User Based Design Model to Enhance Satisfaction by Using Government Online Information

Massila. Kamalrudin, Hamdan Hmoud Sroukh Alderei, Safiah Sidek, Halimaton Hakimi

Abstract--- Government information online is a transformation of relations between the internal and external public sector, through ICT, to enhance government service delivery and participation in the citizenry. By using government information online, a lot of advantages can be obtained, and it is important for users from different generations to obtain positive benefits from them. As the world is quickly growing without boundaries, the Internet and the worldwide web have become a common means of providing government information and services to the public, the companies and other governmental organizations. This paper reports a review on the analysis of the usage patterns of government online information for different generation cohort and existing work related to satisfaction of online information. The analysis were based on two questions that address the usage patterns of government online information and existing works related to satisfaction. Based on seventy selected articles reviewed, it was found that we found that 'education purpose' is the most commonly investigated usage pattern and most of related works of satisfaction focusing in developing model and framework.

Keywords---User Based Design, Online information, Generation.

I. INTRODUCTION

Government online information is actually very important as it acts as important agent to delivering all the policies or any other crucial information from government to citizens. It is essential for country to implement government information online as it helps to smooth the state's administration system, especially in the developed country. That is why the low number of usage of government information online will become a liability to the country itself. However, considered the current era, known as the Information Age of the 21st century, which is characterized by the rapid shifts from the traditional industry to the industrial revolution, from the computer age, the digital age to the new media age (Matiyas, 2015), the most challenging tasks is to ensure the government information online is inclusive to the all generations, which can be identified into three categories, namely the digital natives, digital immigrant and digital immigrants.

For enhancing government information online, the usage pattern of the users from different generations need to be taken into consideration in order to synchronize it with the problem faced by the users. In this context, the enhancement of the user response actually depends on the problem facing and the usage pattern by the user which come from different generations. However, there have been very limited works to capture or analyze the usage pattern specific for each of the three generations. Most of the works tend to study on the enhancement of the users response generally (Ball et al., 2017), rather than the division of digital generation. In fact, in order to enhance the satisfaction of the user of government online information, it is essential to identify the usage pattern used by them and what types of problem faced by users. Therefore, enhancing the satisfaction and loyalty to the different users of government information online in one of the ways to create a better learning process for all the generation which will became a great prospect for their future.

Hence, this study presents a Systematic Literature Review (SLR) that reports two findings for user based design in using government online information. The first finding is to identify the usage pattern of government online information for different generations cohort, and second is to identify the existing works to enhance government online information. This paper is organized into four main sections. After the introduction, the second section presents the methodology of the review. The third presents the findings and discussion section. Finally, conclusion presented in the fourth section.

II. RESEARCH METHODOLOGY

We constructed a review protocol to search for the relevant studies based on Kitchenham [3] systematic review approach. As our research is more focuses on wider knowledge in readiness model and smart government. The basic phases of [3] are divided by three phases which are planning, conducting and reporting. In the planning phase, we designed research questions as in Table 1. These research questions are designed to address the organization issues as aforementioned.

Table 1: Research questions

RQ1	What are the usage patterns of government online information for three groups of digital generation?
RQ2	What are the existing works to enhance satisfaction and loyalty of using government information online?

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Activities of the review protocol are shown in Figure 1. The aim of the review protocol is to ensure the complete analysis is supported by all the appropriate research. ScienceDirect, IEEE Xplore, Springer, Scopus, Google Scholar and ACM Digital Library were the search engines for the empirical research. The search keywords were used to ensure that all related documents were included in various topics. (User Based Design OR User Centered Design Model) AND (Pattern OR Usage Pattern) AND (Online Information OR Information) AND (Approach OR Method OR Framework OR Model) AND (Government) to collect all the relevant papers.
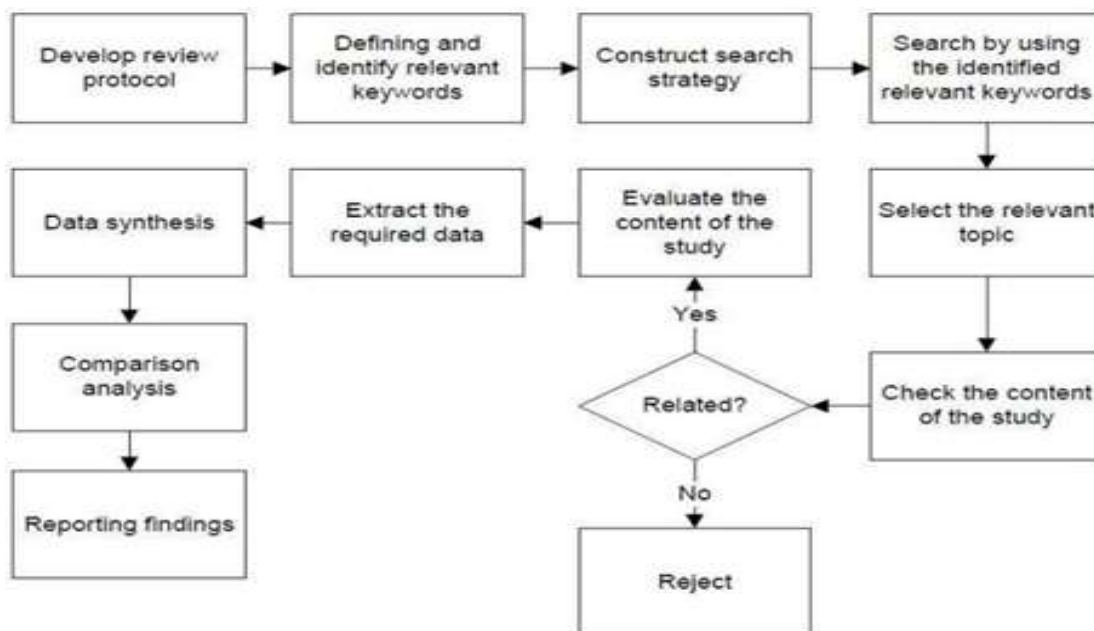

