with services offered by e-government portals. The only study focusing on user satisfaction with e-government systems was conducted by Mohamed et al. (2009) but the sample was limited to the employees of government departments instead of individual citizens at large. Furthermore, none of the research conducted in Malaysia focused on the level of satisfaction with e-government portals.

Prior research adopted the technology acceptance model (TAM), the theory of planned behaviour (TPB), and the diffusion of innovation (DOI) theory or combination of these theories to test the intention to use e-government services. Among the significant determinants found were trust, perceived usefulness, relative advantage, and perceived image (Ooh at al., 2009), and social norms (Mohd Suki and Ramayah, 2010). Sambasivan et al. (2010) reported that perceived usefulness, perceived ease of use, assurance of services, responsiveness of service providers, facilitating conditions, and web design (service quality) as the significant determinants of actual usage of e-procurement systems among services providers to the government.

Kalliannan and Awang (2010) examined the factors that influence the government suppliers' readiness in adopting and using e-procurement system. All three factors – organisational, technological, and environmental are found to strongly correlate with e-procurement usage. However, a regression analysis to examine which factor has a stronger impact on e-Procurement usage was not tested. On the other hand, Amin and Kassimin (2011) examined the implementation issues of e-procurement system in the government sector. These issues included challenges in terms of software integration, data management and roll-out strategy, legal and administration procedures, information technology (IT) infrastructure, outsourcing contract and IT skills.

As the research in individual-level IT adoption has become one of the most mature streams of IS research (Venkatesh, Davis, and Morris, 2007), this study differs from the prior studies by examining citizens' satisfaction with the services provided by e-

government portals and subsequent continuous use intentions in the context of senior citizens as users. This study posits that perceived value of using e-government portals and social influence lead to senior citizens' satisfaction, which in turn, influence their continuous use intentions.

2.2 Hypothesis Development

Perceived value or perceived benefits has been widely examined in the context of e-commerce (Anderson and Srinivasan, 2003; Chen and Dunbisky, 2003; Chiu et al., 2014). However, Scott, DeLone, and Golden (2016) was the only study focusing solely on the perceived benefits of e-government. Based on the public value theory, they conceptualised perceived value into three clusters – efficiency, effectiveness, and social value which were operationalised as having nine items including cost, time, personalization, communication, ease of information retrieval, trust, well-informedness, participation in decision-making, and convenience. The operationalisation provided a strong foundation for measuring the myriad dimensions of perceived value in the e-government setting.

On the other hand, Venkatesh et al. (2016) developed three factors in predicting the use intention of e-government and the subsequent satisfaction. The factors were information quality characteristics (accuracy and completeness), channel characteristics (convenience and personalization), and means of uncertainty reduction (transparency and trust). Besides information quality characteristics, the dimensions of the remaining two factors overlapped with that of Scott et al. (2016). Among the six items under the three factors, convenience was found to have the relatively strongest influence on the intention to use e-government services.

This study argues that senior citizen satisfaction is the result of their perception of value or benefits obtained from using services provided by e-government portals. We, therefore propose:

H$_1$: Perceived value relates positively with senior citizen satisfaction with the services provided by e-government portals.

Social influence or subjective norm refers to the degree to which individuals believe that people who are important to them think they should perform the behavior (Fishbein and Ajzen, 1975). Social influence has long been established as a significant determinant to technology and online services research such as intention to use information technology (Taylor and Todd, 1995), acceptance of

e-commerce services (Bhattacherjee, 2000), and adoption of m-commerce services (Wu and Wang, 2005). There are literature which examined the effects of social influence on e-government such as subjective norm and adoption intention of e-government services by Horst, Kuttschreuter, and Gutteling (2006), interpersonal influence and user acceptance of m-government services (Hung, Chang, Kuo, 2013). In the Malaysian context, Mohd Suki and Ramayah (2010) found a strong and positive influence of social norm on the intention to use e-government services.

Prior research on the relationship between social influence and satisfaction in the online environment is scarce. The most recent includes Al-Athmay, Fantazy, and Kumar (2016) which found a positive relationship between social influence and satisfaction of using e-government services in United Arab Emirates (UAE), and Chopra and Rajan (2016) which confirmed the relationship between social influence and salespersons' satisfaction of using point-of-sale machines mandated by the Chhattisgarh government in India. However, those two studies did not specifically argue the role of social influence on user satisfaction. On the other hand, Medina, Rufin, and Rey (2016) confirmed the relationship between expectation disconfirmation of social influence and satisfaction of using e-learning platform among students. This study argues that the influence exerted by the important people around an individual will lead to one's satisfaction with services provided by e-government portals. In the case of senior citizens, the influence important persons have upon their decision to use e-government portals enhances their satisfaction of using such portals. Therefore,

H$_2$: Social influence relates positively with senior citizen satisfaction with the services provided by e-government portals.

