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Abstract. E-Government is an information system implementation conducted by the government to improve the effectivity and efficiency of the governance. The applications to be developed in the e-Government must be able to be used and its usage shall give vast effects on the achievement of the civil service purposes. This article will discuss the analysis of the determinant criteria to be considered in the implementation of e-Government. The findings of this study are criteria that need to be considered in of e-Government, starting from the most important issue, namely: function; system security; user-friendliness; and application menu display. This research contributes to the establishment and assessment of the e-Government implementation criteria, which further will be used by the government or the software developers in designing the e-Government application.

1. Introduction

The continuance of the organization will be difficult to grow without the use of technology[1], where one of the uses of technology is the implementation of the information system[2]. In today context, the implementation of the information system has been one of the needs for an entity in running its activities. The information system is implemented to help an entity manage the business process and provide the information precisely, fast and accurately[3]–[7].

The same thing goes for the government as an entity that runs its business process to serve the public, where the information system for the government is known as the e-Government [8]. However, the use of the e-Government has yet to run optimally, this is allegedly due to trust issues from the public [9], data safety [10], human resources capacity, as well as the literation ability of the public in using the e-Government [11], the resistance of change, unsuitable and expensive infrastructure, and the limited access [12].

The implementation of e-Government basically connects the government stakeholders in one single information system, it can be in a form of Government to Citizen (G2C), Government to Business (G2B), Government to Government (G2G) [13]. The limitation in this article is on the G2C relationship, with analysis unit of the citizens' point of view. This article provides the study of the determinant aspects

in the G2C implementation in the e-Government that can further be used by the government or the software developer.

2. Methodology

The step of the research started at observing the problems of the e-Government implementation and the establishment of the criteria that are deemed to affect the implementation of the e-Government. Followed by the assessment by assessment approach based on the Multi-Criteria Decision Making (MCDM) model. This analysis is further connected with the problems regarding the value assessment on the determinant aspects in the implementation of the e-Government. The main procedure used in this research is the literature study, Focus Group Discussion (FGD), and the assessment analysis with utility model. The flow chart of the procedure can be seen in figure 1.
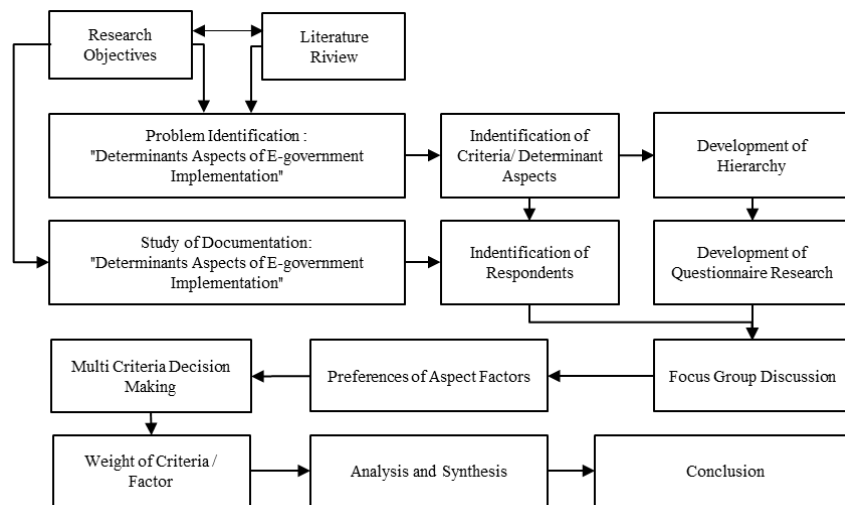
Figure 1. Procedures and Steps of the research.

3. Result and discussion

3.1. E-Government

E-Government is the usage of the information technology to improve the relationship between the government and other parties. The information technology is a medium and infrastructure (hardware software, human-ware), system and the methods to receive, send, manage, translate, save, organizing, and use the data meaningfully [14].

The presence of the e-Government is a necessity for the public in accordance with the government service transparency and speed towards the public [15]. The implementation of the e-Government gives significant benefits to the service and coordination function among the government institutions, so that the government service can run more effectively and efficiently, and the government will have a more accurate data source in the same platform [16].

