

Sosio-Technical Factors of E-Government Implementation

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Abstract – The failure of e-Government in a number of sector units happened because the implementation of e-Government is not easy. The old paradigm assume that e-Government is simply by installing a computer makes the implementation of e-Government failure. In fact, the success of e-Government is influenced by various factors called Critical Success Factors (CSFs). This study aims to map CSFs that influenced implementation of e-Government into two term of both technology and non-technology factors. The results showed a 67 CSFs of e-Government implementation identified was successfully mapped into seven dimensions ITPOSMO (Information, Technology, Process, Objective, Staffing & Skill, Management and Other Resource).

Keywords - e-Government, Implementation, CSFs, ITPOSMO, Qualitative

I. INTRODUCTION

The development of information and communication technology (ICT) has been so rapid that affect human life, especially the changing characteristics of relationships with people, businesses and even the government [1]. The presence of Information and Communication Technology (ICT) has changed the way of interaction between the government and the public and this has led to the development of a new phenomenon called the e-Government. Currently the world is towards the era of information society in which the needs and tuntutanakan information to be very high to be accessed, managed and utilized in large volumes quickly and accurately. This led the government to provide better service and transparency for the public by utilizing advances in Information and Communication Technology (ICT). To answer these challenges, the government should immediately implement the transformation process towards e-government. Through the process of transformation of terse-but, the government can optimize panorama-entry advances in information technology to eliminate the barriers of bureaucratic organization, and form a network management system and work process that allows government agencies to work in an integrated manner to simplify access to all the information and public services which should be provided by the government. Therefore, all state institutions, communities, businesses, and other interested parties can at any time take advantage of government information and services in an optimal [2]. Based on the World Bank (2009), e-Government is defined as the utilization of information technology by government agencies such as WAN, internet, mobile computing has the ability to transform relations with citizens, businesses and other government agencies [3]. The government uses Information and Communication Technology (ICT) in governance processes to improve the

efficiency, effectiveness, transparency and accountability in governance. Information and communication technologies (ICT) are modern as the Internet, mobile communication, wireless devices and the combination of other technologies used to implement the e-Government solutions [4]. The two main characteristics or criteria that must be contained in the e-Government system availability and accessibility [5]. First, services and e-Government transactions should be available 24 hours a day, 7 days a week (non-stop). Users are free to choose at any time concerned want to deal with the government to carry out various transactions or mechanisms of interaction. It allows communities and businesses with the flexibility to access government services outside working hours. Second, e-Government is highly dependent on the accessibility of the services available on the website. If the service can not be accessed, it can be said of e-Government will not succeed or fail. Based on Presidential Decree 3 of 2003 that the e-Government initiatives have been undertaken by many central and local government agencies in developing public services through a network of communication and information. However, the results of observations made by the Ministry of Communication and Information, a large part of new government institutions that are in the early stages of the development of e-Government information site creation. The low level of accessibility of government websites was shown by Hendriawan (2008) who reported that from 402 web sites at the local level, there are 65 sites that are not accessible, or 16% of the total existing site [6].

Even based on the results of a national survey by the Ministry of Communication and Information in the form of rankings of e-Government in Indonesia (PEGI) in 2012, there were only six local governments of the total 497 districts / cities based on data from the Ditjen Otda [7] which is considered to have successfully implemented e-

Government while at the provincial level, the implementation of e-Government still get bad average score [8]. If compared to other countries in the adoption of e-Government is based on an international survey Waseda e-Government ranking in 2012, Indonesia was far behind and is ranked 33 of 55 countries where e-Government. Based on the Waseda e-Government in 2015, Indonesia was ranked 29 out of 38 countries where e-Government [9]. In line with this, the rating of e-Government by the United Nations in 2014 at the ASEAN level shows Indonesia ranked 6 out of a total of 11 countries, far below Malaysia and Vietnam [10].

Based on the conditions put forward, it can be said that the implementation of e-Government in Indonesia is far from optimal and indicates compliance with these policies without quality. Yet it can not be denied, there are some areas that have the initiative and successfully implement e-Government. Defining CSF particularly in the implementation of e-Government will help organizations to avoid the failure of the project of e-Government [11]. By knowing the CSF, the organization can focus on a number of factors that can ensure the success of the organization [12]. This study would like to explore CSF of e-Government implementation both technical factors and non-technical factors (sosio-technical factors).

II. LITERATUR REVIEW

As explained, some governments showed initiative of e-Government implementation. But it is still lack of publications and information from best practice of e-Government that should be used as a reference for other government agencies in implementing e-Government. Some studies CSF conducted at the national level such as the study by Furuhold & Wahid identifies six critical success factors (CSFs) the implementation of e-Government, especially in Sragen the strong leadership, the involvement of all parties, preparation of human resources, imple-tion gradually, partnership building and regular evaluations [13]. In line with this, similar research conducted on five areas obtained at least 4 dominant factor supporting the success that is the political will of regional heads, master plan development of e-Government, change management and community participation [14]. In addition, there are many other researchers who have identified CSF related to the implementation of e-Government [4][15][16][17][18]. Overall CSFs was scattered in various journals and conference and does not provide a complete picture because of different contexts and object of research.