The concept of continuous use of e-government services can be rooted in the information systems (IS) continuous model by Saga and Zmud (1994) where the use of IS is discussed according to the phases of IS implementation in organisations. The first phase is acceptance where employees are committed to using the systems. The second phase is routinisation where the use of IS is integrated into work processes and employees continue using it as part of their work routines. The last phase is infusion where employees use the functions of IS deeply and comprehensively in their work routine. IS literature has generally agreed that the most successful IS implementations should include a higher level usage of IS features (Jasperson et al., 2005). A higher level

of IS usage behaviors can only be achieved if the systems have been fully integrated into the organisation and are used continuously by the users to accomplish their work tasks (Routinisation).

The literature in consumer behaviour stresses the importance of customer satisfaction in predicting repurchase behaviour (Anderson and Sullivan, 1993; Cronin et al., 2000). Similar findings had been confirmed in the online environment in terms of loyalty, repurchase intentions, or continuous use behaviours in the context of e-commerce (Tsai and Huang, 2007), m-commerce (Lin and Wang, 2006), e-learning (Roca, Chiu, and Martinez, 2006), and e-government (Chai et al., 2006).

As the use of e-government services or portals in Malaysia is not mandatory, dissatisfied senior citizens in the voluntary setting may opt to discontinue the use of e-government. On the contrary, satisfied senior citizens may continue to use e-government portals. Therefore,

H_3: Senior citizen satisfaction with the services provided by e-government portals relates positively with their continuous use intentions.

3 METHOD

3.1 Sample and Sampling Procedures

The target population of this research is Malaysian senior citizens aged 50 and above who are using e-government portals. The convenience sampling technique is used to approach and select respondents wherever the researchers can reach them conveniently. Two hundred individuals at the government departments and agencies in Kuala Lumpur and Penang are approached and briefed about the purpose of the survey before the age is obtained to ensure that only senior citizens are selected as the sample, of which, only 123 complete and usable responses are obtained, a response rate of 61.5%. In this survey, male respondents (72%) outnumber the female counterparts (28%). A majority of the respondents (80%) are aged between 50 to 59 years old and the remaining 20% are aged 60 and above. More than half of them (61%) possess an academic qualification of a Bachelor's degree or higher. Slightly over half (50.4%) of the respondents are still working and 27% of them are earning a monthly income of between RM2,001 and RM5,000. Over half of the respondents (62%) have access to the Internet all the time. The sample profile is presented in Table 1.

Table 1: Sample Profile (n=123).

Variable	Frequency	Percentage
Gender		
Male	89	72
Female	34	28
Age		
50 – 59	99	80
60 and above	24	20
Highest Educational Level		
Secondary	18	15
High School	13	11
Diploma	17	14
Bachelor's Degree	39	32
Master's Degree	27	22
Doctoral Degree	9	7
Occupation		
Office-based staff other than manager	18	15
Manager and equivalent	26	21
Non-office-based staff	1	1
Self-employed	17	14
Home maker	3	2
Retiree	34	28
Others	24	20
Monthly Income (RM)		
<= 2,000	25	20
2,001 – 5,000	33	27
5,001 – 8,000	23	19
8,001 – 10,000	16	13
>10,000	26	21
Accessibility to the Internet		
All the time	76	62
All the time during working hours	11	9
Half of working hours	10	8
Less than half of working hours	6	5
Only outside working hours	20	16

3.2 Variables and Measurement

Perceived Value. Perceived value is adapted by combining the public value net benefits model developed by Scott, DeLone, and Golden (2016) and the value cluster by Venkatesh et al. (2016). Eleven dimensions with 38 items are tested – cost, time, personalization, communication, ease of information retrieval, trust, well-informedness, participation in decision-making, convenience, completeness, and accuracy. All items are measured on the 7-point Likert scale from 1 – "strongly disagree" to 7 – "strongly agree".

Social Influence. Social influence is measured by three items adopted from Venkatesh and Morris, (2000) and used by Bhattacherjee (2015). The sample item includes "People who are important to me think that I should use e-government portals". All items are measured on the 7-point Likert scale from 1 – "strongly disagree" to 7 – "strongly agree".

