

Association for Information Systems AIS Electronic Library (AISeL)

PACIS 2017 Proceedings

Pacific Asia Conference on Information Systems
(PACIS)

Summer 2017

Continuous Use and Extended Use of E-Government Portals

Ching Seng Yap

Updated - AIS, yapchingseng@curtin.edu.my

Rizal Ahmad

Universiti Tun Abdul Razak, rizal@unirazak.edu.my

Farhana Tahmida Newaz

Universiti Tun Abdul Razak, farhana@unirazak.edu.my

Cordelia Mason

Independent Researcher, cordeliamason65@gmail.com

Follow this and additional works at: <http://aisel.aisnet.org/pacis2017>

Recommended Citation

Yap, Ching Seng; Ahmad, Rizal; Newaz, Farhana Tahmida; and Mason, Cordelia, "Continuous Use and Extended Use of E-Government Portals" (2017). *PACIS 2017 Proceedings*. 107.

<http://aisel.aisnet.org/pacis2017/107>

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2017 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Continuous Use and Extended Use of E-Government Portals

Completed Research Paper

¹Ching Seng Yap
Curtin University Malaysia
yapchingseng@curtin.edu.my

²Rizal Ahmad
Universiti Tun Abdul Razak
rizal@unirazak.edu.my

³Farhana Tahmida Newaz
Universiti Tun Abdul Razak
farhana@unirazak.edu.my

⁴Cordelia Mason
Independent Researcher
cordeliamason65@gmail.com

Abstract

This study aims to investigate the level of user satisfaction with the services provided by e-government portals and to examine the influence of perceived value and virtual community engagement on citizens' satisfaction and their continuous and extended use intentions. Primary data were collected from 409 users of e-government portals via a questionnaire survey. The findings show that citizens are generally satisfied with the services provided by e-government portals and have positive continuous use and extended use intentions. The actual usage is more prevalent among educational, banking and finance, and taxation related portals. Both perceived value and virtual community engagement relate positively with citizen satisfaction, with the former has a relatively stronger influence. Citizen satisfaction also leads to continuous and extended use intentions. The findings shed lights on dimensions of e-government portals that citizens considered valuable and the importance of the formation of virtual communities in influencing their satisfaction and subsequent use intentions.

Keywords: e-government portals; e-government services; perceived value; virtual community engagement; citizen satisfaction; continuous use intention; extended use intention; Malaysia.

Introduction

The adoption rate of the electronic government (e-government) initiative in Malaysia has been growing rapidly since it was first introduced in 2004 due to the ubiquity of the Internet and mobile services; now, the focus will be on expanding its breadth and depth by capitalising on the latest Web 2.0 and mobile technology. With Web 2.0 applications, users can perform real-time interactions with other users within their virtual communities. Active user behaviours such as the searching for information, evaluating alternatives, making online decisions, and sharing of experience, are influenced by their perceived value and other members within their virtual communities, which lead to online purchases. The role of perceived value and virtual communities in shaping consumer behaviour has been widely researched in the marketing context but the 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 users' engagement in virtual communities will benefit the government, especially on its online services, in understanding the role of perceived value and virtual communities play in increasing the use of e-government portals among citizens. This study aims to investigate the level of citizen satisfaction with e-government portals and to examine the influence of perceived value and virtual community engagement on citizen satisfaction and their continuous and extended use intentions.

Despite the fact that many prior studies have investigated the factors affecting citizens' acceptance or adoption of e-government, few studies have clearly shown the relationships between different factors that influence citizen satisfaction with services offered by e-government portals. In the context of e-government research in Malaysia, most studies focused on user acceptance of (e.g., Norazah & Ramayah, 2010) or intention to use (e.g., Hussein et al., 2011; Ooh et al., 2009) e-government. The

only study focusing on user satisfaction with e-government systems was conducted by Mohamed et al. (2009) but the sample was the employees working in the government departments instead of the general public. Therefore, it is timely to investigate the level of citizen satisfaction with e-government as well as to examine the determinants and consequences of citizen satisfaction after the first e-government initiatives have been introduced for over a decade.

The paper is structured as follows. Next section reviews the development of e-government in Malaysia and 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.