The benefits of the e-Government usage [11]:

    a. To improve the quality of the government service towards the stakeholders (public, business groups, and industries) mainly in the means of performance effectivity and efficiency in various areas of nation life.

    b. To improve the transparency, control and accountability of the governance in order to apply the Good Corporate Governance concept.

    c. To reduce the budget of administration, relation and interaction borne by the government or the stakeholder for daily activities significantly.

d. To give chance for the government to gain new sources of income through its interaction with the related parties.
e. To create a new public environment that can quickly and accurately answer various problems faced along with the numerous global and trend changes.
f. To empower the public and other parties as the partners of the government in the process of the public policies decision-making democratically and evenly.
g. To create a higher quality of information-based citizens.

The implications of the e-Government implementation benefits, the e-Government is expected to fulfill the public's hope that can be measured with some of the following parameters:

a. The improvement of the public's satisfactory. Conceptually, the implementation of the e-Government is an effort of the government performance that will affect the public satisfactory (customers). This is in line with the opinion of Ramdhani et al. (2011) which stated that the performance of the organization positively and significantly affects the customers satisfactory [17].
b. The improvement of the public trust. This is in line with the result of the research conducted by Purwanto & Susanto (2018) which stated that the e-Government service affects public trust towards the government [9].
c. The effectivity and efficiency of the government through the availability of transparent, fast, precise, accurate, and accessible data.

3.2. The determinant factors in the implementation of the e-Government
The criteria value assessment set for the effectivity achievement of the Implementation of the e-Government is provided in table 1.

Table 1. Importance value of criteria and sub-criteria in the implementation of the e-Government.

Criteria	Weight	Sub-criteria	Weight
Function	0.527	Information display	0.159
		Data management	0.121
		Function running	0.191
		System control	0.056
User-friendliness	0.129	Information availability	0.081
		Procedure manual	0.031
		Dialogue menu	0.018
Security	0.241	Data safety	0.093
		Data confidentiality	0.107
		Virus-free	0.041
Application Menu Display	0.102	Attractive display	0.034
		Input control	0.014
		Readable input	0.054

3.2.1. Function. The technology designed and implemented on the e-Government is basically used to receive inputs, run models, save and access data, create output, and assist in controlling the system comprehensively. The function aspect holds the main role in the implementation of the e-Government with the value of 0.527. This is based on the main function of the e-Government as a tool for the government to run its function in serving the public.
Essentially, the functional needs of the e-Government [18] are as follows:

a. Standardization of the government sites template, including the feature choices and information to be displayed in the e-Government.

b. The provision of information in the chosen information feature.
c. The choice of service features to be owned by the government in accordance with the public's computer literacy level.
d. The provision of two-way communication facilities of the government and the public, such as voting facility, criticism-complaints, discussion forums and others.

3.2.2. User-friendliness. The technology design analysis on the e-Government is considered based on the type identification of the required technology and the number needed by the application packages. For the hardware technology, the determination of the technology type is based on the identification of the tools used in each process in the e-Government, while the determination of the software is based on the system requirement compared with the software performance in running the target of the e-Government implementation.

The user-friendliness is the most important consideration in the e-Government implementation with the value of 0.129. The arrangement of this criteria is based on: the completeness of information, manual procedure availability and dialogue menu that facilitates the public in using and utilizing the e-Government. Based on the customs and ownership of society on information technology devices, it is better for the technology design to be directed towards the smartphone-based application design, such as the use of Android-based application programs. The Android-based application has a good effectivity in running the information system functions [19][20]. The writers recommend the use of multimedia as a part of the user guide of the application, the multimedia use, based on various researchers, will be able to increase the effectivity of the information delivery [21]–[26].

The e-Government need to have an accessible dialogue menu with an attractive display, with a top-notched ability to run the following functions: (1) action language, including the device choices used the users to communicate with the system, such as the establishment of input devices into the system in the form of text boards, touch panels, voice commands and so on; (2) display or presentation, which displays the output of e-Government, which is displayed in the display screen in the form of text, graphics, sound, and so forth; and (3) knowledge base, e-Government needs to provide information that includes what users should know in order to use the system effectively. The knowledge base can be in the mind of the users, on the reference card or instruction, in the manual, and so on. The combination the above-mentioned abilities consist of what is called dialogue style[27].