Senior Citizen Satisfaction. Senior citizen satisfaction is measured using nine items adopted from Verdegem et al. (2009). The items include infrastructure, availability, awareness, cost, technical aspects, friendliness, privacy and security, content quality, and usability. All items are measured on the 7-point Likert scale from 1 – "very dissatisfied" to 7 – "very satisfied".

Continuous Use Intentions. The intentions to continue using the e-government portals is measured using four items adapted from Hausman and Siekpe (2009) and Li et al. (2006). All items are measured on the 7-point Likert scale from 1 – "strongly disagree" to 7 – "strongly agree".

Use of E-Government Portals. Respondents are asked to indicate the frequency of accessing the 20 listed government portals for the purposes of searching for information, performing transactions, downloading forms, participating in events, providing feedback, and sharing opinions based on the scale from 0 – "not at all / never", 1 – "rarely / occasionally", 2 – "often / frequently", and 3 – "always/ continuously".

Demographic Information. The questionnaire includes six demographic variables – gender, age, highest educational level, occupation, monthly income, and accessibility to the Internet.

4 RESULTS

This study utilizes Partial Least Squares Path Modelling (PLS-PM) with R (Sanchez, 2013) in data analysis and hypothesis testing. PLS-PM is a multivariate statistical technique that allows simultaneous evaluation between multiple variables and higher order factor (i.e., perceived value). PLS-PM involved two stages of analysis – evaluation of measurement model and structural model. The measurement model evaluates the reliability and validity of items and constructs while the structural model assesses effect size, direction, and significance of the hypothesized relationships.

4.1 Assessment of the Measurement Model

As shown in Table 2, all constructs are deemed reliable and valid as all scores exceed the acceptable thresholds of Cronbach's alpha, composite reliability, and average variance extracted (AVE) (Nunnally, 1978). The discriminant validity of the items is determined by comparing the squared roots of AVE and correlation coefficients between constructs. All the squared roots of AVE on the diagonal line score higher than the correlation coefficients between constructs, signifying discriminant validity at the construct level. All measures are found to have adequate convergent validity and discriminant validity at the item level as all the factor loadings score higher than 0.70 within the respective constructs – perceived value (0.72 - 0.91), social influence (0.97 - 0.98), citizen satisfaction (0.74 - 0.93), and continuous use intentions (0.94 - 0.97), and score lower on other constructs. The data analysis proceeds to evaluate the structural model after having met the requirements of reliability, convergent validity, and discriminant validity at both construct and item levels.

Table 2: Correlation Matrix.

Variable	M	SD	α	CR	1.	2.	3.	4.
1. PV	5.0	1.0	.95	.96	**.80**			
2. SI	4.4	1.4	.97	.98	.64	**.97**		
3. CS	4.4	1.2	.96	.96	.68	.58	**.86**	
4. CU	5.2	1.2	.97	.98	.76	.61	.60	**.95**

Note. PV – Perceived Value; SI – Social Influence; CS – Citizen Satisfaction; CU – Continuous Use Intentions; Diagonal values are squared root of AVE; α – Cronbach's alpha; CR – Composite reliability.

4.2 Assessment of the Structural Model

As presented in Figure 1, the structural model indicates that both perceived value and social influence are significantly related to senior citizen satisfaction with the services provided by e-government portals. However, the relationship between perceived value and senior citizen satisfaction ($\beta = .52$, $t = 6.15$, $p < .001$) is much stronger than the relationship with social influence ($\beta = .24$, $t = 2.87$, $p < .01$). Both perceived value and social influence explain almost half (49%) of the variance for senior citizen satisfaction ($R^2 = .49$). It is also found that satisfaction is positively and strongly related to continuous use intentions ($\beta = .60$, $t = 8.24$, $p < .001$). Senior citizen satisfaction explains 36% of the variance for continuous use

intentions (R^2 = .36). In sum, all the three hypotheses tested in this study are supported by the data.
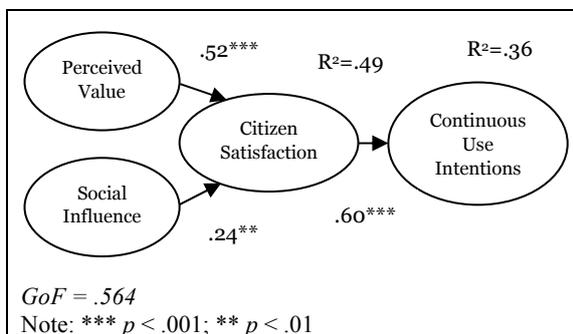
Figure 1: Structural Model.

