Participation to Public e-Service Development: A Systematic Literature Review

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***Abstract*— Public e-service has mainly been advanced by government perspective in mind but less attention have been given to other participants' consideration including citizens' participation. Therefore, there is improved interest in how to integrate citizens' views on development process of public e-services. Citizens' participation believed to bring value to various system development projects. However, the existing research has shown that introducing user participation (in this case is citizen participation) to public e-service development can be challenging. The study literature review aims to investigate factors that influence citizens' willingness and ability to participate in public e-service development according to three user participation theories: User-centered Design, Participatory Design and User Innovation. The result will gives benefit to the government in understanding the factors that influence citizen participation and also they could build the more appropriate systems that fit into citizens' needs.**

***Index Terms*— User participation; Citizen; Public e-service; System development; Systematic literature review.**

I. INTRODUCTION

For decades, public participation has brought significant changes in various system development projects. Currently, there is expectation that the progress of public e-services will have great benefits so that public participation in the development of public e-services is very challenging to study. Moreover, public e-service starts to be widely used in government which many studies will be discussed in this paper.

Reference [24] states that e-government has three purposes: 1) to increase the opportunity of citizens to interact with government, 2) to improve the efficiency of government authorities in decreasing the amount of user manual, and 3) to increase democracy process through system transparency by the government.

Generally government authorities use IT to diminish costs and time in services to citizens and organizations [25]. As a result, e-participation was developed with the perspective of the government so that the consideration of stakeholder gets less attention.

What are the factors that influence public participation in public e-service development is the question of this research. This Systematic Literature Review aims to analyze the empirical findings in doing a particular emphasis on the factors that influence public participation in the system development. The purpose of this study are first is to review the article in understanding the research related to public e-services, particularly how to define the factors that influence the community to be involved in the development of the system. Moreover, the second purpose is to discuss the major issues that influence user's participation based on empirical findings.

II. BACKGROUND STUDY

A. Definition and Approaches for Public E-service

In some literature, user participation discussed to understand some aspects of public e- service systems. Those aspects including use, adoption, and development of public e-service systems. However, this study emphasizes on literature that support citizen participation in public e-service development.

User participation is recognized as an important topic in system development [4]. Moral reason, leveraging of power, improved satisfaction and solution are some different arguments for participation. In the discussion about public e-service, the citizen becomes a main user of the system. Reference [5] found that a citizen-oriented (hybrid) approach in e-government projects implementation provides an additional avenue through citizens who can learn about ICT and become familiar with new the technologies. The study also declared that e-government uses could be particularly promising because of their ability to allow citizens taping into civic resources to achieve technological experience and know how to use it.

Another study declared citizen participation as public participation. According to [7], since 1960s public participation has been the central instrument to democratize, legitimate, and enhance the policy making quality. And now the form of public participation changes into e-participation. Wimmer and Smith in [7] found that the main focus in public participation area is the concern over citizen and the way to motivate, engage, and keep them involved to accomplish a strong public participation in the decision-making processes, and to promote efficient society and government support.

Reference [6] classified three methods to understand public e-service participation among citizen which are a) Participatory Design, b) User- Centered Design, and c) User

Inovation.

B. Participatory Design (PD)

To ensure the compatibility between technology and the way people (want to) perform their work describe as PD's aim. System developers and users treats as equivalent partners in this approach. Therefore users should be able to influence that decision because they are affected by it. Moreover, system developers and users have a shared responsibility to cooperate in the development process through mutual dialogue as an equal partner [22].

C. User- Centered Design (UCD)

According to Karlsson et al (2012), the overall idea of UCD is the development system has a purpose to serve the user. Hence, the development process should be designed to take an 'individual user's capability into consideration and fully satisfy their need related to the system to be developed. Thus user's needs should dominate the interface design. The interface requirements are important aspects in determining the functionality and behavior of the system being developed.

