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Examining the Factors Influencing Rural Citizens Adoption Towards Electronic Government Applications: A Descriptive Analysis

Rizuwan Abu Karim, Wan Aisyah Amni Wan Mohamad Saferdin, Ahmad Fadhly Arham, Nur Liyana Idris, Noor Hafiza Kamarudin

Faculty of Business and Management, Universiti Teknologi MARA, KM 26 Jalan Lendu, 78000 Alor Gajah, Melaka, Malaysia

Corresponding Authors Email: aisyah606@uitm.edu.my

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Abstract

This study is a descriptive study to examine factors influencing rural citizens adoption towards electronic government (E-government) applications. With the objective of E-government services is to provide convenience for their consumers, still consumers preferred to choose the counter instead of the E-government applications. With this scenario occurring at the moment, this study exploring the Diffusion of Innovation (DOI) as a factor that influencing rural citizens adoption towards E-government applications. Adopting survey research, the questionnaires for this study was adapted from several previous studies. Applying a descriptive analysis, respondents for this study were selected conveniently among E-government rural citizens users. Based on the 202 respondents was participated in this study, the findings indicated that complexity, compatibility, relative advantage and image were found to be the factors influencing rural citizens adoption towards electronic government applications. Since respondents located in the rural area, perhaps they noticed that E-government application can improve image within their community or within their organization.

Keywords: Electronic Government (E-government) applications, Diffusion of Innovation (DOI), Rural Citizens

Introduction

Electronic government (E-government) is growing rapidly in Malaysia since it was introduced in 2004 and now it focuses on the breadth and depth of Web 2.0 and mobile technologies. E-government has been under one of the seven flagship of Multimedia Super Corridor (MSC) that have been launched in 1997 which are consists Generic Office Environment (GOE), Project Monitoring System (PMS), Electronic Procurement (EP), Human Resource Management

Information System (HRMIS), E-Syariah (from Syariah Judiciary Department), Electronic Labor Exchange (ELX) and Electronic Services Delivery (EServices) (Siddique, 2008).

Development of E-government in Malaysia to enhance accessibility, convenience, and deliver information in order to increase speed and quality of policy development, enforcement and coordination (Kamaruddin and Nor, 2017). Malaysia aims to achieve Vision 2020 by transforming service delivery and administrative process by using E-government services also includes all government agencies, civil servants, business community and citizens (Shuib et al., 2019).

The global trends showed development of E-government with the global average E-government Development Index (EGDI) value increasing from 0.55 in 2018 to 0.60 in 2020 (United Nations, 2020). The best achievers in development of E- government with the highest rating class of the EGDI which are Estonia, Finland, Australia, Republic of Korea, Denmark, Singapore, Iceland, Norway, Japan, America, New Zealand, Sweden, the United Kingdom of Great Britain, the Netherlands and Northern Ireland (United Nations, 2020). In Asia, use of the E-government services with highest among Internet consumers, Singapore (75%), followed by Australia and New Zealand (70%) (Ross et al., 2004).

However, the level of adoption among Malaysian towards E-government applications is still low as compared to the other Asian countries and lagged far behind developed countries such as Singapore and South Korea (Ramli, 2017; Shuib et al., 2019). Furthermore, Malaysian citizens who are using the E-government applications are still less than 50 percent (Chandra, 2015). Moreover, the United Nations E-government Survey Report 2018 specifies Malaysia is ranked the 48th out of 193 in the E- government Development Index and the 32nd in the E-Participation Index (UNEGS, 2018). In addition, the level of adoption among rural citizen towards E-government applications is still rather low (Shuib et al., 2019). Thus, this study will examine factors influencing rural citizens adoption towards E-government applications.

Literature Review

Diffusion of Innovation (DOI)

According to Rogers (2003), the DOI defined as an innovation is an idea of practice, or object that is considered new by an individual or another unit of acceptance. Another definition by Rogers (1995), DOI is one of the popular models to interpret adoption of new technologies in information systems by consumers. Implementation of DOI theory, elderly are willing to learn and use new technologies with changes in the structure of the society because the adoption technology can build up social status of consumers (Chatzoglou et al., 2015). It was observed from the review of previous study pertaining DOI and E-government adoption has indicated compatibility, relative advantage, image and complexity can influence Electronic government (E-government) adoption (Karavasilis et al., 2010; Lean et al., 2009; Schaupp & Carter, 2005; Carter & Belanger, 2005)

Compatibility

Compatibility is defined as the degree to which a technological innovation is seen to be compatible with values, experiences, beliefs and need to adopters (Rogers, 1995). The high level of compatibility will positively influence the adoption of E- government services (Schaupp & Carter, 2005). Consumers are more interested by using E-government services which are

more compatible with the method itself. Consumers who perceive E-government services match with their current skills and need influence positively toward adoption of E-government services (Hung et al., 2006; Shuib et al., 2019). Consumers that have adopted the Internet can be expected to view E- government services that are compatible with their lifestyle (Carter & Belanger, 2005).

