

The linkage between information quality and e-government adoption: is gender a moderating factor?

Fahmi Zaidi Bin Abdul Razak*

Research and Innovation Department,
Sultan Ahmad Shah Pahang
Islamic University College (KUIPSAS), Malaysia
Email: fahmizaidi@kuipsas.edu.my
*Corresponding author

Azlina Abu Bakar

Faculty of Education and Human Development,
University Pendidikan Sultan Idris,
35900 Tanjong Malim,
Perak Darul Ridzuan, Malaysia
Email: azlina.ab@fpm.upsi.edu.my

Wan Salihin Wong Abdullah

Center for Quality Assurance and Accreditation,
Universiti Malaysia Kelantan,
Karung Berkunci 36, Pengkalan Chepa,
16100 Kota Bharu, Kelantan, Malaysia
Email: salihin@umk.edu.my

Abstract: Information quality plays an important role in influencing technology use. To date there have been many studies determining the relationship between quality information and e-government use. However, very few studies have examined gender's role in simplifying the relationship between qualitative information and e-government acceptance. A total of 543 participants were involved in this study. This study determines that quality of information has a positive and significant relationship with quality of information, and the use of e-government, while explaining the variance of e-government adoption by 15%. The implications of the study have also been discussed.

Keywords: information quality; partial least square; PLS; SPSS; technology adoption; e-government.

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Biographical notes: Fahmi Zaidi Bin Abdul Razak is a Researcher in Research and Innovation Department, Sultan Ahmad Shah Pahang Islamic University College (KUIPSAS) Kuantan, Malaysia. His research interests include technology acceptance research, e-government adoption and business and management research. He has published several papers in international refereed journals such as *Asian Forum on Business Education*, *International Economics and Business Management Conference*, *Journal of Advanced Research in Business and Management Studies*, *International Journal of Technical Research and Applications*, *Middle-East Journal of Scientific Research*, *World Applied Sciences Journal* and *The Turkish Online Journal of Educational Technology*.

Azlina Abu Bakar is an Associate Professor/Researcher in the Faculty of Education and Human Development, University Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak Darul Ridzuan. Her research interests include psychology, educational psychology, structural equation modelling, well-being, quality of life and resilience. She has published several papers in international refereed journals such as *International Journal of Technical Research and Applications*, *Middle-East Journal of Scientific Research* and *World Applied Sciences Journal*.

Wan Salihin Wong Abdullah is a Professor/Researcher in the School of Social and Economic Development, University Malaysia Terengganu, Malaysia. His research interests include educational mathematics, measurement and evaluation and information system in social science. He has published several papers in both national and international refereed journals such as *Journal of Techno Social*, *International Journal of Technical Research and Applications*, *Middle-East Journal of Scientific Research* and *World Applied Sciences Journal*.

1 Introduction

Studies on the importance of quality in implementing e-government systems has been carried out by various researchers. The study conducted by Janita and Miranda (2018) determined that there are four key B2B service qualities, including reliability and privacy, utility of information, value-added services, and efficiency. Additionally, various definitions have been given by researchers to e-government. Verkijika and De Wet (2018) defined e-government as being the use of technology, and its application by government. Although e-government applications are gaining ground around the world, there are still a number of e-government applications that are not getting a place. As an example, in Malaysia the level of government utilisation is still low. The mean usage in the study was 2.745 for users aged 16–19 and 2.742 for users aged 60 and older (Sahari et al., 2012). The study employed a Likert scale of five points. This phenomenon indicates that the community has not yet fully utilised the government-provided application, rejecting its persistent use. The government will bear cost losses in building the government's initiative, which is quite expensive, according to the report. The cost to be spent by the government in developing the e-government system comes to about 80

million ringgit. In the event that the community does not fully utilise the applications that the government has prepared, wastage will subsequently occur. Previous research into the field of technology acceptance has used various theories, of which a number are well known, which can predict the factors that contribute to technology acceptance, such as technology acceptance model (TAM), unified theory of acceptance and use of technology (UTAUT) and others. In this study, the researcher have used variables from DeLone and Mclean's theory of information quality. The researcher only used information quality variables, as they indicate that information quality is an important variable when explaining government's acceptance among consumers in Malaysia. This study is expected to help authorities better manage and improve e-government applications. Therefore, this study is a very important for understanding the factors that encourage the community to continue using e-government applications.

