Analysis of the Factors that Affect the Implementation of E-Government in Indonesia

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Abstracts: The research had purpose to investigated further related to the factors which affecting the implementation of e-Government (e-Gov) within the Ministry of Communication and Informatics of the Republic of Indonesia. This research was designed by the Quantitative-Descriptive method through a causality approach. The sample for this study amounted to 104 respondents who were randomly selected by a simple random sampling technique. The data analysis method used was PLS-SEM to test the research hypothesis. The results strongly suggested that information technology and human resource had significantly positive impact on the implementation of e-Gov, both partially and simultaneously. The findings of this research also demonstrate that the provision of applications related to the main duties and functions of employees is necessary. In addition, solving problems that occur at work also is the most essential thing that should be done in implementing e-Gov.

Keywords: e-Government, Information technology, Human resources.

1. INTRODUCTION

Today, e-government has been popular and in line with the advancement of information and communication technology. Many countries are competing to implement e-government with strategies that can be adjusted to their respective socio-political and geographical conditions [1] that in the end are expect to improve the quality of government performance, especially in the scope of community or community services [2,3], so that it can provide benefits to its citizens and that is one way to realize good governance [4,5].

The achievement of good governance is required by implementing internet technology-based information networks within the central and regional government in an integrated manner which has become an important prerequisite for increasing transparency, accountability and public participation in various governmental activities that can improve public services, as well as increase the efficiency of regional autonomy implementation [6,7]. Basically, good governance can be said as the achievement of government conditions that can guarantee public interests/services in a balanced manner by involving cooperation between all members of parties (state, civil society, community organizations, and the private sector). The good governance paradigm emphasizes the importance of parallel institutional relations between government organizations and the society/public.

To manage good governance in order to increase the effectiveness and productivity of community services, it is required to apply e-Gov development policies as well as appropriate strategies [7]. The emergence of Presidential law No. 3 of 2003 concerning E-Gov is way to show that the government is serious to implementing E-Gov within the central government and regional governments to improve service quality that provided to the community/society [8]. This Presidential Instruction clearly states that e-Gov can realize a clean and transparent of government which actively responds to people's aspiration for transformation include by providing community services that fit to the idea of large-scale society within the country, which are reliable, trusted and also reachable interactively.

The accomplishment of (prime) standard of community services is one of characteristics of the good governance [7]. Public services performance strongly influences the quality of people's lives. Fixing the standard of community services can be done by decentralizing power to the regions to manage their community services

through the development of a reliable public service management system which needed by the regions to increase the welfare of its people [4]. Based on Law Number 25 of 2009 concerning Community Service, which has meaning of series of activities that aims to fulfill service needs in terms of goods, services or administrative services provided by public service providers [9].

In an effort to attain an excellent community service, the public administration should be conducted based on the general principles of good governance. The Ministry of Communication and Informatics has made a breakthrough to create a better quality of community services, by implementing e-government system because people want public services which are fast, effective, efficient, and straightforward. Through the use of e-government, it is expected that it can answer the demands for services which are desired by the public/community. By applying e-government, it will boost the performance for both private/public sector to government institutions [3], and between the government and society. E-government can also enhance the administrative process and provide good input for the government to increase the standard of community service.

Several previous research had stated that the proper implementation of e-government must be supported by information technology and the competence as well as the qualified of human resources [10,11]. Furthermore, Probowolan also revealed that the more sophisticated the government-run system, the higher the quality of human resources owned by the government, and the better the implementation of e-government in providing public services to the wider community [11]. In contrast to the studies which mentioned earlier, Antonio and Husain explained that HR did not significantly affect the implementation of e-government [12,13]. Other studies also describe that information technology has an influence on increasing e-government implementation [14,15], while human resources do not [14].