The positive effect of compatibility on adoption E-government services shows that consumers are more interested in using E-government services which are more compatible with the way they like to interact with (Carter & Belanger, 2005). Consumers are more likely to use E-government services if that online platform makes themselves easier to access it.
Compatibility will have a significant positive impact on adopting E- government services (Suki & Ramayah, 2010). This is also supported by Carter and Belangel (2005), mentioning compatibility has a significant determinant in user‟s adoption of E-government services. This is also supported by past research Zafiropoulos et al (2012), high level of compatibility influenced adoption of E-government services, teachers using this provided services regarding their career. Other than that, this is one of the cultural themes of governments that plays an active role by investing in campaigning internet technologies at all stages of daily life and to emphasize workstyle compatibility.

According to Shuib et al (2019), prior to low adoption of E-government services, the government should improve compatibility of E-government services with the newest technology and style of consumer to adopt in society and daily life. Consumers do not adopt E-government services regarding complicated functionalities and wrong design features of portals or websites. This has shown compatibility of E-government as an important factor influencing consumer adoption.

Relative Advantage

Relative advantages defined as the degree to which a technological innovation is seen as being superior to its predecessor (Rogers, 1995). The level of E-government services is perceived by consumers as being more beneficial in comparison to traditional services (Shuib et al., 2019). Previous study by Alomari et al (2012), relative advantage defines the level to which consumers perceive interaction with E- government services through websites act as a superior to traditional methods of interaction. Relative advantage is one of the DOI theories that was used in this research study.

According to Rokhman (2011) relative advantage as an indicator in adoption of E-government services. Findings in this study claimed that using E- government services can enhance their efficiency in gathering information from government agencies, easier to interact with government agencies and enhance user efficiency in interacting with government agencies. Adoption of E-government in Jordan of previous study used relative advantage for the same purpose to measure adoption among consumer (Alomari et al., 2012). Previous research by Rokhman (2011), E-government adoption of Indonesia, consumers are willing to adopt due to the success of E- government implementation.

Relative advantage is among the best indicators that can be used to predict internet consumers' probability to adopt E-government services. These results show a positive relationship with adoption E-government services (Mensah, 2019). These results can help service providers to improvise and enhance E-government service for consumers to enjoy the quality hence will recommend the use of E- government services to others.

According to Shuib et al (2019), the results shown as a significant result of relative advantage on adoption of E-government services due to the fact consumers may gather useful and reliable information from E- government services without wasting time travelling to the organization. In the context of E-government services, consumers collected data that interacted with government websites in order to gather information and complete transactions (Alomari et al., 2012).

Image

Image refers to one's perceptions of technological innovation as a status symbol (Moore & Benbasat, 1991). Based on previous research have broadly incorporated the construct of imagein E-government adoption studies Schaupp and Carter (2005). Image influences direct adoption and consumer perception to E-government services. Besides that, instead of coming over to the counter, consumers will be directly interacting through E-government services by reflecting superior status (Kumar et al., 2018).

Image brings one of the best indicators of DOI to ensure E-government serviceleads to be more efficient, transparent and reliable. Previous research in India supportsfactors influencing citizens to adopt E-government service when the electronic medium facilitates efficiency, speed and transparency towards public and other agencies and can perform government admin activities that publish for others (Gupta et al., 2016).

According to Lean et. al (2009), consumers who care more about their personal image show significantly higher adoption E-government services. This is also supported by Shuib et al (2019), the Malaysian respondents that are using E-government services may improve their social status and image.

Previous studies have proven the image of E-government services in Jordan already popular because their consumers use the internet and technology in their daily activities that are involved in education, purchasing and health (Alomari et al., 2012). The higher level of image enhances the value of E-government to increase adoption among consumers. Other than that, consumers that are using E-government services as prestigious will adopt E- government services compared to consumers who do not use online platforms. For instance, consumers who already adopt E-government as technically savvy will demonstrate higher adoption toward E-government services (Carter & Belanger, 2005).