Literature Review

Development of E-Government in Malaysia

E-government was initiated in Malaysia on 24 February 2004 to help enhance the public delivery system through the Internet and World Wide Web technology. Under one of the seven flagships of Multimedia Super Corridor (MSC) launched in 1997, the e-government initiative consists of seven pilot projects – Generic Office Environment (GOE), Electronic Procurement (EP), Human Resource Management Information System (HRMIS), Project Monitoring System (PMS), Electronic Services Delivery (EServices), Electronic Labor Exchange (ELX), and E-Syariah.

The 2011 Government E-Payment Adoption Rate (GEAR 2011) published by the Economist Intelligence Unit shows that Malaysia is ranked 29th out of 62 countries with an overall performance score of 69.3%. Besides, the United Nations E-Government Survey 2014 Report indicates that Malaysia is ranked the 52nd out of 193 in the E-Government Development Index, and the 59th in the E-Participation Index, the lowest ranking since the Index was introduced in 2003. The indices and rankings indicate that Malaysia needs to identify areas for improvement in the development and implementation of e-government in order to narrow the gap with other countries in the world.

Multimedia Digital Economy Corporation (MDEC) in 2013 published an assessment report about e-government portals and websites. The assessment criteria include content, usability, security, participation and services. The report concluded that e-government portals and websites have improved their quality, with over 90% of portals and websites being rated 3-Star and above, the first time since the annual exercise took place in 2005. It is thus interesting to verify the report by examining the level of citizen satisfaction with e-government portals.

E-Government Research in Malaysia

The scholarly literature about e-government research in Malaysia is scarce. The existing literature examined factor affecting the adoption intentions of e-government among citizens (Ooh et al., 2009; Norazah & Ramayah, 2010) or challenges businesses face in implementation of e-government (Kalliannan & Awang, 2010; Aman & Kassimin, 2011).

Ooh et al. (2009) examined the factors influencing the intention to use e-government services among citizens in Malaysia. Using the integrated model from technology acceptance model (TAM) and diffusion of innovation (DOI) theory, they found that trust, perceived usefulness, relative advantage and perceived image are positively related to intention to use e-government services. On the contrary, perceived complexity has an adverse effect. Perceived strength of online privacy and non-repudiation are found to be the predictors of citizen's trust to use e-government services.

Norazah and Ramayah (2010) used the TAM and theory of planned behavior (TPB) to test the acceptance of e-government services among the citizens. Similar to Ooh et al.'s (2009) study, all antecedents of TAM were found to be significant predictors of attitude toward e-government services. Both social norms and attitude are positively related to intention to use e-government services.

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, & Morris, 2007), this study differs from the prior studies by examining citizen satisfaction with the services provided by e-government portals and subsequent continuous and extended use intentions. This study argued that perceived value of using e-government portals and engagement in virtual communities lead to citizens' satisfaction, which in turn, influence their continuous and extended use intentions.

Perceived Value

Perceived value or benefits has been widely examined in the context of e-commerce (Anderson & Srinivasan, 2003; Chen & Dunbisky, 2003; Chiu et al., 2014). However, Scott, DeLone, and Golden (2016) is the only study focusing solely on the perceived benefits of e-government using the public value theory, encompassing three value clusters – efficiency, effectiveness, and social value. Based on the three value clusters, they developed and validated nine-factor structure, including cost, time, personalization, communication, ease of information retrieval, trust, well-informedness, participation in decision-making, and convenience. Even though the study did not relate perceived value with any antecedents and consequences in the e-government context, it provides a strong foundation for measuring the multiple dimensions of the concept of perceived value.

Venkatesh et al. (2016) developed a model from three perspectives in predicting the use intention of e-government and the subsequent satisfaction. The three factors are information quality characteristics (accuracy and completeness), channel characteristics (convenience and personalization), and means of uncertainty reduction (transparency and trust). Apart from the information quality characteristics, the dimensions of the remaining two perspectives overlap with the study of Scott et al. (2016). Among the six items under the three perspectives, convenience item has the relatively strongest influence on the use intention of e-government.

Hsu and Chen (2007) found that functional value positively and strongly related to user satisfaction of using information systems (IS) in the government sector. On the other hand, social value and conditional value have relatively weaker influence on user satisfaction. Nevertheless, the sample of this study consists of employees working in the government sector.