In the implementation of e-Government, there are various CSF that influence the success of e-Government. Based Heeks (2003), some of the factors that led to the failure in the implementation of e-Government, especially in developing countries that lack of internal drivers, lack of vision and strategy, poor project management, change management is bad, political domination and self-interest, the design of which is not realistic , lack the necessary

competence, inadequate infrastructure and technology incompatibility [19]. In addition, according Prasojo (2007), stated that 80% of the e-Government failure is due to non ICT element and only 20% were actually caused by ICT [20]. Though the problem on non-technological aspects are more often the cause of failure of e-Government in comparison with the technology aspect. Therefore, CSF is not only related to ICT but can be obtained from the social sciences, economics, politic, etc. so that the critical success factors (socio-technical) should be considered in the process of system development e-Government.

III. RESEARCH METHODOLOGY

The research methodology in this study has two main phase that to explore technical and non-technical (sosio-technical) factors of e-Government implementation in Indonesia which involve : a) qualitative approach called systematic review. Systematic review is a research method for the identification, evaluation and interpretation of all relevant research results related to specific research questions, specific topics, or the phenomenon of interest [21]. Studies of individuals individual study) is a form of primary studies (primary study), while systematic review is secondary studies (secondary study). Systematic review is a synthesis of research studies primer that presents a particular topic with the formulation of specific questions and clear, the search methods are explicit and reproducible, involves a process of critical examination in the selection of the study, and communicate the results and their implications. Thus systematic review would be very useful to integrate a variety of relevant research results, so that the facts presented to policy makers become more comprehensive and balanced.

In sequeential, the research process systematic reviews can be presented in Table 1 wherein the initial step of systematic review is to identify problems in the form of research questions in a clear, unambiguous and structured. Having defined the research questions developed Systematic review protocol. But the most important thing in the process is the selection of systematic review toward relevant research results or significantly related to the research question. Therefore, the selection of quality study becomes a crucial step in systematic review.

Table 1. Systematic Review Process [22]

Process Stage	Purpose
Identification of research questions	Transforming the problem into research questions
Developing research protocol of Systematic Review	Providing guidance in conducting Systematic Review
Determining the location of research results database as the search area	Providing the limitation of the search area for relevant research results
Selection of relevant research results	Collecting research results that are relevant to the research question
Choose quality research results	Conducting exclusion and inclusion towards the research that will be included in a systematic review based on the quality
Extraction of data from individual studies	Extraction of data from individual studies
Synthesis of the results with the meta-analysis method (if possible) or the narrative method (if not possible)	Synthesizing the results with the meta-analysis technique (forest plot) or narrative technique (meta-synthesis)
Presentation of results	Writing down the results in the report document of the systematic review result

b) Mapping the CSF into ITPOSMO (Information, Technology, Process, Objectives, Staffing & Skill, Management and Other Resources) model. ITPOSMO have been used in Bangkok [23][24][25] as shown in Figure 1

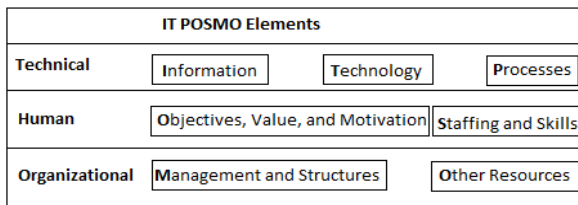


Fig 1. Elements of ITPOSMO [19]

Description of ITPOSMO model [23]:

1. Information (factors related to quality and prerequisites of system inputs and outputs);
2. Technology (factors such as the availability and compatibility of hardware and software);
3. Processes (alignment and integration between the system and existing/new processes to achieve stated objectives);
4. Objectives, Values, and Motivation (e.g. organization culture, guiding values);
5. Staffing and Skills (factors such as the availability of skilled personnel and adequacy of training provided for using the system);
6. Management and Structures (factors such as managerial practice and flexibility of organizational structures); and
7. Other Resources (money and time).

IV. RESULT AND DISCUSSION

There has been a lot of research done related to CSF implementation of e-Government but the overall CSF are still scattered in many journal articles and conference. So in the first phase, we conducted systematic review to synthesize various journals and conference in order to produce new sight of CSFs identified in the previous research. For example of synthesize process, For example, a study conducted by Gartner Group (2000) identified a CSF of "ICT Infrastructure", but in a study conducted Ibrahim & Elijah (2015) CSF are called "Basic Infrastructure" [26]. While research Nan Zhang et. al (2015), CSFs proposed is "technology" [27]. Although three of CSFs have different names but basically the meaning of the three is the same as "Basic Infrastructure of ICT". Thus we can do the synthesis to obtain new understanding of CSF of the three studies.

The above example is only from three articles publication. Once traced, there are still many journal articles or other conference has also formulated CSFs implementation of e-government system. In other words, the synthesis of a number of studies conducted on the current CSFs.