4.3 Discussion

Generally, the senior citizens are moderately satisfied with the services provided by e-government portals (M=4.38) and have favourable continuous use intentions (M=5.20). Only a small percentage (below 25% across all portals but Inland Revenue Board portal) of the respondents quote that they frequently use e-government portals. Occasionally they use e-government portals which are related to health, police, tourism, and immigration. The study finds that perceived value is strongly and positively related to senior citizen satisfaction (Scott et al., 2016; Venkatesh et al., 2016). Similarly, social influence also leads to senior citizen satisfaction. The findings are consistent with Al-Athmay et al. (2016), Chopra and Rajan (2016), and Hsu and Chen (2007). Furthermore, this study finds that senior citizen satisfaction with the services provided by e-government portals relates positively and strongly with continuous use intentions. The strength of relationship between the two constructs is much stronger than the study by Chai et al. (2006).

5 IMPLICATIONS AND CONCLUSION

5.1 Implications for Research

Firstly, the study is one of the first empirical research to examine the satisfaction of senior citizens with e-government portals. Secondly, this study integrates the concept of perceived value of using e-government portals from Scott et al. (2016) and Venkatesh et al. (2016) and is supported by the empirical data. Thirdly, the study includes the concept of social influence as the determinant of senior citizen satisfaction with e-government portals and finds support for the argument. Finally, the study includes continuous use intention in the conceptual framework to provide greater comprehensiveness and criterion validity. The results provide empirical support for the proposed conceptual framework. Overall, the integration of perceived value and social influence to explain senior citizen satisfaction with e-government is the core theoretical contribution.

5.2 Implications for Practice

Senior citizen satisfaction is a manifestation of their experiences when using e-government portals and that depend on their perceptions of benefits they acquire from using those portals. The eleven dimensions of perceived value confirmed by this study show that government departments and agencies need to identify specific value dimensions which may enhance senior citizens' satisfaction and increase their continuous use intentions. By providing complete, accurate, and up-to-date information about the services on the e-government portals, respective government departments and agencies would allow senior citizens to be better informed on current news and events, new functionalities, and latest development. Besides, in designing e-government portals and their complementary human-computer interactive features that are efficient, effective and have social value, one needs to identify important value dimensions.

Government departments and agencies must be aware of the needs and expectations of senior citizens from using e-government portals. With the projection of population ageing by 2035, Malaysian government anticipates an increase in the use of e-government portals among the senior citizens who have higher Internet access and are more interested and competent in using online services. In view of that, e-government portals should be enhanced with more advanced functionalities in order to meet the needs of this group of users.

Besides, awareness campaigns to enhance the use of e-government portals among senior citizens should be conducted regularly especially after new functionalities are introduced. Younger users who are the family members, friends and peers in workplace should actively promote the use of e-government portals amongst senior citizens by providing the necessary assistance. The significant effect exhibited by social influence in this study

implies that the important individuals surrounding the senior citizens could play an important role in enhancing their satisfaction with e-government portals.

5.3 Limitations and Recommendations for Future Research

This study suffers from a number of limitations and further research in this area is recommended.

Firstly, the sample is relatively small (n=123) and selected using convenience sampling procedure. As such, the results may not be generalisable to the population. The responses of every variable under investigation depend largely on the sample characteristics. To improve the external validity of the research, future researchers are recommended to identify a group of homogeneous senior citizens, for instance, retirees, home makers, working or senior citizens with low income and with low educational qualifications.

Secondly, this study employs a cross-sectional design and thus it is difficult to establish causal relationship among the constructs. Future researchers may consider using a longitudinal design to collect data from the same group of respondents over multiple periods of time. Alternatively, an experiment design is considered to be more appropriate if establishing causal relationships is crucial in the study. Face-to-face interviews can be a better approach to collecting data from senior citizens.

Thirdly, no specific e-government services and portals is referred to in the survey questionnaire as by doing so could have taxed the memory of the respondents who might have different perceptions of benefits obtained from different e-government portals as well as their satisfaction level of using these portals. As such, respondents may find it difficult to relate their responses to the use of e-government portals. Future researchers may identify and test a specific e-government service or portal with the associated benefits.

6 CONCLUSION

The study proposes and tests a conceptual framework with two determinants and a consequence of satisfaction with e-government portals in the context of senior citizens. Based on the results of a survey of 123 senior citizens, this study finds support for the proposed conceptual framework which hypothesises that perceived value and social influence affect senior citizens' satisfaction, which in turn, influence their continuous use intentions of e-government portals. This proposed conceptual framework can serve as a starting point for pursuing future research into specific e-government services or portals in Malaysia and in other countries with ageing population.

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