There are so many phenomena occurred regarding the important role of implementing e-government that is in line with the advancement of information and communication technology. Several research gaps related to the role of information technology and human resources in implementing e-government which driven the author's interested to analyze further regarding the implementation of e-government that is influenced by information technology and human resources, especially those are which occurred at the Ministry of Communication and Informatics of the Republic of Indonesia, considering that the ministry is an institution which prioritizes the application of technology in all lines. By conducting this research, it is hoped that it will become a renewal of research in which elements of information technology are examined in the technology infrastructure and application systems used by involving the role of competence and human resource performance in applying e-government so that it can provide more benefits to the organization, and it is expected to provide excellent input to the government in general and to the Ministry of Communication and Informatics of the Republic of Indonesia in particular to implement appropriate information technology through the support of human resources in these institutions.

2. MATERIALS AND METHODS

The method used in this study was a quantitative descriptive with a causality approach to determine the connection between the variables which were examined in this study [16,17]. This research aimed to identify and build an overview regarding the implementation of e-government in the Ministry of Communication and Informatics of the Republic of Indonesia. The objects and units of analysis used in this study are employees of the Ministry of Communication and Informatics of the Republic of Indonesia, both State Civil Apparatus and Non-Civil Apparatus Employees, which are divided into 8 (eight) Echelon 1 Units that are closely related to the use of information technology-based government services.

The method used to collected data was carried out by the cross-sectional method which was then selected for one period [18], namely from January 2022 to January 2023. To examine all the problems that exist in the study, the authors perform direct field surveys through observation, interviews, and distribution of questionnaires [19,20]. The questionnaire was presented in the form of a Likert scale of 1 to 5 which was then distributed to 104 respondents using the sampling technique through simple random sampling to employees of the Ministry of Communication and Informatics of the Republic of Indonesia which were divided into 8 Echelon 1 Units. Furthermore, the data that was

obtained from the questionnaires was processed and analyzed using PLS-SEM as a data analysis method to reveal the correlation between variables and validate the research hypotheses.

This research is the development of a research model that has been carried out by Agustina [10]. Research variables which studied in this research include information technology variables that consist of technology infrastructure and application systems; human resource variables that are identified through the competence and performance of human resources and e-government variables. Information technology and human resources variables in this study act as independent variables, while the e-government acts as the dependent variable. The framework model of this study can be seen from Figure 1.
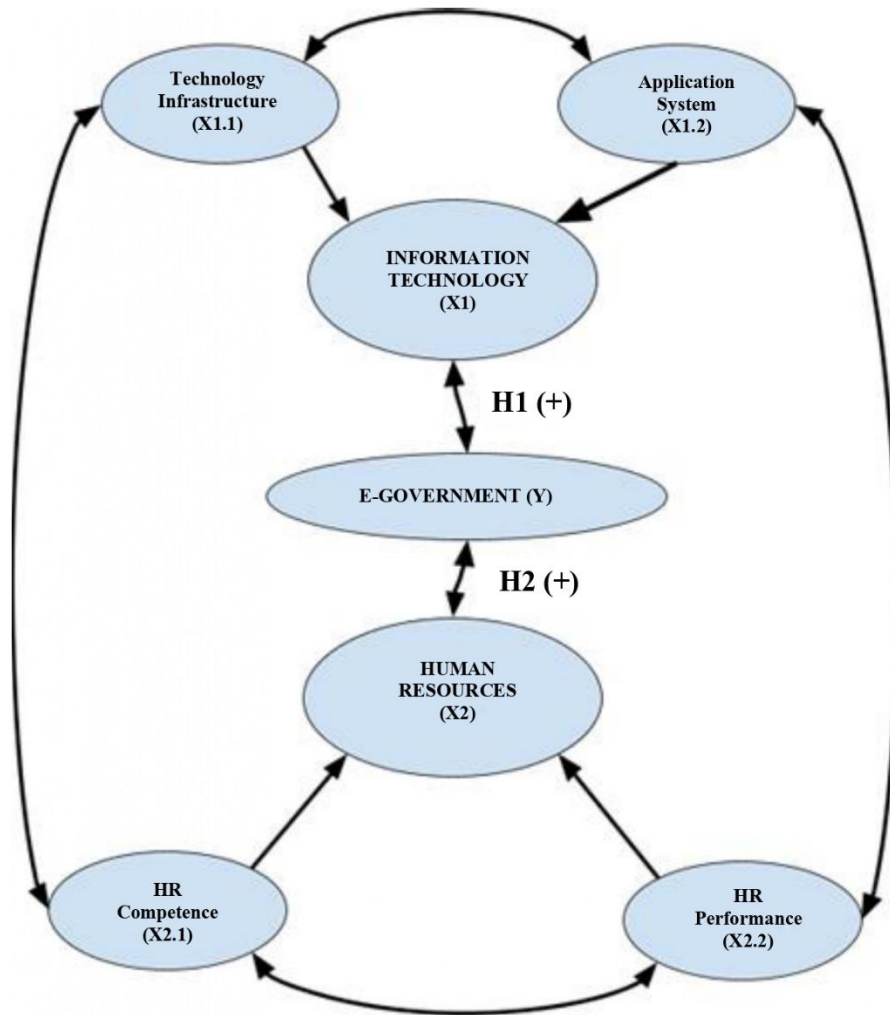