2 Literature review

2.1 Malaysian e-government initiatives

As a thriving country, Malaysia needs to facilitate information movement between the government and the people, in an efficient and transparent way. Therefore, various initiatives have been put forward by Malaysia's government to help them streamline their work with the improved People's City, supported by the government initiative to improve relations between the government and the people. The implementation of the Super Corridor media plan is the beginning of the rapidly-expanding use of 'i City' in Malaysia, while indirectly some e-government applications have begun to be established. There are three main components in the government that business government and the community can use to understand the relationship between B2B, B2C and G2G components. There are several applications involved in government initiatives, among them being the generic office environment in the project monitoring system (PMS) (sistem pemantauan projek), e-sila¹, e-khidmat², e-filing e-perolehan³, Bursa Buruh Elektronik⁴, e-Syariah⁵ and PMS⁶.

2.2 Theories on technology acceptance

Various theories have been identified through the literature review of information technology receipts. Among the theories most commonly used are TAM, UTAUT, the DeLone and McLean success model. These theories play a role in describing user's acceptance of technology. Most of the variables of these theories are derived from the fields of sociology and psychology. The theoretical basis for TAM, for example, theory of reasoned action (TRA), or what is better known as the theory of justified action. This theory is the basis of many theories of information technology acceptance. The variables found in the TRA are similar to subjective attitudes and norms. This lies in accordance with Ajzen's attitude, which considers the psychological nature of a particular individual's likes or dislikes. TRA has been successfully used by many previous researchers in various fields of study, including in tourism, psychology, public health, information technology and others.

3 Hypothesis development

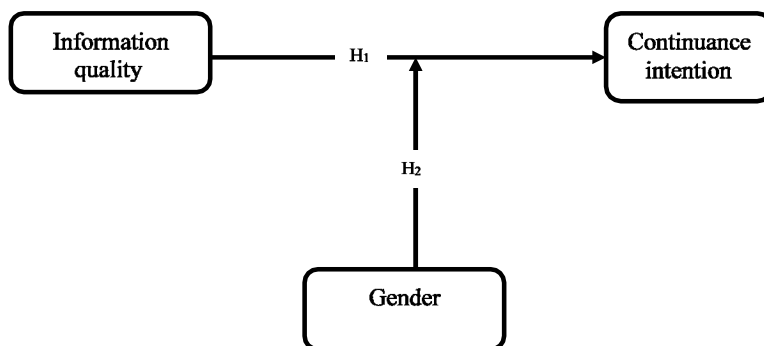
3.1 Dimension quality

The field of information technology acceptance study has various aspects, with one of the most important used by previous researchers being the quality dimension factor. There are three dimensions of quality commonly used by technology acceptance researchers. Factors such as service quality, content quality and system quality do not stand alone, but rather come in a theoretical form which is the DeLone and McLean success model. Wixom and Todd (2005) were among the early researchers who incorporated the literature of satisfaction and the literature of information technology acceptance into their works. Many scholars have argued that dimension quality plays a significant role in explaining user satisfaction and continuance intention/intention to use (e.g., Angelina et al., 2019; Iivari, 2005; Ramayah et al., 2010; Syahrizal et al., 2019; Tam et al., 2018; Tarhini et al., 2019).

3.2 Information quality

The relationship between information quality and consumer satisfaction has been studied by Wang and Liao (2008). Wu and Wang (2006) also examined the satisfaction of using knowledge management systems, applying an approach where the relationship between information quality and satisfaction was significant. The study by Chen et al. (2018) also examined the influence of doctors on the use of information technology in terms of mobile health application, finding the relationship to be significant. Additionally, Dağhan and Akkoyunlu (2016), who examined the relationship between information quality and satisfaction in an online learning environment, also found the relationship to be significant. The study conducted by Chen and Chang (2018) found that the relationship between information quality and satisfaction was positive and significant.