This study argued that citizen satisfaction is the result of the perception of value or net benefits obtained from using the services offered by e-government portals. Therefore,

H₁: Perceived value relates positively with user satisfaction with the services provided by e-government portals.

Engagement in Virtual Communities

Virtual communities is defined as affiliative groups whose online interactions are based upon shared enthusiasm for, and knowledge of, a specific consumption activity or related group of activities (Kozinets, 1999). Virtual communities can be seen as word-of-mouth networks consisting of multiple individuals who are both contributors and receivers exchanging information, ideas, opinions, comments, and experience. The main form of online word-of-mouth is online product review by consumers. Other relevant terms include online community, electronic community, and computer-supported collaborator network, which are sometime used interchangeably.

Engagement in virtual community has been found to have a positive influence on purchasing behavior in the e-commerce setting (Chou & Sawang, 2015; Huang, Kim, & Kim, 2013; Kim, Kim, & Huang, 2014). However, the research specifically dedicated to the role of virtual communities in e-government portals is scarce. Most studies in the literature focus on the presence of Web 2.0 technology in e-government portals and its association with user engagement.

Stefanick and LeSage (2005) was one of the first studies dedicated to virtual communities in public sector. Based on a case study called 'MuniMall' project in Canada, the study identified the limitations

to developing virtual communities for practitioners in a local government. The study found that the culture of the professional population is important in the development of virtual community. Opinion leader can act as an anti-change agent who hinders others from engaging in the community. However, communication systems can both promote and discourage open engagement in a virtual community. Besides, the website design and the service components are more important than brand recognition and technicality in enhancing engagement among practitioners in the community. It is to highlight that the study focused on practitioners in the public sector and excluded interactions between citizens and businesses with the government.

Chua, Goh, and Ang (2002) found that Web 2.0 applications are prevalent in government websites and have positive correlation with perceived quality of government website. One hundred government websites from both developed and developing countries were observed and content analysed. It was found that the prevalence of seven Web 2.0 applications in descending order was RSS, multimedia sharing services, blogs, forums, social tagging, social networking and wikis. The presence of Web 2.0 application government websites was associated with perceived service quality.

Bonson, Royo, and Ratkai (2015) examined the impact of media and content types on citizens' engagement on 75 local governments' Facebook sites of 15 Western European countries. Significant differences in the level of engagement by citizens are found in different countries, specifically the Nordic and Southern European local government have the most engaged citizens on average, Anglo-Saxon local governments have the highest commitment metric (to comment on posts). In terms of the effects of different media types on citizen engagement, pictures elicit the higher level, followed by text. Besides, the general pattern of liking (popularity) is a much more common engagement type, than commenting (commitment), or sharing (virality) of posts.

The existing literature has not offered any discussion on the direct relationship between engagement in virtual communities and satisfaction with e-governments. This study argued that citizens, who actively engage in virtual community activities such as discussion, sharing of experiences, asking and answering questions, are more likely to gain satisfaction with the services provided by e-government portals. Therefore,

H₂: Active engagement in virtual communities relates positively with user satisfaction with the services provided by e-government portals.

Continuous Use and Extended Use

The literature of continuous use and extended use has been established in the literature of post-adoption of information systems (IS) (Hsieh & Wang, 2007). However, the similar topic in e-government research is relatively scarce. The concepts of continuous use and extended use of e-government can be rooted in the IS continuous model by Saga and Zmud (1994) where the use of IS is discussed according to the phases of IS implementation. The first phase is acceptance where employees are committed to use 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 after the systems have been fully integrated into the organisation and are used continuously by the users to accomplish their work tasks (Routinisation). Extended use is not likely to happen easily unless the users of the systems proactively engage in changing work habits, routines, and the IS itself to achieve higher level of usage behavior to complete more sophisticated work tasks (Infusion).

The review of literature reveals that extended usage of IS possesses three characteristics. Firstly, more and different features are explored and used to support work tasks (Hsieh & Wang, 2007, Jasperson et al., 2005). Secondly, new and innovative manner is discovered and exploited to use the systems (Ke et al., 2012). Lastly, the use behavior is not mandated by organisation to perform work tasks but it goes beyond the routine usage of the systems (Jasperson et al. 2005). Similar terms include exploratory use, innovative use, adaptive use, emergent use, integrative use, exploitive use, and deep use (Hsieh & Wang 2007, Li et al., 2013, Ke et al., 2012). These characteristics lead to the definition of extended use in this study as "the use of more and different features or functionalities of e-government portals".