Figure 1. Presents the Research Framework Model.

2.1. E-Government

E-government is referred to two-way interaction between the society and the government as well as interested group related to increasing community services that are accountable, transparent, efficient and effective [10]. E-government also can be interpreted as the government's efforts to use information technology as way of communication between government, community, business actors and related parties in serving proper and fast services [21]. E-government has capacity to establish a new mode of community service in which all public organizations provide modern, integrated and seamless services to their people [22]. E-government is conceptualized of the utilize of information and communication technology mixed with organizational transformation to supported the government structure and operations [23]. By implementing e-government, it is expected to help

government to deliver an excellent service and bring the connection between people, businesses actors, and other government organizations to the next level [24].

2.2. Information Technology

Information technology is any technology or tool that helps humans in creating, changing, storing, communicating and disseminating information in all forms [25,26]. In addition, information technology is referred to collaborate system between telecommunications and computer technology with others, such as hardware, software, network technology, as well as databases that are used to build up organization information systems to deliver information for users in the decision-making process [27]. In line with Aminuddin's opinion [27], William & Sawyer, who explained that information technology is a mixing between computer technology and high-speed communication system [28]. Furthermore, information technology in its development is divided into 6 (six) groups, namely communication technology, input technology, output technology, software technology, storage technology, and processing technology [29].

In this study, information technology varies into 2 (two) dimensions, namely information technology infrastructure and application systems.According to Suyanto, the information technology infrastructure is referring to a set of services that cover all services provided and consist of human and technical capabilities [30]. Information technology infrastructure is closely related to information system services provided by an entity, whereas the information technology infrastructure has an important role in carrying out activities and supporting the achievement of the entity's general goals. The paradigm of information technology infrastructure includes not only hardware but also software [31]. On the other hand, the Information Technology infrastructure includes an investment in hardware, software, and services such as consulting, education, and training that are shared across the organizations [32]. In Indonesia, the assessment of the implementation of e-government using the 5 dimensions which put up by Indonesian e-government capita rating (PeGI) which performed by the Ministry of Communication and Informatics. These 5 dimensions consist of policies, institutions, infrastructure, applications and planning [33], where there are 2 dimensions, namely infrastructure and applications related to information and communication technology [34]. This means that sufficient information technology infrastructure and its regular quality maintain on implementing e-government is necessary.