D. User Innovation (UI)

Reference [6], described the general goal of UI is to deliver "innovative systems functionality", whereby the users themselves drive innovation. A central concept in UI is lead the users. Design process in UI describe as "an intertwined part of the user's daily work where products and services are planned and produced upon requirements that should be satisfied. Practically it means that the lead user responsible for recognizes the problem as good as designed the solutions [23]. It is significant that systems developers could analyze and evaluate "how lead user data apply to the more distinctive user because not entirely the lead user's solution meet the user needs in general. Therefore, the main task of systems developers' is to capture lead users' idea and design, and then transform it into complete solution in cooperation with lead users'. Consequently, the initial design by systems developers might differ in some aspects from the final solution in order to make it work for the general public.

III. Research Method

The Systematic Literature Review is selected as a method for identifying and reviewing how the community participation that has been studied before. A review was done in systematic and rigorous standards. The aim is not only to summarize the existing research but also to include the elements of analytic criticism. The study's result are being reviewed and analyzed as the data for literature review [26]. There are five online research databases chosen to search the article, which are ACM Digital Library, Springer Link, Science Direct, Emerald, and Google Scholar. ACM and Springer were selected because they have conference proceedings and journals on public participation, e-government, e-public service, and information systems.

Moreover, Springer Link and Emerald contain some significant journals from various scientific fields such as business, management, and psychology. In order to increase the reliability of results and ensure that this review included articles from various scientific fields, the search process was repeated using Google Scholar. Five new papers came as the results.

IV. Result

A. Study Found

The first searching was using keywords (e-government OR e-participation) AND (public e-service) and was obtained 112 paper. Then, the second searching was using keywords (OR e-government e-participation) AND (citizen participation) and was obtained 41 paper. The third searching was using keywords (e-government) AND (OR public citizen participation) and got 18 papers.

The total of the paper is one hundred and seventy-one. Then each paper was noted and manually examined to determine its relevance to the topic.

B. Candidate Studies

At this stage, 171 papers were chosen by adjusting the abstract with the research question. And the result is 49 papers selected.

C. Selected Studies

The selected articles or paper meet the following criteria:

- The research focuses on e-participation which affects the public e-services development
- The research discusses the activities of users in online communities in terms of participation.
- The article according to the research question.
- The article published between the years 2008-2015.
- The overall article is the latest research because research relating to public e-participation and e-service began around 2008.

The result is the 20 articles met the criteria for a review which can be seen in Figure 1. Then, the data extraction, which is the number of study from the selected paper, can be seen in Table 1.

Figure 1: Searching strategy for systematic literature review

Table 1
Number of Studies in Selected Sources

Source	Studies Found	Candidate Studies	Selected Studies
Science Direct	94	29	12
Springer	6	0	0
ACM	59	19	8
Emerald	7	1	0
Google Scholars	5	0	0
Total	171	49	20

D. Candidate Studies

From the 20 selected papers, there are 50 authors who participated, 34 institutions, and 18 universities. Each author only wrote one paper, and fortunately, each institution has also only one paper. The institution location is in Australia, China, France, Germany, Jordan, Lebanon, Malaysia, Mexico, Norway, Pakistan, Portugal, Spain, Sweden, Taiwan, Tajikistan, Turkey, United Kingdom, and USA.

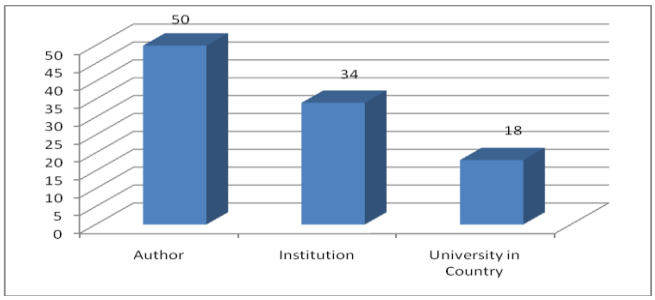

Figure 2: Author Demography

All the author worked in 16 departments which are Business, Business Management, Economics, Economics and Finance, Electronics and Telematics Engineering, Information, Information and Communication Technologies, Information Systems, Information Systems and Technology, Management, Management Information System, Public and Politics , Public Administration, Public Policy, and Technology and Society. Then, it all goes into 10 groups department, namely: Business and Management, Business and Technology, Engineering, Computer Science, Information and Communication Technologies, Economics and Finance, Information Systems, Society and Technology, Public, Politics and Management.