Figure 1: Review protocol process [3]

We applied inclusion and exclusion criteria as outlined in Table 2 to collect relevant studies. By analyzing the title, abstract, and conclusion of the primary identified studies, we eliminated any unrelated studies. After applying these steps, 89 studies were retained. Furthermore, we accessed and evaluated the articles by checking the content of the articles. Irrelevant studies were rejected at this stage and the relevant studies will be analyzed. Out of 89 articles, only 70 articles were considered for further review. The next phase was to conduct the comparison analysis and report the analysis of the related works.

Table 2: Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Papers focusing on user based design model in government online information	Studies not related to the research questions
	Studies unclear
Papers focusing on frameworks, models, methods and approach used in user based design in government online information	

III. FINDING AND DISCUSSION & RESULTS

We found 13 significance patterns of usage, identified from the 70 studies related to the government information online enhancements for the users. For the purpose of this review, we focus on the most top structured usage pattern of government information online for different generation. The results are presented in Table 3.

Table 3: Usage pattern of government online information for different generations

	Usage pattern of government online information	No of paper study	Type of generation cohort		
			Digital Natives	Digital Intermediates	Digital Immigrants
1	Public policy or issue	12	[1],	[2], [3], [4], [1], [5], [6], [7]	[8], [9],[10], [4], [1], [11], [12],[5], [6]
2	Government agency services	9	[13]	[9], [3], [10], [13], [11], [12], [5], [14]	[15], [14]
3	Religious info	7	[15]	[15], [3], [16], [11]	[15],[10],[12]
4	Official government documents or statistics	8	[17]	[2], [3],[10], [18], [17],[12], [14]	[10], [13],[17]
5	Recreational or tourist information from a government agency	11	[19],[20], [10], [4], [21],[12], [5], [22]	[19], [10], [11], [14]	[19], [7]
6	Advice on health or safety issue	16	[23],	[10], [24], [1], [13], [18], [25], [26], [11], [27]	[28], [15], [10], [24], [4], [1], [13], [18], [26], [27], [29], [5]
7	Applied for government benefits	8	[9], [17], [12], [5], [30]	[10],[17], [31], [30]	[10], [32], [33]
8	Info for a government job	11	[34], [35], [23], [36], [9], [10], [11], [12]	[23], [36], [10], [12], [37]	[36],
9	Entertainment	7	[10], [38], [10], [39], [12], [31], [37]	[37]	
10	Education	24	[40], [41], [35], [23], [42], [24], [43], [8],[9], [3], [20],[39], [4], [44], [45], [32], [46]	[24],[20], [39], [45], [47], [46], [41], [38], [15], [14]	[24], [39], [45], [46], [14], [6]
11	Family Institution	6	[40], [9], [39]	[9], [3], [39],[48], [12]	[3],
12	Personal Identification	4	[40],[39],	[20],[39], [48]	[20],[39], [48]
13	Business purpose	9	[49], [30], [10], [50], [12], [51], [52]	[49], [30],[10], [4], [53],[50], [51]	[30],[51]
14	Banking Purpose	7	[54], [3],[50], [55]	[54], [3], [9], [50], [55], [30]	[12], [55]
			66	80	49

Based on the list of the usage pattern of government online information for different generations in Table 3, we found that 'education purpose' is the most commonly investigated usage pattern, which accounts for 24 studies. This is followed by 'safety or healthy advice' and 'government public policy information' with 16 studies and 12 studies respectively. Both of 'tourism information' and 'government job vacancy' contribute to 11 studies for each. The others, namely the 'government agency services' and "business purpose" were found in nine studies, 'government benefits' and 'download government form' in eight studies, 'entertainment', 'banking purpose' and 'religious info' in seven studies, and 'family institutions registration' in six studies. Additionally, the 'personal identification' is the least studied which is found in four studies. Results of the review show that 'education purpose' is the most significance usage pattern for using government online information.

Next, we discussed the comparison of related works in satisfaction and loyalty enhancement for using government online information. For each of the paper, we identified the type of contribution, and detail information of their contribution. The results are presented in Table 4.