Beside that, information technology infrastructure, the second dimension of information technology in this study is the application system. A system is referred to a network of procedures that are interconnected, gathered together to carry out an activity or complete certain goal [35]. A system can be said as a network of procedures that are interconnected, gathered together to carry out activities or to reach certain goals [36]. While the application is a program created by the user which aims to perform a specific task [37]. Applications can be interpreted as a special set of instructions in a computer that is designed to complete certain tasks. Programs in an application are ready-made programs or programs that are designed to carry out a function for other users or applications, which are called application systems.

2.3. Human Resources

Human resource is potentials that is in form of assets and function as capital (non-material) in business terms that can manifest into real potential physically and non-physically in realizing the existence of the organization [38]. In other words, human resource also defined as something both individuals and groups which assist organizations to earn goods or services [39]. Human resource is sees as essential capital in every organization. Without human resource, the wheels of the organization will not move. Without individuals who have expertise or are competent, it is impossible for organizations to achieve goals [40].

In this study, human resource variable has 2 (two) dimensions, namely human resource competence and human resource performance. Competence is capability, capacity and skills that owned by person so they can perform certain cognitive, affective, and psychomotor behavior [41]. Competence is a characteristic that underlies a person related to effectivity of individual performance at work or fundamental criteria of individuals who have a

causal relationship that used as a reference, effective and excellent or lofty performance at work [42]. According to Perrin's study, human resource competence includes computer skills, broad knowledge of vision, capacity to prevent the influences of change and expertise to served education regarding human resource [43]. Competence level is needed in order to know the level of performance expected for good or average category. Determining the required competency threshold will certainly be useful as a standard of selection process, succession, planning succession, performance evaluation, and human resource development.

The second variable of human resource dimension is human resource performance. Excellent human resource performance is factor that should be considered by organizations in boosting the organization's service system [44]. The performance of human resources can be said as the result of effort, ability, and perception of the task. Performance can be defined as the result of work in terms of quality and quantity that an employee can achieve in carrying out tasks under the responsibilities that are assigned to them [45]. The performance of human resource also referred as outcome result of someone's efforts, which accomplished by possessed any skill and actions in certain situations Kimsean argues if there are 4 (four) indicators to measure human resource performance, namely working on a timely basis, carrying out tasks according to procedures, completing assigned tasks properly, and meeting its qualification standards [47]. Furthermore, Kimsean also stated that human resources are essential for the development of good governance [47], so further studies related to the development and implementing e-government are needed.

2.4. Research Hypothesis

Based on the description of phenomena above, theories and concepts related to applying e-government, as well as the framework model which developed from this research, create several hypotheses that will be tested in this study, namely:

H_1: Information technology has an effect on implementing e-government

H_2: HR has an effect on implementing e-government.

3. RESULTS

Referring to questionnaire results, mostly respondents worked at the general secretariat unit with a percentage of 55%, aged between 20–30 years (80%), had a working period of 0–5 years (83%), with a diploma in education level (67%), with general functional civil servant status. Through these characteristics, it can be concluded that most respondents are in the productive age range and have a broad insight of technology / technology literacy, but did not have sufficient experience in their field of work, so they still need good guidance and direction to optimize their competence and performance, particularly regarding the application of information technology in implementing e-government which will affect on providing excellent service to the society.

The examination through PLS-SEM also uses assessment tool and structural models. The evaluation of the measurement model was conducted to examine the research instrument by assessing the validity and reliability of the data, whilst the evaluation of the structural model was used to assess the suitability of the model and to examine research hypothesis [16,20,48,49]. The examination of research instruments was performed by confirmatory factor analysis techniques, through examining the convergent and discriminant validity, as well as composite reliability [20,49]. Referring to the test results using convergent validity, the loading factor value which was obtained exceeds 0.7, so it can be said that this research model fits the requirements [16,20,48,49]. Then, by conducting discriminant validity through the cross loading approach, the outcomes show that the correlation of the construct with the research indicators has a greater value than the correlation value with other constructs. The test also got an AVE value which is higher than 0.5. From cross loading results and AVE, it is concluded that the model fit to criteria / rules of discriminant validity [16,20,48,49]. In the last instrument test using composite reliability, it is said that composite reliability and cronbach's alpha values contained more than 0.7, so we can declare that the model as reliable [16,20,48,49].