Figure 1 Conceptual framework



The study conducted by Chen and Chang (2018) focused on the acceptance of Airbnb applications. Meanwhile, a study by Zheng et al. (2013) also found that the relationship between information quality and satisfaction is positive and significant. In that study, Zheng et al. (2013) reviewed the acceptance of a virtual information-exchange application. The study by Vongsraluang and Bhatiasevi (2017) found that the relationship between information quality and use was significant and positive. In that study,

Vongsraluang and Bhatiasevi (2017) studied social commerce system success in Thailand, making use of the DeLone McLean success model. The recent study by Lwoga and Sife (2018) examined the impact of information, service and system quality on continuance intention, and found that the information quality aspect plays a significant role. Nugroho and Prasetyo (2018) have also used the DeLone and Mclean model in predicting the successful use of accounting software.

4 Research methodology

This study is a quantitative one, using cross-sectional data collection techniques. The research instruments have been built based on the work of previous researchers. A total of 579 usable questionnaires were returned by civil servant respondents-based around Pahang. After undergoing a data filtering process, there were only 549 lots of data considered to be meaningful for further analysis.

4.1 Data analysis

This study uses a second-generation technique, specifically the smartPLS software, to test the hypotheses. Additionally, the author will be use SPSS to obtain descriptive statistics. As a justification for using partial least square (PLS), the authors believe that this study is going to expand existing theories, whereas the earliest study will examine gender's influence in moderating the relationship between information quality, and the intention to use e-government tools. PLS has several advantages detailed by Hair et al. (2014), where PLS is suitable when data is not normally distributed. Besides this, there are other advantages behind the use of PLS, including the use of a formative item and complex model.

5 Results

5.1 Descriptive statistics

The first analysis used in this study was a descriptive analysis. As illustrated in the descriptive information, 78.6% of the participants were female and 21.4% were male. In terms of educational level, the results showed that SRP/PMR (Penilaian Menengah Rendah) accounted for 0.9% of the samples, SPM2 (Sijil Pelajaran Malaysia) accounted for 15.7% of the samples, STPM3 (Sijil Tinggi Pelajaran Malaysia)/Diploma accounted for 18.4% of the samples, Bachelor degrees accounted for 50.3%, Masters degrees accounted for 13.3%, and PhDs accounted for 1.5%. Most of the respondents were aged between 26 and 35 years of age (41.8%), while 36.5% were aged between 36 and 45, 16.9% were aged between 46 and 55, and 1.7% were aged between 56 and 65. In terms of ethnicity, 79.2% of respondents were Malay, followed by 20.1% who were Chinese, and 0.7% who were Indian. As for internet experience, 41.8% of the respondents had at least 1 to 3 years of experience with the internet, while 36.5% had 4 to 7 years of experience, 16.9% had 8 to 11 years of experience, and 3.1% had less than one year of experience. Furthermore the majority (47.7%) of the respondents were e-filing users, with ekhidmat accounting for 21%, e-sila accounting for 11%, electronic labour exchange accounting

for 10.7%, e-perolehan accounting for 7.9%, e-Syariah accounting for 1.5%, and PMS accounting for 11%.

Table 1 Descriptive information

	<i>Characteristics</i>	<i>Frequency</i>	<i>Percentage</i>
Ethnicity	Malay	430	79.2
	Chinese	109	20.1
	Indian	4	.7
	15–25	17	3.1
	26–35	227	41.8
Gender	Male	116	21.4
	Female	427	78.6
Age	36–45	198	36.5
	46–55	92	16.9
	56–65	9	1.7
Experience	Less than 1 year	3	.6
	1–3 year	70	12.9
	4–7 year	194	35.7
	8–11 year	96	17.7
	12 year and above	180	33.1
Education	SRP/PMR	5	.9
	SPM	85	15.7
	STPM/DIPLOMA	100	18.4
	Bachelor	273	50.3
	Master	72	13.3
	Doctorate	8	1.5
	Type of e-government tool	e-perolehan	43
	e-Syariah	8	1.5
	e-filing	259	47.7
	e-khidmat	114	21.0
	e-sila	60	11.0
	Bursa buruh elektronik	58	10.7
	Sistem pemantauan projek	1	.2

5.2 Goodness of measure

5.2.1 Multivariate assumption

Multivariate assumption is a procedure used for identifying issues in research data. Among the procedures performed are outlier, normality, homoscedasticity, and linearity tests. The findings show that there are some outliers in the study data. Outliers involved in the case numbered 185, 282, 327, 425, 426, 429 and 432, all of which were excluded from the analysis. Consequently, the author found that variance explained dropped from