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

As the use of e-government services or portals in Malaysia is not mandatory, dissatisfied citizens in the voluntary setting may opt to discontinue the use of e-government. On the contrary, satisfied citizens may not only continue to use e-government but also tend to explore new features and use it more frequently and deeply. Therefore,

H₃: Citizen satisfaction relates positively with continuous use intention.

H₄: Citizen satisfaction relates positively with extended use intention.

H₅: Continuous use intention relates positively with extended use intention of e-government portals.

In sum, Web 2.0 applications provide the underlying platforms necessary to encourage users' engagement and participation in the virtual communities which potentially lead to their satisfaction and continuous usage of e-government portals. The current scholarly literature about the role of virtual communities in enhancing the use in e-government is relatively scarce as compared to the context of marketing in commercial settings. It is therefore important and timely to investigate the influence of virtual communities in predicting citizens' satisfaction and subsequently their continuous and extended use intentions of e-government portals.

Method

Sample and Sampling Procedures

The target population of this research is Malaysian citizens who use e-government portals. The convenience sampling technique was used as it involves getting respondents wherever the researchers can reach them conveniently. Five hundred individuals at the government departments and agencies in Kuala Lumpur and Penang were approached and 409 complete and usable responses were obtained, a response rate of 82%. In this survey, female respondents (55%) outnumber the male counterparts (45%). Slightly over half of the respondents are aged below 30 years old and possess a bachelor's degree or its equivalent. A third of them are non-manager office-based staff earning a monthly income of between RM2,001 and RM5,000. A big majority of the respondents (78%) have access to the Internet all the time. The details of sample characteristics are presented in Table 1.

Variables and Measurement

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

Virtual Community Engagement. Engagement in virtual community was adapted from Nambisan and Baron (2009) and Wang et al. (2012). Respondents were asked to indicate their level of agreement on five items about their engagement in an active virtual community in terms of providing feedback, receiving responses, participating in discussion, offering assistance, and sharing of experiences and feelings. All items were measured on the 7-point Likert scale from 1 – “strongly disagree” to 7 – “strongly agree”.

Citizen Satisfaction. Citizen satisfaction consists of 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 were measured on the 7-point Likert scale from 1 – “very dissatisfied” to 7 – “very satisfied”.

Continuous Use Intention. The intention to continue using the e-government portals was operationalised as having four items and was adapted from Hausman and Siekpe (2009) and Li et al.

(2006). All items were measured on the 7-point Likert scale from 1 – “strongly disagree” to 7 – “strongly agree”.

Extended Use Intention. The extended use intention consists of three items adapted from Schwarz (2003). All items were measured on the 7-point Likert scale from 1 – “strongly disagree” to 7 – “strongly agree”.

Use of E-Government Portals. The use of e-government portals is measured by 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 / frequent”, and 3 – “always / continuously”.

Demographic Information. Six demographic variables are included in the questionnaire, such as gender, age, highest educational level, monthly income, among others.

Table 1: Sample Characteristics (n=409)		
Variable	Frequency	Percentage
<i>Gender</i>		
Male	182	45.0
Female	222	55.0
<i>Age</i>		
21 – 29	214	52.8
30 – 39	112	27.7
40 – 49	55	13.6
50 – 59	21	5.2
60 and above	3	0.7
<i>Highest Educational Level</i>		
Secondary	25	6.1
High School	23	5.7
Diploma	81	19.9
Bachelor’s Degree / Professional Certification	205	50.4
Master’s Degree	58	14.3
Doctoral Degree	15	3.7
<i>Occupation</i>		
Students	122	30.0
Office-based staff other than manager	138	33.9
Manager and equivalent	51	12.5
Non-office-based staff	23	5.7
Self-employed	34	8.4
Home maker	6	1.5
Retiree	4	1.0
Others	29	7.1
<i>Monthly Income (RM)</i>		
<= 2,000	151	37.8
2,001 – 5,000	160	40.0
5,001 – 8,000	56	14.0
8,001 – 10,000	21	5.3
>10,000	12	3.0
<i>Accessibility to the Internet</i>		
All the time	316	77.6
All the time during working hours	37	9.1
Half of working hours	21	5.5
Less than half of working hours	9	2.2
Only outside working hours	24	5.9