Table 4: Approaches, Tools, Method/Techniques and Framework of Satisfaction and Loyalty

Paper Id	Contribution			
	Approach / case study	Framework/ Model	Experiment / Literature study	Detail
[56]		/	/	Comprehensive theoretical model of social interaction and its antecedents that explain how digital natives develops trust and loyalty
[57]		/		Develop complexity of age-aware E-Government for instance, an age-aware Technology Acceptance Model for E-Government
[58]		/		E-learning system success model
[59]		/		A model of citizen loyalty with government online self-service delivery options.
[60]		/		Partial Least Squares Path Modelling (PLS- PM) technique
[61]	/			Design of adaptive interface for e-Gov services.
[62]	/	/		research was structured into three phases along the development model of the ISO 9241-210
[63]	/	/		Swedish Customer Satisfaction Barometer model (SCSB). A case study in Pakistan
[64]	/	/		Systematic literature review on loyalty towards e-government
[65]			/	Systematic literature review on loyalty towards e-government
[66]	/	/		Develop a recognized model based on ACSI for measuring the customer satisfaction index for the e-services in the Kingdom of Bahrain (BHCSI).
[68]	/	/		Technology Acceptance Model, Unified Theory of Acceptance,Case study in China
[69]			/	Challenges , Issues and Complexities
[70]	/			the main reason which inhibit readiness to use this e-government service in Poland
Total	7	10	3	

The list of related works in satisfaction and loyalty are presented in a table of comparison as shown in Table 4. Table 4 shows the comparison analysis of the approach, framework, model and method involved in using government online information. Referring to the contribution aspect in Table 4, most of the existing works focus on developing model, frameworks and approach, while limited works were involved in conducting experiment and literature study and none was reported on developing tools and approach. The finding indicates that there is no outstanding work of user based design model to enhance loyalty and satisfaction of using government online information.

IV. APPROACH/FRAMEWORK/MODEL IN ENHANCING LOYALTY AND SATISFACTION OF USING GOVERNMENT INFORMATION ONLINE.

Some work has been performed to analyze online government information improvement in its loyalty and satisfaction. For instance[6] evaluated the satisfaction and allegiance of government-related websites across e-government and e-business. The research gathered information from the American Customer Satisfaction Index (ACSI) and used structural equation modelling to compare the determinants and the results of satisfaction across these sectors. In this research a sample of survey responses were gathered from e-users and e-government websites. Model results demonstrate that while for e-business customers some similarities exist, satisfaction mainly depends on the website's personality, while satisfaction with e-government is determined more similarly by multiple predictors.

In an attempt to examine the loyalty and satisfaction of users towards government information online, [62] conducted a survey through a developed questionnaire distributed. Then, they analyzed the data by using appropriate statistical methods and tested the hypotheses of this study, involving loyalty and satisfaction of customers.

In the study context of integrated, interoperable transactional e-services, supplied by the Saudi Ministry of Higher Education (MOHE), the study also[66] created a conceptual framework that explains citizen allegiance to e-government self-service offering alternatives. The suggested model was empirically evaluated by the linear various regression assessment of 402 study responses from Saudi citizens / users of transactional e-services.

The research was performed to identify, after the e-government facilities supplied by the Pakistan Punjab Province e-government portal, the most important factor for the satisfaction of Pakistani people. However, the public loyalty was not investigated. Even if their study results are only limited to Pakistan, we believe the technique can be replicated to study factors of allegiance.

[1] emphasized on loyalty and satisfaction in using government information online. However, they only focused on senior citizen only. In this research, they conducted empirical research to examine the satisfaction of senior citizens with e-government portals. Thirdly, the study included the concept of social influence as the determinant of senior citizen satisfaction and loyalty with e-government portals. They also found supporting evidence for the argument.

In the last few years, researchers have witnessed the development model to enhance satisfaction and loyalty by using government information online. For example, [65] discussed satisfaction of the consumers. Their research aims to evaluate the achievement of e-government with the satisfaction of the citizen and to explore its relations with the performance of the e-government services. The researcher then performs a systematic study of the Swedish random citizen, which receives 425 valid replies. The most interesting thing is that they have explained in detail how to improve IT consumers ' satisfaction. Citizen satisfaction with e-government services is, in order to simplify the way in which they explain it, connected with citizens ' view of internet services (transaction), information security (transparency) and digital communication (interactivity) in terms of evaluating performance and service results.

V. CONCLUSION

An analysis of methods, approaches and model of satisfaction has been conducted. A list of existing works related to satisfaction has been presented in Table 4. Based on the analysis of existing works, work on user based design model to enhance user satisfaction using government online information is still non-existence. Moreover, most of the works in satisfaction focus on the services. Despite that, approach, framework, model and method involves various domains, which are e-government, education, and IT. Most of the existing works focus on developing model and frameworks and method while limited works were involved in developing tools and approach. The finding indicates that there is no outstanding work of satisfaction using online information in governments especially based on different generation. For future work, we plan to develop a user based design model to enhance user satisfaction using government online information as guideline and reference to the government in identifying the user satisfaction toward government online information.

VI. ACKNOWLEDGEMENT

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