Author's' academic background can be seen in Figure 3, while the University in the country can be seen in Figure 4. Paper is selected by publication year between 2008 and 2015 as shown in Figure 5.

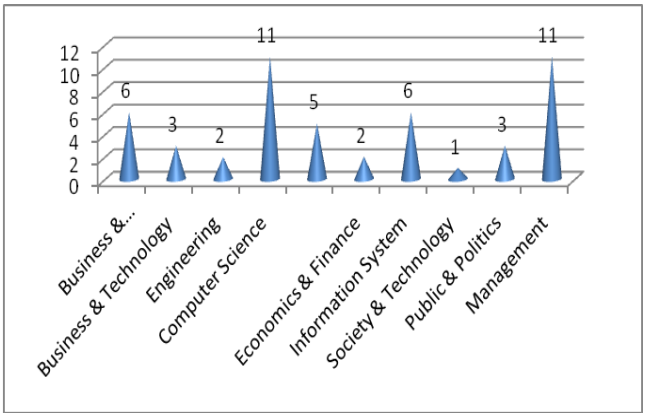

Figure 3: Author's Academic Background

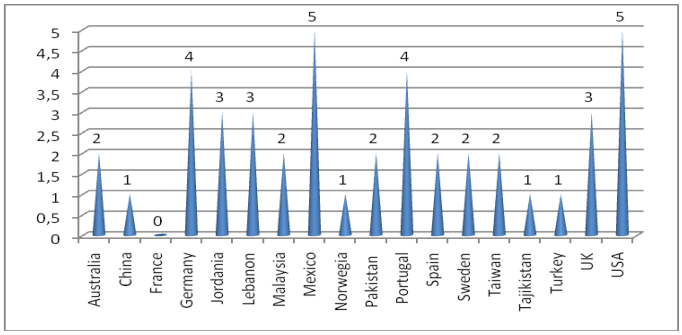

Figure 4: University in the country

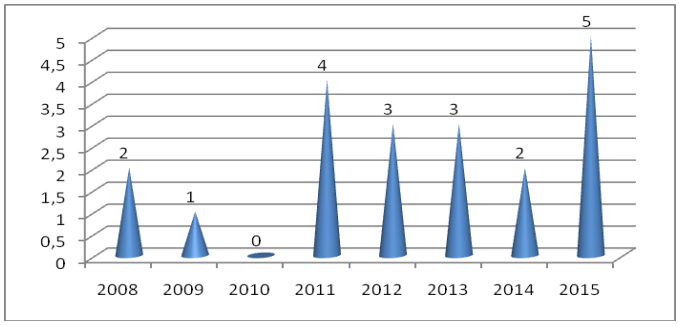

Figure 5: Publication Year

E. Participation Dimension

Participation dimension is divided into two, willingness and ability.

i. Willingness to participate

Willingness is a basic to learn a few things related to science and others. Willingness is also one factor that drives a person to do a thing in real life. Moreover, willingness is the driving force that comes from within. Encouragement can also be regarded as the will directed at specific purposes. Willingness can also be regarded as the ability to make free choices, decide, control ourselves, as well as to do act. Willingness makes someone to accept the rule of law and obligations. Willingness come from human driven by thoughts and feelings. Thus, willingness is power to lead oneself so that one is able to decide a case.