According to Lean et. al., (2009), consumers believe E-government services are very useful and also enhance a positive image within a social group of society. Consumers who are frequently using E-government services will respond as to be Internet savvy (Gupta et al., 2016).

Complexity

The definition of complexity is an innovation perceived as difficult to understand and use (Rogers, 1995). The government takes initiatives free of any technical problems by ensuring usefulness of E-government services with the speed up processing procedures (Alomari, et al., 2012). This is one of the efforts the government should consider in terms of complexity to ensure the flow of process in doing E-government services will be beneficial to both parties including consumers and governments.

Previous studies have been mentioned complexity having significant relationship toward online services. According to Alomari et al (2012), complexity is substantial due to survey Jordanian citizens influence adoption of E-government services. Besides that, the government has to improve by providing clear direction and steps in conducting a particular transaction Alomari et al (2012) as well as (Liang and Lu, 2013).

Methodology

Descriptive research methodology was employed to achieved the objective of this study. The study used convenience sampling focusing on the respondents who are already using the Electronic government (E-government) applications. A questionnaire was used to collect data for this study. All the items in the questionnaire were gathered from the related literature and were revised to fit the purpose of this study. Five-point Likert scale ranging from strongly disagree (1) to strongly agree (5) were used to measure the items. Target respondents in this study was targeted among Malaysians citizens living within the Jasin, Melaka area. The questionnaires were distributed to household living in the rural areas in Jasin, Melaka, thus ensuring that only targeted samples will be included in this study. Only 202 completed questionnaires were returned. In terms of data analysis, SPSS was employed to describe factors influencing rural citizens adoption towards E-government applications.

Reliability of the Instruments

Reliability test was utilized to measure the dependability of a questionnaire and was tested using the Cronbach Alpha method. From the 202 sample of questionnaires returned, results indicated that complexity, image, compatibility, E-government adoption and relative advantage shows high consistency. Sekaran (2016) stated that the minimum level to accept reliability of instruments is 0.60. If the Cronbach's alpha value below than 0.60, the instruments is considered poor. Thus, based on the detailed of Cronbach alpha results presented in the Table 1, it shows that the items used to measure the variable are consistent and reliable and therefore goodness of measure was demonstrated.

Table 1
Reliability of the Instruments

Measures	No. Of Items	Cronbah's Alpha
E-government Adoption	5	0.851
Compatibility	5	0.852
Relative Advantage	5	0.844
Image	5	0.903
Complexity	5	0.908

Findings

Respondents Demographic Profiles

Table 2 presents the frequency of demographic data of the respondents. In terms of gender, out of the 202 respondents, 35.6% of the respondents were male, and the remaining 64.4% were female. With reference to the age of respondents, majority of the respondents indicated they were between the ages of 26 to 35 years old (57.9%). Followed by 20.3% of them reported ages between 18 to 25 years old. Meanwhile 10.9% reported their ages between 36 to 45 years old. Furthermore, 9.4% of respondents and 1.5% of respondents respectively were reported being between the ages between 46 to 55 years old and were over 56 years old. In terms of education level, 37.6% of the respondents were diploma holders and degree holders respectively, 17.8% of respondents were secondary school leavers, 12% of respondents were master holders and the remaining 2% of respondents were PhD holders. In terms of time of using computer per week, majority of respondents (53.0%) reported they were spent less than 12 hour per week to used computer. Meanwhile, 23.8% of respondents respectively were spent between 12 to 24 hours per week and more than 24 hours per week to used computer. With reference to the occupation of respondents, about 25.2% of respondents were working in finance and insurance sector, while 4% of respondents respectively were working in the legislation and education sector, 11.9% of respondents were running their own business and 10.9% respondents were working in medical sectors. Meanwhile, 6.4% of respondents were full time housewives or homemakers and 37.6% of respondents were retirees. With regard to the monthly income of the respondents, majority of the respondents (n=70, 34.7%) reported their monthly income were between RM1201 to RM3000. Followed by 54% of respondents reported their monthly income were between RM1200 and below. Moreover, 44% of respondents stated their monthly income were between RM3001 to RM5000 and 34% of respondents mentioned their monthly income were RM5001 and above.