Tabel 1. Presents the Summary of Measurement Model Results.

Variable and items	Loading	AVE	Cronbach's alpha	Composite reliability	X1	X2	Y
Information Technology (X1)							
X1.1	0.866	0.766	0.956	0.963	0.866	0.679	0.687
X1.2	0.882				0.882	0.700	0.726
X1.3	0.886				0.886	0.730	0.760
X1.4	0.849				0.849	0.658	0.700
X1.5	0.876				0.876	0.661	0.711
X1.6	0.901				0.901	0.659	0.747
X1.7	0.888				0.888	0.726	0.794
X1.8	0.853				0.853	0.669	0.793
Human Resources (X2)							
X2.1	0.742	0.672	0.930	0.942	0.539	0.742	0.678
X2.2	0.828				0.632	0.828	0.692
X2.3	0.756				0.566	0.756	0.615
X2.4	0.843				0.622	0.843	0.706
X2.5	0.801				0.672	0.801	0.618
X2.6	0.883				0.730	0.883	0.701
X2.7	0.861				0.687	0.861	0.707
X2.8	0.833				0.685	0.833	0.668
E-Government (Y)							
Y1.1	0.890	0.752	0.835	0.942	0.742	0.677	0.890
Y1.2	0.860				0.732	0.722	0.860
Y1.3	0.851				0.731	0.741	0.851

Structural evaluation in this study was performed by the multicollinearity test, f-square, R-square, GoF, and bootstrapping model estimation [16,17,20]. According to the multicollinearity test results, it is found that all research indicators had a VIF value of less than 10. Or in other word, none of multicollinearity symptoms had been occurred in this research model [19,48]. Moreover, to assess the significance of the correlation between variables, a researcher performed an f-square test [50]. And based on the results of the f-square test, it was obtained the value of f-square for variables X1 and X2 were 0.489 and 0.303. Meaning that the independent variables in this study have a large effect size or have a strong and significant relationship to its dependent variable [48]. From the evaluation of structural models, apart from using f-square, it is also necessary to examine the value of R-square, that function was to determine the amount of dependent variable if it can be explained by the independent variables [19,49]. Quoted from the R-square results, it appears if the independent variables in this study, namely X1 and X2, have impact of 77.9% on variable Y, while the rest of 22.1% were affected by variables which are excluded from this research.

Tabel 2. Presents the Summary of Structural Model Results.

Constructs	VIF	R Square	R Square Adjusted	f-Square	Estimated Model
Information Technology	3.402 to 4.659			0.489	
Human Resources	1.994 to 4.391			0.303	
E-Government	1.809 to 2.269	0.783	0.779		
Fit Model					
SRMR					0.057
Chi-Square					370.815
NFI					0.817

The next examination that should have been done in evaluating the structural model in this study was the goodness of fit (GoF) model were examined through the use of SRMR, Chi-Square, and NFI And according to the GOF results, it is found that the value of SRMR was 0.057 or less than 0.10 (which is required), by means the SRMR value is good [48,51]. Based on Chi-Square test, the value of Chi-Square was 370.815, so we can say that the effect of the model is good because its value is smaller than 2000 [17,19]. Furthermore, the NFI test obtained an NFI value of 0.817 < 0.9, so the NFI value cannot be said as good because of its value, which is small by the specified criteria [52]. From these three tests, it is known that 2 of 3 tests have met the goodness of fit requirements, so it can be interpreted that the models are considered to have reached the requirements [17,48,49].

From the hypothesis test, the criteria which are seen in the path analysis are the original sample, t-statistics, and p-value. The required original sample value is -1 to +1. It is said to be positively related if the value is close to +1 and, if the value is close to -1 by means negatively related [17,49]. From the t-statistics criteria, the value received should be higher than the t-table (1.98) with an alpha level of 0.05 [20,48]. Then, the p-value criterion can be said to be significant if the value is below 0.05 [16,48].