0.198 to 0.180. The next round of testing revealed other outliers, which were 321, 337, 343, 344 and 376, which were then excluded in a yielding variance which explained a constant at 0.180. At this point in time, a new single outlier emerged, being 412, which was excluded in the following analysis in which the explained variance was raised to 0.184. This tells us that all outliers have not offered any significant impacts regarding results stability. However, there is a significant difference between before and after removing the outliers, in terms of normality. The skewness and kurtosis statistics have improved to a much greater degree, with the exclusion of outlier cases. Accordingly, the authors have retained all 536 samples (see Table 3). As for normality, the skewness and kurtosis results have shown that all data lies within an acceptable range of ± 1 (Hair et al., 2014).

Table 2 Before removing outliers

	<i>N</i>	<i>Std. deviation</i>	<i>Skewness</i>		<i>Kurtosis</i>	
	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Std. error</i>	<i>Statistic</i>	<i>Std. error</i>
Cont1	549	.815	-1.107	.104	2.278	.208
Cont2	549	.768	-.977	.104	1.911	.208
Cont3	549	.788	-1.010	.104	1.898	.208
Iq1	549	.782	-.443	.104	.304	.208
Iq2	549	.803	-.454	.104	.102	.208
Iq3	549	.836	-.438	.104	.207	.208

Table 3 After removing outliers

	<i>N</i>	<i>Std. deviation</i>	<i>Skewness</i>		<i>Kurtosis</i>	
	<i>Statistic</i>	<i>Statistic</i>	<i>Statistic</i>	<i>Std. error</i>	<i>Statistic</i>	<i>Std. error</i>
Cont1	536	.698	-.492	.106	.421	.211
Cont2	536	.684	-.535	.106	.539	.211
Cont3	536	.698	-.598	.106	.793	.211
Iq1	536	.782	-.472	.106	.355	.211
Iq2	536	.794	-.460	.106	.099	.211
Iq3	536	.829	-.438	.106	.217	.211

5.2.2 Validity and reliability

There are several measurements which are used to determine goodness of measure. Construct validity refers to the extent to which a scale of measures accurately represents the concept of interest, which can be assessed via convergent and discriminant validity as detailed by Hair et al. (2010). According to Hair et al. (2014), convergent validity can be achieved if the loading is above the common threshold of 0.70, and if the AVE value exceeds 0.5. Therefore this study possesses very good convergent validity (see Table 4). As suggested by the cross-loading table, all of the item loadings are greater than their own constructs, as compared to the loading from other constructs. As such, this study demonstrates good discriminant validity. In addition, Fornell and Larcker (1981) have used an approach which gives a consistent result, demonstrating an excellent discriminant validity when all square roots of an AVE are larger than the inter-construct correlation

(see Table 6) As for internal consistency, this study has utilised both Cronbach alpha and composite reliability. Cronbach alpha is a conservative measure of internal consistency, which suffers from the number of items in the scale, and has a tendency to underestimate reliability, as outlined by Hair et al (2014). Meanwhile, composite reliability is more relevant within the PLS analysis context. The results show that both constructs demonstrate excellent reliability, with all items exceeding the threshold value of 0.7.

Table 4 Convergent validity and reliability

<i>Construct</i>	<i>Item</i>	<i>Factor loading</i>	<i>Cronbach alpha</i>	<i>Composite reliability</i>	<i>AVE</i>
Information quality	IQ1	0.93	0.92	0.95	0.86
	IQ2	0.95			
	IQ3	0.91			
Continuance intention	CONT1	0.94	0.93	0.95	0.88
	CONT2	0.94			
	CONT3	0.93			

Table 5 Discriminant validity (cross-loading)

	<i>Continuance</i>	<i>Info</i>
Cont1	0.94	0.43
Cont2	0.94	0.41
Cont3	0.94	0.42
Iq1	0.41	0.93
Iq2	0.45	0.95
Iq3	0.39	0.91