Reference [4] suggested that the willingness of the community is to participate actively in the development of a very large system. He stated that there are some things why people want to participate in the development of the system. Those are willingness to participate and satisfaction in the e-public services, and personal enticements, the availability of time, social commitment, and previous experience in the system construction.

ii. Ability to participate

Ability is the skill or potential of an individual to master the skill in doing or performing a variety of tasks in a job or an assessment of one's actions. Basically capability consists of two factors: intellectual ability and physical ability

Participatory Design approach is a collaboration solution produced by system developers and users [4]. Respondents who support the Participatory Design have the basic

knowledge. They should be involved in user interface design process. The citizen must have a basic knowledge of IT, which is skillfully using computer and actively using the Internet, to be involved in the development of the system.

F. Participation Factor Category

Hujran et. Al (2015) found strong evidence that the citizens' attitude towards the use of e-government service is decisive significantly factor in the willingness or purpose to adopt and to use the e-gov service.

There are four categories of participation factors according Hujran, namely technology, social, political, and culture. This explains the technologies used for e-public services and perceived by the citizens for their participation. Judging from the social categories it can be explained that the social background of the citizens include economics, education, etc. The political situation could affect government policies and community participation.

Reference [2] sets the various factors that influence the intention of citizens to use e-gov facilities with Gambian citizens as the sample.

The study result can be replicate in other African countries to get a complete picture of the important factors that affect the acceptance of e-gov on the citizens. So it will get a participation factor namely behavioral / culture. Cultural differences can be a barrier to the adoption of ICT and the use of the system.

People want to participate in the development of the system because they have the knowledge of the public authorities, IT, and system development.

G. Participation Factor

Reference [11] develops and validates the adoption of e-gov models to predict and explain the adoption behavior of people following the e-gov services. Ozkan S et al. (2011) found the factors that can explain the e-gov intentions which are beliefs, attitudes, and behaviors of controlling perception. These results provide useful insight for policy-makers and researchers in terms of e-government services.

Reference [13] states a crucial factor of the initiative e-participant successfulness' is the high saliency (assume that something is important), at least for one stakeholder. The saliency level also changes over time the project is underway

The systematic literature review resulted in two dimensions participation, namely willingness and ability. There are five categories of participation factor produced which are technological, social, political, cultural and behavioral.

This Systematic Literature Review resulted in 21 factors that affect the citizens' participation in the development of the system (see Table 2).

V. CONCLUSION

There are some factors found in this literature review that influence public participation in system development. This research on the public participation of e-services development can be categorized into two kinds of dimensions of the main issues, willingness and ability. These issues are significant because all the obtained factors must be have an element of willingness and ability. There are five categories of participation factor which are technology, social, cultural, political, and behavior. Each factor was mapping into categories of factors. With the advent of public participation, researchers need to understand the differences of participants' structure as it affects their social interaction.

For the future research there are many topics that requires Structure-Based approach, such as the impact of Internet usage and long-term system development in the public e-services. Significant question to be considered is the association between participation activity and financial success level of the community. Result of this study will gives benefit to Government to understanding the factors that influence citizen participation. Furthermore, it could build the more appropriate systems that fit into citizen's needs. For future research, it is advisable to understand the dimensions of the various forms of participation, to investigate the quality of participation and influence for public participation.

Table 1
List Factor

No	Factors	Factors Categorization
1	Knowledge about public authorities	Political
2	Knowledge about IT	Technological
3	Knowledge about systems development	Technological
4	Use of public e-service	Behavioral
5	Satisfaction of public e-service	Technological
6	Personal incentives	Behavioral
7	Available time	Behavioral
8	Social Commitment	Social
9	Earlier experience of systems development	Behavioral
10	Information systems quality	Technological
11	Information quality	Technological
12	Subjective norms	Behavioral
13	Attitude	Cultural
14	Trust	Social
15	Attitude	Cultural
16	Saliency	Cultural
17	Security and privacy	Technological
18	Accessibility	Technological
19	Awareness of public services	Behavioral
20	Quality of public	Behavioral
21	Social influence	Social

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