3.2.3. System security. System security is an important factor in an electronic system. Data and information from users to the system and on the contrary constantly flowing need to be kept confidential [28]. Various business interests or criminal-motivated activities have an interest in the data in e-Government. An important factor in the implementation of E-Government as part of government services is to prioritize the security and confidentiality of the data and information contained within it. Based on the calculation, the weight of the data security criterion is 0.241.

Implementation of such e-Government and its widespread utilization potential, opens opportunities for the collection, management, accessing, and utilization of information in large volumes and precise and accurate[18]. Security elements of a data in e-Government is an important matter in maintaining the confidentiality of information. To keep the confidentiality of data feeding can be used a cryptographic algorithm that is integrated into e-Government [29]. E-Government should be designed so that the system is not easy to enter by hackers or viruses that will interfere with e-Government functions.

3.2.4. Application menu display. Discussion of this aspect can be explained that e-Government reflects the pattern of communication between the public and government, therefore the e-Government needs to be designed to provide interactive services. In the e-Government there needs to be intensive two-way communication between public and government. Moreover, the e-Government allows the public to submit questions, give a response and the computer system will provide feedback as fast as possible after the public give the response. This research gives a value of 0.102 on the display menu aspect of the application as the consideration in the design and implementation of the e-Government.

The strength that needs to be a characteristic of the e-Government is the interaction ability between the system and the users. To improve the interaction process, the stimuli procedure should be made in an attractive display design that can be provided through text, sound or graphic display that meet the good aesthetical rules.

4. Conclusion

E-Government is an activity undertaken by the government using information technology to provide services to the public. Based on the results of analysis and synthesis by using MCDM analysis, the criteria to be considered in the implementation, starting from the most important things, namely: function; system security; user-friendliness; and application menu display.

References

[1] M A Ramdhani, H Aulawi, A Ikhwana and Y Mauluddin 2017 Model of green technology adaptation in small and medium-sized tannery industry *J. Eng. Appl. Sci.* **12(**4) pp. 954–962

[2] H Aulawi, M A Ramdhani, C Slamet, H Ainissyifa and W Darmalaksana 2017 Functional Need Analysis of Knowledge Portal Design in Higher Education Institution *Int. Soft Comput.* **12**(2) pp. 132–141

[3] C Slamet, A Rahman, M A Ramdhani and W Darmalaksana 2016 Clustering the Verses of the Holy Qur'an Using K-Means Algorithm *Asian J. Inf. Technol.* **15**(24) pp. 5159–5162

[4] C Slamet, A Rahman, A Sutedi, W Darmalaksana, M A Ramdhani and D S Maylawati 2018 Social Media-Based Identifier for Natural Disaster *IOP Conf. Ser. Mater. Sci. Eng.* **288(**1) p. 012039

[5] Y A Gerhana, W B Zulfikar, A H Ramdani and M A.Ramdhani 2018 Implementation of Nearest Neighbor using HSV to Identify Skin Disease *IOP Conf. Ser. Mater. Sci. Eng.* **288**(1) p. 012153

[6] W B Zulfikar, Jumadi, P K Prasetyo and M A Ramdhani 2018 Implementation of Mamdani Fuzzy Method in Employee Promotion System *IOP Conf. Ser. Mater. Sci. Eng.* **288**(1) p. 012147

[7] C Slamet, R Andrian, D S Maylawati, W Darmalaksana and M A Ramdhani 2018 Web Scraping and Naïve Bayes Classification for Job Search Engine **288**(1) pp. 1–7

[8] A Pamoragung, K Suryadi and M A Ramdhani 2006 Enhancing the implementation of e-Government in indonesia through the high-quality of virtual community and knowledge portal in *Proceedings of the European Conference on e-Government ECEG* pp. 341–348

[9] A Purwanto and T D Susanto 2018 Pengaruh Dimensi Kepercayaan terhadap Adopsi Layanan E-Government in *Jurnal INFORM.* **3**(1)

[10] D Ciptaningrum, E Nugroho and D Adhipta 2015 Audit Keamanan Sistem Informasi pada Kantor Pemerintah Kota Yogyakarta menggunakan COBIT 5 in *Seminar Nasional Teknologi Informasi dan Komunikasi 2015 (SENTIKA 2015)*