Table 3. Illustrates the Significance Test Results.

Hypothesis	Original Sample (O)	T Statistics (|O/STDEV|)	P Values	Results
H-1: Information technology directly affects e-government	0.524	3.417	0.001	Supported
H-2: Human resources directly affects e-government	0.412	2.649	0.008	Supported

Elicited from the significance of test result, it can be said that both hypotheses are accepted. This indicate by the t-statistic value > 1.98 and p-value <0.05 with a positive direction (original sample close to +1), it can be concluded that these two independent variables (IT and HR) have a significant positive effect on the dependent variable (e-government). And judging from the significance of test results, it is also recognized that IT has a higher influence in improving e-government compared to human resources because it has a larger original sample value (0.524 > 0.412).

4. DISCUSSION AND CONCLUSION

According to the significant test results, it can be seen that IT has a significantly positive impact on implementing e-government. By means information technology plays an effective role in improving the realization of e-government at the Ministry of Communication and Informatics. These results were supported by the research conducted by Agustina [10], and Probowulan [11] who conveyed that the implementation of e-government should be supported by sufficient and qualified information technology and systems. These findings shows that the need to implement and integrate application systems with e-government. Through the existence of an application system that is integrated with the needs of the community, employees of the Ministry of Communication and Informatics can quickly assist the complaints and needs desired by the community itself, which in turn will make it easier for employees to conduct the task force that assigned to them [37], in order to achieve the goals of the organization in particular and the government in general.

According to the significant test results, it can be seen that human resources has a significant positive effect on the implementation of e-government, by means that human resource is effective in improving the implementing of e-government at the Ministry of Communication and Informatics. These results were supported the research by Agustina [10], as well as Probowulan [11] which explained if the better the quality of human resource in an organization, the better the implementation of e-government in providing public services to the public. These findings show that the role of human resources is still needed for every line in many business or industrial fields, including at the Ministry of Communication and informatics. Through qualified and competent human resources, it will be easier for organizations to manage existing resources in the organization [53], including the implementation of e-government, which will encourage the effectiveness of work of the employees themselves. Through the high-performance of human resources, it will make it easier for organizations to implement other support systems that can benefit society as a whole.

Summarized by the tests and analysis results, it can be concluded that information technology and human resources have an effect on improving e-government. Information technology has a higher influence on improving e-government than human resources. The highest value earned by the application system of information technology variables. Providing applications related to the primary duties and functions of employees can be seen as the most important thing to do. As for human resource variable, human resource performance earned the higher point with indicators of solving problems which occur at work can be the most essential thing to do in implementing e-government. As for e-government variable that most widely approved is the implementation of e-government that makes data and information are easier to access.

Based on these conclusions, the authors have several suggestions for the Ministry of Communication and Informatics, such as 1) need to create an application system that can bridge employees in completing their tasks and work which is integrated with community services, therefore the employee functions in organization can be more optimal that affect on the application of e-government in every line of department at the Ministry of Communication and Informatics and those problems faced by the community in terms of public services can be resolved quickly and accurate 2) Improving the performance of human resources by conducting performance evaluations and assessments which integrated with information systems according to their fields of work, so the employees can be assisted in solving work problems according to their respective fields more quickly and efficiently and certainly bring an impact towards implementing e-government 3) Create and design e-government application system that is easier to access and convenient to use by employees in all age groups by implementing application features that are easy to use and understand and without taking long time to access approval from each department and 4) For the next researchers are advised to continue to explore further regarding the use of information technology in manufacturing and non-manufacturing companies by involving other variables such as e-service quality, e-recovery, convenient to use connecting them with e-performance in these applications, and therefore it will produce more in-depth research related to the advancement of information technology that growth rapidly these days.

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