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Literature Study of Electronic Government Implementation in the Perspective of Indonesia's Electronic Government Ranking Dimensions

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Abstract: The Indonesian e-Government index for 2020 is internationally ranked 88, up 19 points from the previous ranking of 107 in 2018. This increase results from e-Government implementing agencies and an increase in public participation and contributions from research institutions. It always contributes to e-Government issues theoretically and practically. The results of studies related to the implementation of e-Government are also needed to answer the current problems and become a reference of e-Government development following Indonesian conditions. This study explores the studies that have been carried out during the last five years using the perspective of Indonesia's e-Government Ranking (PeGI), namely the dimensions of policy, institutional, application, infrastructure, and planning. The study used a literature review method with data sources obtained on the Garuda Ristek portal BRIN-Indonesian Publication Index. The number of articles collected was 45 articles which were then grouped based on the PeGI dimension, research methods, and types of e-Government relations. The results show that the perspective of the dimensions of the Indonesian e-Government Ranking can be a reference to see a picture of the conditions of e-Government implementation and the influencing factors. Furthermore, studies related to e-government issues can provide input information and recommendations for solutions to e-Government administrators. Therefore, it is necessary to increase the number of studies on e-Government in Indonesia supported by the government and related institutions to improve the quality of Indonesian e-Government.

Keywords: electronic government; implementation; Indonesia's e-Government ranking dimension

1. Introduction

The use of information and communication technology in the implementation of governance in Indonesia is not new. The era of globalization demands that the public sector and the private sector integrate technology into its existence. In the current era of globalization, Indonesian society demands increased accountability, transparency, and community participation (Zuhro, 2010). E-Government is one of the applications of information technology to realize more professional government services and support the industrial revolution 4.0 (Wirawan, 2020).

In 2020, the implementation of e-Government in Indonesia showed an increase. The results of a survey by the United Nations (UN) through the Ministry of Economics and Social Relations (DESA) of its member countries show that Indonesia is ranked 88th out of 193 countries, behind Malaysia, which is ranked 47th (United Nations, 2020; United Nations Department of Economic and Social Affairs, 2020).

The lack of contribution from research and development institutions in providing various inputs to optimize the implementation of e-government is one of the reasons why its development in Indonesia does not show a positive trend as the results of research suggest that in efforts to develop e-government in Indonesia, the number of studies and research on e-Government is still lacking (Masyhur, 2017).

The results of studies related to the development of e-Government are also needed to answer the problems that have existed so far and become a reference in formulating the direction and model of e-Government development following Indonesian conditions. Therefore, this study aims to explore and examine the research results with the theme of e-Government in Indonesia and see the need for further studies in the context of e-Government. So that studies with the theme of e-Government are in line with the requirements of policymakers, especially the government. Literature studies like this are important for further research needs (Wahyudin & Hasibuan, 2015), including finding out the position of a study and see the potential and trends of research on specific themes in the future (Masyhur, 2017).

Many people think that e-Government is just a matter of technology, even though non-technological factors also influence it, even becoming more dominant. Without a comprehensive evaluation covering non-technological aspects, e-Government implementation will fail (Napitupulu, 2017).

This study examines how the implementation and the factors that influence the implementation of e-Government using the Indonesian e-Government Rating dimension, which is the standard in assessing the implementation of e-Government in Indonesia. The dimensions used are policy, institutional, infrastructure, application, and planning. The five dimensions quoted from the website of the Directorate of e-Government of the Ministry of Communications and Information Technology have been used (Masyhur, 2017) to examine quantitatively the number of studies related to e-government, and previously (Hernikawati & Sensuse, 2016) has also conducted research to test the validity of indicators in the PeGI dimension.

2. Methods

The research is exploratory research conducted to explore data and information on new topics or issues to deepen or further study. The research objective is to formulate more accurate questions answered in further research or later research. The researcher usually uses exploratory research to gain sufficient knowledge in designing and conducting more systematic follow-up studies.