Table 2
Demographic Profile

Demographic	Frequency	Percent (%)
Gender		
Male	72	35.6
Female	130	64.4
Age		
18 - 25	41	20.3
26 - 35	117	57.9
36 - 45	22	10.9
46 - 55	19	9.4
56<	3	1.5
Education level		
High School	36	17.8
Diploma	76	37.6
Degree	76	37.6
Master	12	5.9
PhD	2	1.0
Time of Using Computer Per Week		
Less than 12 hours	107	53.0
12 - 24 hours	47	23.3
More than 12 hours	48	23.8
Occupation		
Legislation	8	4.0
Finance and insurance	51	25.2
Education services	8	4.0
Businessman	24	11.9
Medical sectors	22	10.9
Housewife / Homemaker	13	6.4
Retirees	76	37.6
Monthly Income		
RM1200 and below	54	26.7
RM1201 to RM3000	70	34.7
RM3001 to RM5000	44	21.8
RM5001 to above	34	16.8

Descriptive Analysis for Electronic Government (E-government) Adoption

Table 3 displays the descriptive analysis of Electronic government (E-government) adoption. E-government adoption denotes the user perception for the use of existing technology and will definitely encourage its usage (Mensah, 2019). There are five items measuring the E-government adoption such as “I would use state government services provided over the E-government applications”, “I would use the E-government applications for gathering state government information”, “I intend to use the E-government applications system on a regular basis in the future”, “Interacting with the state govt. over the E-govt. applications is something

that I would do" and "I will strongly recommend others to use E-government applications and information technology services" . Based on the Table 3, all items recorded a mean value greater than 3.5 and the overall mean score stood at 3.98. Hence, it can be concluded that rural citizen agreed to adopt towards E-government applications. Furthermore, the highest mean for E-government adoption item stood at a mean value at 4.21 and it is highly possible that rural citizens will strongly recommend others to use E-government applications and information technology services. In line with this, it shows that rural citizens acknowledge E-government applications is meaningful to share. Furthermore, the second highest mean for E-government adoption item stood at mean value at 4.03. The results of the analysis has shown that rural citizens has an intention to use E-government applications on a regular basis in the future. Meanwhile, the lowest mean value has found stood at 3.85. Based on these results, it is explicitly shows that rural citizens would use E-government applications as a medium to get any information related services provided by the government.

Table 3
Descriptive Analysis for E-government adoption

Items for E-Govt. Adoption	Mean	Standard Deviation	Rank (Based on mean)
I would use state government services provided over the E-government applications	3.95	0.91	3
I would use the E-government applications for gathering state government information	3.87	0.96	4
I intend to use the E-government applications system on a regular basis in the future	4.03	0.83	2
Interacting with the state govt. over the E-govt. Applications is something that I would do	3.85	0.95	5
I will strongly recommend others to use E-government applications and information technology services	4.21	0.78	1
Overall mean for E-govt adoption	3.98	0.88	

1=Strongly Disagree; 2= Disagree; 3= Not Sure; 4= Agree; 5= Strongly Agree

Descriptive Analysis for Factors Influencing rural Citizens Adoption Towards Electronic Government (E-government) Applications

Table 4 displays the descriptive analysis for factors influencing rural citizens adoption towards Electronic government (E-government) applications. Compatibility, relative advantage, image and complexity refers to the factors. All items recorded a mean value greater than 3.62 and the overall mean score stood at 3.95. Highest mean score for factors influencing rural citizens adoption towards E-government applications was seen on complexity with a score of 4.12 and standard deviation of 0.754. It was followed by the second highest score, which is compatibility with a score 3.988 and a standard deviation of 0.832. Followed by relative advantage with mean score 3.948 with standard deviation 0.846. For the lowest factor, image was recorded with the mean score of 3.744 and standard deviation 0.942.

Complexity to some extent has to do with consumers willing to use E- government services which are not too complicated to access, easy to understand and at the same time saving time for consumers (Lean et. al., 2009). In the aspect of the compatibility and rural citizen adoption towards E-government adoption, the highest score for the mean item stood at 4.20, and the standard deviation is 0.71. This reflects that rural citizens agreed that they can get the latest information from E-government applications. The second highest mean for compatibility is 4.16, and the standard deviation is 0.74. This finding means that rural citizens can easily access E-government applications at any time by using any device such as computer, hand phone and tablet. Furthermore, the lowest mean under compatibility variable stood at 4.04, and the standard deviation is 0.80. It figures shows that rural citizen can be easily become skillful by using E-government applications.

Compatibility is defined as the degree to which a technological innovation is seen to be compatible with values, experiences, beliefs and need to adopters (Rogers, 1995). The highest score for the mean is 4.09, and the standard deviation is 0.75 found in the question "I think using the web would fit well with the way that I like to gather information from E-government applications". The second highest mean for compatibility is 4.05, and the standard deviation is 0.82 found in question "Using E-government applications will fit into my work style". Meanwhile the lowest mean under compatibility variable stood at the value 3.81, and the standard deviation is 0.95. This value was found for question "Using the E-government applications to interact with the government would incompatible with how I like to do thing".