Table 6 Discriminant validity

	<i>Continuance</i>	<i>Info</i>
Continuance	0.94	
Info	0.45	0.93

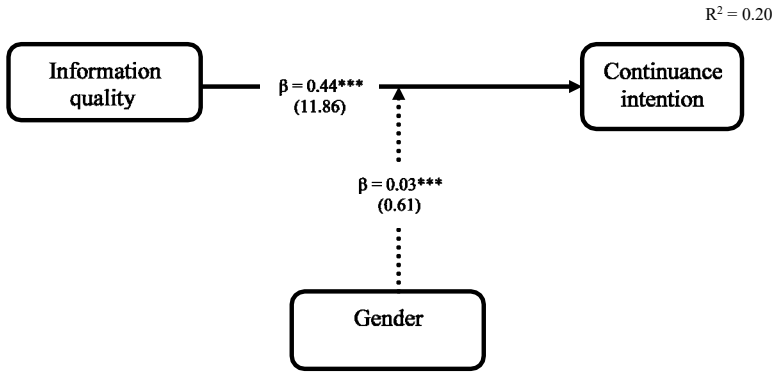
Note: The square root of AVE lies at the diagonal line of the correlation matrix.

Source: Fornell and Larcker (1981)

5.3 Hypothesis testing

<i>Hypothesis</i>	β	<i>T-value</i>	<i>P-value</i>	<i>Conclusion</i>	<i>R²</i>
H1 Information quality has a positive effect on the continued intention to use e-government tools	0.44	11.86***	0.00	Supported	0.2
H2 Gender positively moderates the relationship between information quality and continuance intention to use e-government, such that the effect is stronger for men	0.03	0.61	0.27	Not supported	

Figure 2 Results for the structural model



6 Discussion, conclusions and limitations

The use of consistent information technology will help ensure its successful implementation. People who use technology consistently are those who really understand its usefulness. As explained in the literature review section, the uses of e-government applications is very important, as it is the use of this government variable in Malaysian politics which has been found to have a significant relationship. The intent is to continue the use of ICT in this government relationship, while proving the validity of the previous studies undertaken by researchers, who have tested the relationship between the quality of information. With the intention of continuing the use of e-learning, this study's edited findings will help the government improve existing e-government applications to greater levels. A good application of e-government is an application which has the characteristics of the quality of this information, proving that if the people find that the quality of information is at a good level, then they will continue to use e-government applications. From a theoretical point of view this study is one of the earliest studies that examine the role of gender as a facilitator in the relationship between the quality of information. This next study should test the DeLone and McLean models in full, by incorporating gender roles as well as other demographic variables as the moderator relationship between quality dimensions. With the intention of continuing the use of e-government tools among Malaysians, researchers have recommended that more useful information should be placed on web-connected websites. If the information is provided perfectly and is beneficial to users, then e-government tools will continue to be used by the people. Important information should be included in the government's website, which is related to latest developments and perhaps the latest initiatives from the government. If the information is fully shared with the people, citizens will appreciate it and people will find that this e-government application is very beneficial to their daily lives. Consequently, they will tend to leverage on the government continuously. This study has some disadvantages, using only cross-sectional data collection methods which the researchers understand have some shortcomings. The major deficiency here is that the research findings cannot be generalised to the entire population. Only two variables have been involved in the study, meaning that the quality of information and also the gender indirectly explanatory power is lacking. In future investigations, it might be possible to

use a longitudinal data collection method in order to overcome the shortage of cross-sectional data collection methods. In conclusion, this study has confirmed the findings of the previous studies relating to the relationship between information quality and continuance intention, being that the two are positively related. However, the study's data has shown that gender does not play a role in simplifying the relationship between information quality and continuance intention, in terms of the use of e-government in the Malaysian context.

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Notes

- 1 E-sila refers to a portal under the Malaysian Public Service Department for the development of human capital.
- 2 E-khidmat refers to Malaysia's e-government initiative, which allows citizens to pay tax assessments and etc.
- 3 E-perolehan refers to e-government initiative in Malaysia which is equivalent to e-procurement.
- 4 Bursa Buruh Elektronik refers to Malaysia's e-government initiative which allows citizens to seek a job.
- 5 E-Syariah is Malaysian e-government initiative which focusing on Syariah courts management.
- 6 PMS is one of the e-government projects providing a framework for tracking the execution of projects through various government agencies.