Results

Partial least squares path modeling (PLS-PM) with R (Sanchez, 2013) was used in data analysis and hypothesis testing. PLS-PM is a multivariate statistical technique that allows simultaneous evaluation between multiple variables. PLS-PM involved two stages of analysis – evaluation of measurement model and structural model. The measurement model evaluates the reliability and validity of the items and constructs while the structural model assessed the effect size, direction, and significance of the hypothesized relationships.

Assessment of the Measurement Model

As shown in Table 2, all constructs were deemed reliable and valid as all scores exceeded the acceptable thresholds of Cronbach's alpha, composite reliability, and average variance extracted (AVE) (Nunally, 1978). The discriminant validity of the items was determined by comparing the squared roots of AVE and correlation coefficients between constructs. All the squared roots of AVE on the diagonal line are higher than the correlation coefficients between constructs, signifying discriminant validity at the construct level. All items were found to have adequate convergent validity and discriminant validity at the item level as all the factor loadings were loaded higher than 0.60 within the respective constructs – perceived value (0.64 - 0.88), virtual community engagement (0.80 - 0.89), citizen satisfaction (0.79 - 0.89), continuous use intention (0.92 - 0.97), and extended use intention (0.95 - 0.96), and loaded low across other constructs. Having met the requirements of reliability, convergent validity, and discriminant validity at both construct and item levels, the data analysis proceeds to evaluate the structural model.

Variable	M	SD	α	CR	1.	2.	3.	4.	5.
1. Perceived Value	4.92	0.98	.94	.95	.79				
2. Virtual Community	4.33	1.24	.90	.93	.61	.85			
3. Citizen Satisfaction	4.54	1.25	.95	.96	.74	.59	.85		
4. Continuous Use	5.11	1.34	.96	.97	.71	.47	.64	.95	
5. Extended Use	5.03	1.34	.96	.97	.70	.46	.65	.87	.96

Note. Diagonal values are squared root of AVE; α – Cronbach's alpha; CR – Composite reliability.