Relative advantages defined as the degree to which a technological innovation is seen as being superior to its predecessor (Rogers, 1995). Table 4 represents the mean and standard deviation for relative advantage. The highest score for the mean stood at the value of 4.12, and the standard deviation is 0.73. This finding indicated that by using the web, it would enhance rural citizens efficiency in interacting with the E-government applications. For question "Using the web would not make it easier to explore and gather information from E-government applications" shows the lowest mean score. The means score stood at the value of 3.62, and the standard deviation is 1.12.

The lowest factors influencing rural citizens adoption towards E-government applications is image which recorded a mean of 3.744. Image refers to one's perceptions of technological innovation as a status symbol (Moore & Benbasat, 1991). Based on the results, rural citizens perhaps can recognize the importance of E-government applications in their daily life. Since respondents located in the rural area, perhaps they noticed that E-government application can improves image within their community or within their organization.

Table 4
Descriptive Analysis for Factors Influencing Rural Citizens Adoption Towards Electronic Government (E-government) Applications

Items for Compatibility	**Mean**	**Standard Deviation**	**Rank (Based on mean)**
I think using the web would fit well with the way that I like to gather information from E-government applications	4.09	0.75	1
Using E-government applications will fit into my workstyle	4.05	0.82	2
I think using the E-government applications would fit well with the way that I like to interact with the government	4.01	0.82	3
Using the E-government applications to interact with government would fit into my lifestyle	3.98	0.82	4
Using the E-government applications to interact with the government would incompatible with how I like to do things	3.81	0.95	5
Average for Compatibility	3.988	0.832	
Items for Relative Advantage	**Mean**	**Standard Deviation**	**Rank (Based on mean)**
Using the website would enhance my efficiency in gathering information from the E-government applications	4.12	0.73	1
Using the web would enhance my efficiency in interacting with the E-government applications	4.12	0.75	2
Using the E-government applications would make it easier to interact with government	3.95	0.81	3
Using the E-government applications would give me greater control over my interaction with government	3.93	0.82	4
Using the web would not make it easier to explore and gather information from E-government applications	3.62	1.12	5
Average for Relative Advantage	3.948	0.846	
Items for Image	**Mean**	**Standard Deviation**	**Rank (Based on mean)**
People who use state the E-government applications on the Web have a high profile	3.69	0.97	4

People who are important to me think that I should use the E-government applications	3.80	0.88	1
Interacting with state government agencies over the E-government applications enhances a personal's social status	3.66	0.95	5
People who are influence me think that I should use the E-government applications	3.77	0.96	3
People who are using E-government applications improves image within community or organization	3.80	0.95	2
Average for Image	3.744	0.942	
Items for Complexity	**Mean**	**Standard Deviation**	**Rank (Based on mean)**
It is easy for me to navigate within E-government applications.	4.16	0.74	2
Learning to interact with E-government applications would be easy for me.	4.11	0.75	3
It would be easy for me to become skillful at using a E-government applications	4.04	0.80	5
I believe interacting with the E-government applications would be a clear and understandable process.	4.09	0.77	4
Overall, I believe that using the E-government application to explore information or do different transactions is easy	4.20	0.71	1
Average for Complexity	4.12	0.754	

1=Strongly Disagree; 2= Disagree; 3= Not Sure; 4= Agree; 5= Strongly Agree

Discussion and Conclusion

The statistics include mean and standard to identify factors influencing rural citizens adoption towards Electronic government (E-government) applications. The basic theoretical model used in this study was diffusion of innovation (DOI) theory. Based on the Table 4.3 analysis of mean and standard deviation, it is clearly shows that complexity, compatibility, relative advantage and image are the factors that will influence rural citizen adoption towards E-government applications. This finding is consistent with the findings of Shuib et al (2019); Karavasilis et al (2010); Lean et al (2009); Schaupp and Carter (2005); Carter and Belanger (2005) where these researchers reported complexity, compatibility, relative advantage and image were among factors that will influence Malaysian citizen to use E-government application.

This research fills the gap in the research on factors influencing urban consumers adoption towards E-government applications. The research results show that all factors of DOI theory can influence urban citizens adoption towards E-government appliances. For future research, it is recommended that to incorporate the other theory such as theory acceptance model (TAM) to explore further about factors that will influence rural citizens adoption towards E-government applications.

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