[11] E A Sosiawan 2008 Tantangan dan Hambatan dalam implementasi E-Government di Indonesia in *Seminar Nasional Informatika (SEMNASIF)*

[12] Rosa A S and M Salahudin 2013 *Rekayasa Perangkat Lunak Terstruktur dan Berorientasi Objek* (Bandung:Informatika)

[13] H Alfariz and S Suyono 2017 E-Government Pemberdayaan Desa Sukoharjo 1 dan Potensi Desa Berbasis Web in *Prociding Konferensi Mahasiswa Sistem Informasi*

[14] M A Ramdhani and E R Wulan 2012 The Analysis of Determinant Factors In Software Design For Computer Assisted Instruction *Int. J. Sci. Technol. Res.* **1**(8) pp. 69–73, 2012

[15] O Oktafianto and L Yulita 2017 Perspektif Sosial dalam Implementasi E-Government: Studi Kasus Kabupaten Tanggamus *J. TAM Technol. Accept. Model* **3** pp. 48–53

[16] R Andreal and R Wati 2017 Upaya Pengembangan E-Government dalam Pelayanan Publik pada Dinas Koperasi dan UKM Kabupaten Tanggamus in *Prociding Konferensi Mahasiswa Sistem Informasi*

[17] M A Ramdhani, A Ramdhani and D M Kurniati 2011 The Influence of Service Quality toward

Customer Satisfaction of Islamic Sharia Bank *Aust. J. Basic Appl. Sci.* **5**(9) pp. 1099–1104

[18]   Z A Hasibuan and H B Santoso 2005 Standardisasi Aplikasi E-Government untuk Instansi Pemerintah in *Prosiding Konferensi Nasional Teknologi Informasi dan Komunikasi Indonesia ITB*

[19]   Sari, F S Irwansyah, I Farida and M A Ramdhani 2017 Using Android-Based Educational Game for Learning Colloid Material Using Android-Based Educational Game for Learning Colloid Material *J. Phys. Conf. Ser.* **895**(1) p. 012012

[20]   F S Irwansyah, Y M Yusuf, I Farida and M A Ramdhani 2018 Augmented Reality (AR) Technology on the Android Operating System in Chemistry Learning *IOP Conf. Ser. Mater. Sci. Eng.* **288**(1) p. 012068

[21]   R Aisyah, I A Zakiyah, I Farida and M A Ramdhani 2017 Learning Crude Oil by Using Scientific Literacy Comics *J. Phys. Conf. Ser*. **895**(1) p. 012011

[22]   I Helsy, Maryamah, I Farida and M A Ramdhani 2017 Volta-Based Cells Materials Chemical Multiple Representation to Improve Ability of Student Representation *J. Phys. Conf. Ser.* **895**(10 p. 012010

[23]   F S Irwansyah, I Lubab, I Farida and M A Ramdhani 2017 Designing Interactive Electronic Module in Chemistry Lessons *J. Phys. Conf. Ser.* **895**(1) p. 012009

[24]   I Farida, I Helsy, I Fitriani and M A Ramdhani 2018 Learning Material of Chemistry in High School Using Multiple Representations *IOP Conf. Ser. Mater. Sci. Eng.* **288**(1) p. 012078

[25]   S Sari, D M Aryana, C Z Subarkah and M A Ramdhani 2018 Multimedia Based on Scientific Approach for Periodic System of Element *IOP Conf. Ser. Mater. Sci. Eng.* **288**(1) p. 012137

[26]   F S Irwansyah, C Slamet and M A Ramdhani 2018 Analysis of Determinant Factors in Selecting Laboratory Equipment in Chemistry Education Experiment *Chem. Eng. Trans.* **63** pp. 793–798

[27]   K Suryadi and M A Ramdhani 2002 *Sistem Pendukung Keputusan* (Bandung: Remaja Rosdakarya)

[28]   A Purwidyasari and M Syafruddin 2017 Analisis Faktor-faktor yang Mempengaruhi Kepuasan Pengguna Layanan E-Government: Studi Kasus pada Modul Penerimaan Negara Generasi 2 *Diponegoro J. Account.* **6**(4) pp. 1–9

[29]   E Juliansyah 2017 Implementasi Algoritma Kriptografi RC-6 dalam Mengamankan Data Teks *J. Pelita Inform.* **16**(3) pp. 267–269