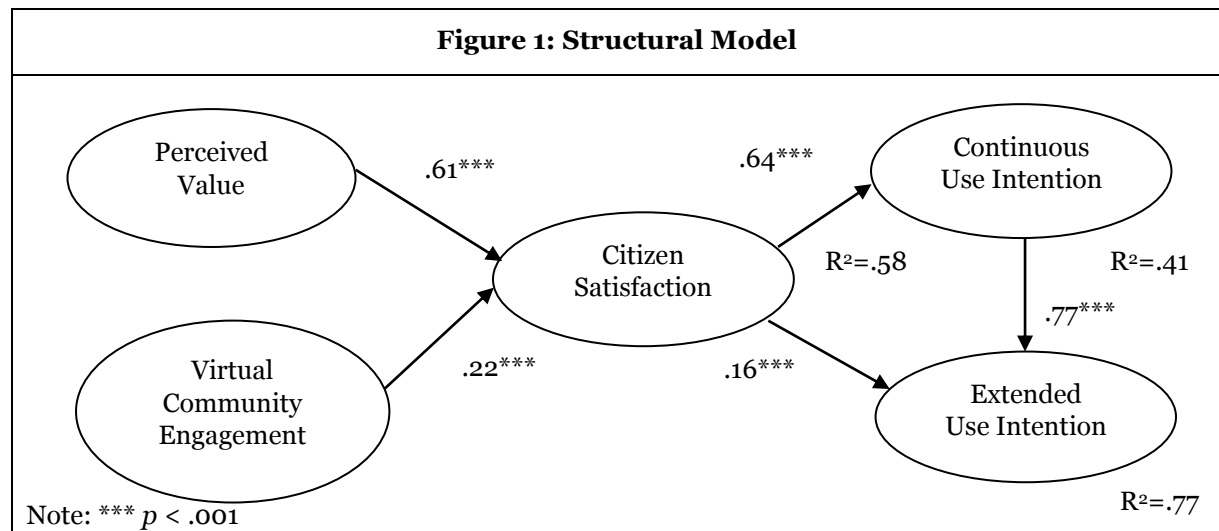
Assessment of the Structural Model

The structural model as presented in Figure 1 shows that both perceived value and virtual community engagement are significantly related to citizen satisfaction with the services offered by e-government portals. However, the relationship between perceived value and citizen satisfaction ($\beta = .61, t = 14.00, p < .001$) is much stronger than the relationship between virtual community and citizen satisfaction ($\beta = .22, t = 5.13, p < .001$). Both perceived value and virtual community engagement explain slightly over half of the variance for citizen satisfaction ($R^2 = .58$). It is also found that user satisfaction is positively and strongly related to continuous use intention ($\beta = .64, t = 15.90, p < .001$), but its relationship with extended use intention is relatively weak ($\beta = .16, t = 4.82, p < .001$). A further analysis reveals that the indirect effect of citizen satisfaction on extended use intention through continuous use intention is not only significant ($\beta = .49$) but also larger than its direct effect. As expected, the relationship between continuous use intention and extended use intention is significant and strong ($\beta = .77, t = 23.40, p < .001$). Both continuous use intention and user satisfaction explain 77% of the variance for extended use intention. In sum, all the hypotheses tested are supported by the data.

Discussion

Generally, the respondents were satisfied with the services provided by e-government portals ($M=4.54$) and had positive continuous use ($M=5.11$) and extended use ($M=5.03$) intentions. The frequently used e-government portals are related to education, banking and finance, and taxation services. The study found that perceived value was strongly and positively related to citizen satisfaction. Similarly, active engagement in virtual communities also led to citizen satisfaction. The findings were consistent with Hsu and Chen (2007). Furthermore, this study found that citizen satisfaction with the services offered by e-government portals related positively and strongly with continuous use intention. The strength of relationship between the two constructs was much stronger than the study by Chai et al. (2006). The

relationship between continuous use intention and extended use intention was strong and positive, in line with the study of Hsieh and Wang (2007).



Implications and Conclusion

Implications for Research

Firstly, the study integrated the concept of perceived value of using e-government services from Scott et al. (2016) and Venkatesh et al. (2016) and was supported by the empirical data. Secondly, the study introduced the concept of engagement in virtual community as the determinant of citizen satisfaction with services provided by e-government portals and found support for the argument. Thirdly, the study included continuous use intention and extended use intention in the conceptual framework to provide greater comprehensiveness and criterion validity. The results provided empirical support for the proposed conceptual framework. The proposed conceptual framework also confirmed the role of citizen satisfaction on the relationship between perceived value, virtual community engagement and post-usage behaviour of e-government portals. Overall, the integration of perceived value and virtual community engagement to explain citizen satisfaction with e-government is the core theoretical contribution.

Implications for Practice

Citizen satisfaction is a manifestation of their experiences when using e-government portals and that depend on their perceptions of net benefits they get from using those portals. The eleven dimensions of perceived value confirmed by this study show that government departments and agencies need to identify specific dimensions of factors which may enhance citizen satisfaction and increase continuous and extended use intentions. By providing complete, accurate, and up-to-date information about the services on the e-government portals, respective government departments would allow citizens to be better informed on current news and events. 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.

In addition, the government should foster engagement of citizens in various virtual communities. With the advancement of Web 2.0 applications such as blogs, forums, and social networking sites, virtual communities can be easily initiated by providing platforms for citizens to interact or communicate including to express their doubts, raise queries, provide feedback, share experiences, and express their feelings to other users about their perceptions of services obtained through e-government portals. Through active engagement in virtual communities, citizens create new knowledge and learn from one another which would enhance their satisfaction and utilisation of e-government portals.

Limitations and Recommendations for Future Research

This study is not without a number of limitations and further research in this area is recommended.

Firstly, the sample was selected using convenience sampling procedure and the results may not be generalisable to the population. The responses of every variable under investigation depended largely on the sample characteristics. To improve the external validity of the research, future researchers are recommended to identify a group of homogeneous respondents, for instance, retirees, home makers, or university students.

Secondly, this study employed a cross-sectional design and thus it was 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.