The systematic review in this study based on 52 articles which consists of 29 journal articles (Scopus) and 23 conference papers (IEEE Xplore). In this study, the researcher focus on a key concept of the success factors of e-Government implementation where there are 274 key concepts derived from the overall 52 existing studies. Each of the key concept of all studies can be given the identity of the form of numbers next to facilitate the translation process. Synthesizing process in this paper as defined above, also include 52 studies and 55 synthesized success factors that resulted from Napitupulu (2015) research. As the final result, 67 new CSFs concept as seen in Table 2 below. All of the success factor that depicted in have the same degree. No one is more important and less important, all of them are equal.

Table 2.
Critical Success Factors (CSFs) of
E-Government Implementation

No	Critical Success Factors (CSFs)
1	Participation of User & Stakeholder
2	Project Plan
3	System Accesibility
4	Reguler Training
5	Ease of Use
6	Website Promotion
7	Pilot Project
8	Skills and Expertise
9	E-Leadership
10	Project Coordination
11	Clear Guidance
12	Funding Continuity
13	Business Process Reengineering
14	E-Government Policy and Regulation
15	Stable Government
16	Outsourcing strategy
17	Basic Infrastructure of ICT
18	ICT Literacy
19	Organizational Structure
20	International Cooperation
21	Privacy & Security
22	Usefulness
23	Monitoring and evaluation
24	Private Partnership
25	Change Management Strategy
26	Sosio-Cultural
27	System Modeling
28	Top Management Support
29	System Actual Usage
30	Citizen Relationship Management
31	Compatibility
32	Project Management
33	Information Quality
34	System Quality
35	Service Reliability
36	Trust
37	Awareness
38	ICT Governance
39	Public Satisfaction
40	Methodology and Structure Approach
41	E-Transaction and E-Payment
42	User Friendly
43	Gradual Implementation
44	Re-Usable

45	Continuous Improvement
46	Service Innovation
47	Loyalty
48	Acknowledgement
49	Public Intention to Use
50	Sustainable Revenue
51	E-Participation
52	Roadmap
53	Market Sinergy
54	Political Pressure
55	Inter-Governmental Relationship
56	Tools and Equipment
57	E-Initiative
58	Vision
59	Citizen Empowerment
60	Knowledge Management System
61	Service Guarantee
62	Personalization of Service
63	Empathy
64	Flexibility of Technology
65	Alignment of Organization Goal and ICT direction
66	Good Responsiveness
67	E-Democracy

Based on Table 2 which CSFs list obtained, we will map each of CSFs into ITPOSMO model that could be seen in Table 3 below:

Table 3.
Mapping CSF Into ITPOSMO Model

Sosio-Techin Model ITPOSMO	Critical Success Factors (CSFs)
Information	Usefulness
	Awareness
	Ease of Use
	Privacy & Security
	System Actual Usage
	Project Plan
	Public Intention to Use
	User Friendly
	Public Satisfaction
	Awareness
	Methodology and Structure Approach
Technology	Basic Infrastructure of ICT
	E-Transaction & E-Payment
	Flexibility of Technology
	Tools & Equipment
	Service Reliability
	System Quality
	Compatibility
	System Modeling
	System Accesibility
	Personalization of Service
Process	Business Process Reengineering
	Alignment of Organization Goal and ICT direction
	E-Participation
	E-Democracy
	Knowledge Management System
	Continuous Improvenment
	Website Promotion
	Pilot Project
	Gradual Implementation
	Re-Usable
Objective, Value & Motivation	Good Responsiveness
	Trust
	Acknowledgement
	E-Initiative

	Sosio-Cultural
	Citizen Empowerment
	Empathy
	Loyalty
	E-Leadership
	Roadmap
	Clear Guidance
	Sustainable Revenue
	Service Guarantee
	Government Policy and Regulation
Staffing & Skills	Reguler Training
	Skills & Expertise
	Participation of User & Stakeholder
	Service Innovation
Management & Structure	ICT Literacy
	Change Management Strategy
	Top Management Support
	Project Management
	Vision
	Private Partnership
	Outsourcing Strategy
	International Cooperation
	Market Synergy
	Monitoring & Evaluation
	Organizational Structure
	Top Management Support
	Citizen Relationship Management
	Project Coordination
	Stable Government
	Political Pressure
	Inter-Governmental Relationship
Other Resources	Funding Continuity

Table 3 above showed that the result of mapping of each CSFs in e-Government implementation into seven dimension that is information dimension has 11 CSFs, technology dimension has 10 CSFs, process dimension has 10 factors, objective dimension has 14 success factors, staffing & skill dimension has 5 CSFs, management dimension has 16 CSFs and funding continuity was mapped into other resources. It could be seen from analysis that technical factors only consist of 10 CSFs but the rest of CSFs was mapped into non-technical factors which is more dominant than technical factors as in line with theoretical in previous study [4][15][19][23][27].

V. CONCLUSION

The study resulted a number of Critical Success Factors (CSFs) based on systematic review method which were mapped into ITPOSMO model to identify issues of information, technology, process, objective, staffing & skill, management & structure and other resources related to implementation of e-Government system. The finding of study is non-technical factors is more dominant than technical factors as in line with previous study. This study still needed further research to do empirical studies in order to test the validity and reliability of CSFs proposed.

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