Thirdly, no specific e-government services and portals was referred to in the survey questionnaire which taxed the memory of the respondents who may have different perceptions of benefits obtained from different e-government portals as well as their satisfaction level of using the portals. Similarly, engagement in virtual community was not based on a particular e-government portal. 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 virtual community.

Conclusion

The study presented a conceptual framework with two determinants and two consequences of citizen satisfaction with e-government portals. Based on the results of a survey of 409 citizens, this study found support for the proposed conceptual framework. Perceived value and engagement in virtual community positively affect citizen satisfaction, which in turn, influence continuous use and extended use intentions of e-government portals. This proposed conceptual framework can serve as a starting block for pursuing future inquiries into specific e-government services/portals in Malaysia and beyond.

Acknowledgements

The research project is funded by the Fundamental Research Grant Scheme (FRGS), Ministry of Higher Education, Malaysia (FRGS/1/2015/SS01/UNIRAZAK/02/2).

References

- Aman, A., and Kassimin, H. 2011. "E-Procurement Implementation: A Case of Malaysia government," *Transforming Government: People, Process and Policy* (5:4), pp. 330-344.
- Anderson, R.E., and Srinivasan, S.S. 2003. "E-Satisfaction and E-Loyalty: A Contingency Framework," *Psychology & Marketing* (20:2), pp. 123-138.
- Anderson, E.W., and Sullivan, M.W. 1993. "The Antecedents and Consequences of Customer Satisfaction for Firms," *Marketing Science* (12:2), pp. 125-143.
- Bonson, E., Royo, S., and Ratkai, M. 2015. "Citizens' Engagement on Local Governments' Facebook Sites. An Empirical Analysis: The Impact of Different Media and Content Types in Western Europe," *Government Information Quarterly* (32:1), pp. 52-62.
- Chai, S., Herath, T.C., Park, I., and Rao, H.R. 2006. "Repeated Use of E-Gov Web Sites: A Satisfaction and Confidentiality Perspective," *International Journal of Electronic Government Research* (2:3), pp. 1-22.
- Chen, Z., and Dubinsky, A.J. 2003. "A Conceptual Model of Perceived Customer Value in E-Commerce: A Preliminary Investigation," *Psychology & Marketing* (20:4), pp. 323-347.
- Chiu, C.-M., Wang, E.T.G., Fang, Y.-H., and Huang, H.-Y. 2014. "Understanding Customers' Repeat Purchase Intentions in B2C E-Commerce: The Roles of Utilitarian Value, Hedonic Value and Perceived Risk," *Information Systems Journal* (24:1), pp. 85-114.

- Chou, C. Y., and Sawang, S. 2015. "Virtual Community, Purchasing Behaviour, and Emotional Well-Being," *Australasian Marketing Journal* (23:3), pp. 207-217.
- Chua, A. Y. K., Goh, D. H., and Ang, R. P. 2012. "Web 2.0 Applications in Government Web Sites," *Online Information Review* (36:2), pp. 175-195.
- Cronin, J.J., Brady, M.K., and Hult, G.T.M. 2000. "Assessing the Effects of Quality, Value, and Consumer Satisfaction on Consumer Behavioral Intentions in Service Environments," *Journal of Retailing* (76:2), pp. 193-218.
- GEAR 2011. "Government E-Payments Adoption Ranking", (<http://graphics.eiu.com/upload/eb/Visapayments.pdf>)
- Hausman, A.V., and Siekpe, J. S. 2009. "The Effect of Web Interface Features on Consumer Online Purchase Intentions," *Journal of Business Research* (62:1), pp. 5-13.
- Hsieh, J.J.P.A., and Wang, W. 2007. "Explaining Employees' Extended Use of Complex Information Systems," *European Journal of Information Systems* (16:3), pp. 216-227.
- Huang, R., Kim, H., and Kim, J. 2013. "Social Capital in QQ China: Impacts on Virtual Engagement of Information Seeking, Interaction Sharing, Knowledge Creating, and Purchasing Intention," *Journal of Marketing Management* (29:3-4), pp. 292-316.
- Hussein, R., Mohamed, N., Ahlan, A. R., Mahmud, M., and Aditiawarman, U. 2010. "G2C Adoption of E-Government in Malaysia: Trust, Perceived Risk and Political Self-Efficacy," *International Journal of Electronic Government Research* (6:3), pp. 57-72.
- Jasperson, J. S, Carter, P. R., and Zmud, R. W. 2005. "A Comprehensive Conceptualization of Post-Adoptive Behaviors Associated with Information Technology Enabled Work Systems," *MIS Quarterly* (29:3), pp. 525-557.
- Kaliannan, M., and Awang, H. 2010. "Adoption and Use of E-Government Services: A Case Study on E-Procurement in Malaysia," *WSEAS Transactions on Business and Economics*, pp. 88-93.
- Ke, W., Tan, C.-H., Sia, C.-L., and Wei, K.-K. 2012. "Inducing Intrinsic Motivation to Explore the Enterprise System: The Supremacy of Organizational Levers. *Journal of Management Information Systems* (29:3), pp. 257-290.
- Kim, H., Kim, J., and Huang, R., 2014. "Social Capital in the Chinese Virtual Community: Impacts on the Social Shopping Model for Social Media", *Global Economic Review* (43:1), pp. 3-24.
- Kozinets, R. K. 1999. "E-Tribalized Marketing? The Strategic Implications of Virtual Communities of Consumption," *European Management Journal* (17:3), pp. 252-264.
- Li, D., Browne, G.L, and Wetherbe, J.C. 2006. "Why Do Internet Users Stick with A Specific Web Site? A Relationship Perspective," *International Journal of Electronic Commerce* (10:4), pp. 105-141.
- Li, X., Hsieh, J.J.P.A., and Rai, A. 2013. "Motivational Differences across Post-Acceptance Information System Usage Behaviors: An Investigation in the Business Intelligence Systems Context. *Information Systems Research* (24:3), 659-682.
- Ooh, K. L., Zailani, S., Ramayah, T., and Fernando, Y. 2009. "Factors Influencing Intention to Use E-Government Services among Citizens in Malaysia," *International Journal of Information Management* (29:6), pp. 458-475
- Nambisan, S., and Baron, R.A. 2009. "Virtual Customer Environments: Testing A Model of Voluntary Participation in Value Co-Creation Activities," *Journal of Production Innovation Management* (26:4), pp. 388-406.
- Norazah, M.S., and Ramayah, T. 2010. "User Acceptance of the E-Government Services in Malaysia: Structural Equation Modelling Approach," *Interdisciplinary Journal of Information, Knowledge, and Management* (5).
- Nunnally, J. 1978. *Psychometric Methods*, New York: McGraw-Hill.
- Saga, V., and Zmud, R.W. 1994. "The Nature and Determinants of IT Acceptance, Routinization and Infusion," *Proceedings of the International Federation of Information Processing Work Group.8* (6), pp. 67-86.
- Sanchez, G. 2013. "PLS Path Modeling with R", (<http://gastonsanchez.com>)
- Schwaz, A. 2003. *Defining Information Technology Acceptance: A Human-Centered, Management-Oriented Perspective*. PhD Thesis. University of Houston-University Park.
- Scott, M., DeLone, W., and Golden, W. 2016. "Measuring eGovernment Success: A Public Value Approach," *European Journal of Information Systems* (25:3), pp. 187-208.
- Stefanick, L., and LeSage, E. 2005. "Limitations to Developing Virtual Communities in the Public Sector: A Local Government Case Study," *Canadian Public Administration* (48:2), pp. 231-250.
- Venkatesh, V., Davis, F.D., and Morris, M.G. 2007. "Dead or Alive? The Development, Trajectory and Future of Technology Adoption Research," *Journal of the Association for Information Systems* (8:4), pp. 267-286.

- Venkatesh, V., Thong, J.Y.L., Chan, F.K.Y., and Hu, P.J.H. 2016. "Managing Citizens' Uncertainty in E-Government Services: The Mediating and Moderating Roles of Transparency and Trust," *Information Systems Research* (27:1), pp. 87-111.
- Verdegem, P., and Verleye, G. 2009. "User-centered E-Government in Practice: A Comprehensive Model for Measuring User Satisfaction," *Government Information Quarterly* (26:3), pp. 487-497.
- Wang, Y., Shi, J., Ma, S., Shi, G., & Yan, L. 2012. "Customer Interactions in Virtual Brand Communities: Evidence from China," *Journal of Global Information Technology Management* (15:2), pp. 46-69.