Exploratory research is generally carried out to answer the question "What" (What exactly is this phenomenon?). The purpose of this exploratory research is to map and examine the issues of various research results with the theme of e-Government from the perspective of 5 dimensions of the Indonesian e-Government Rating (PeGI). PeGI is considered relevant because these dimensions are used in assessing the effectiveness of the development and utilization of ICT in the government environment in Indonesia (Masyhur, 2017). The research question is how are the

results of e-Government research in Indonesia from the perspective of the PeGI dimension? What issues are influencing factors in each dimension?

This study determined that the source of information resulted from research related to e-Government taken from the Indonesian Publication Index website with the website address https://garuda.ristekbrin.go.id/. The Garuda Portal is a gateway for searching, indexing, abstracting, monitoring, and improving the quality standards of scientific publications in Indonesia, which is managed by the National Research and Innovation Agency of the Ministry of Research and Technology. Currently, there are 40 subjects, 160 conferences, and 11,976 journals with a total of 1,329,437 articles (https://garuda.ristekbrin.go.id/).

The study used a literature review, where a literature review is a research methodology that aims to collect and extract the essence of previous research and analyze several overviews of experts written in the text (Snyder, 2019). A literature review has a role as a foundation for various types of research because the results of a literature review provide an understanding of the development of knowledge, a source of stimulus for policymaking, trigger the creation of new ideas, and are useful as a guide for research in a particular field (Snyder, 2019).

The research begins by setting search keywords, then searching for data through a predetermined search engine application. Based on a brief review (title, abstract, and conclusions) of each particle taken, the data were grouped based on the five dimensions of PeGI and the research method used. Data not related to the five groups were not included. The keywords set are "electronic government," "electronic government Indonesia," "Electronic-Based Government System." The research period is set to be between 2015 and 2020.

In searching with these predetermined keywords, 45 articles were found, grouped based on these dimensions. Articles not related to these dimensions were then excluded so that 42 articles were obtained for analysis.

The next step was to analyze each dimension to look at the issues studied by the researcher. The method was conducted to group research results and map various issues of e-Government research in Indonesia from the PeGI perspective used in this study. The last is compiling a research conclusion that answers research questions about the results of e-Government research in Indonesia based on the dimensions of PeGI and the factors that influence research issues in each dimension.

3. Results and Discussion

3.1. Indonesia's e-Government Ranking

The ranking of e-Government in Indonesia, carried out by the Directorate of e-Government, can provide an overview of the extent of e-Government implementation in Indonesia or as a general description of the status and condition of e-Government in Indonesia, while the main objective of PeGI is as a comprehensive, balanced and objective evaluation so that it can provide a reference for the use and development of information and communication technology (ICT) within government agencies. Nationally, PeGi can give information on maps of the condition of the use of ICT in government agencies (Hernikawati & Sensuse, 2016).

In general, the dimensions and indicators of PeGI that have been used by Hernikawati and Sensuse (2016) and Masyhur (2017) in his research, namely: 1) Policy dimensions, related to regulations, strategic plans, work programs, technical guidelines and implementation instructions for the implementation and development of e-government; 2) The institutional dimension, related to the existence of an organization that has the authority and responsibility in the implementation and development of ICT, standard operating procedures (SOP), and the availability of human resources along with ICT HR development programs; 3) The infrastructure dimension, related to the existence of supporting facilities and infrastructure for the use and development of ICT, communication networks, and maintenance of ICT infrastructure; 4) Application dimensions, related to application software functions

that support the utilization and development of ICT, and application interoperability; and 5) Planning dimension, related to how to manage and manage integrated and sustainable ICT planning.

3.2. Number of Indonesian e-Government Research

Based on the data search results through the Garuda Portal (https://garuda.ristekbrin.go.id/) with predetermined keywords, 45 articles were found, with 42 articles related to the rest not related to the specified dimensions. From 42 articles, 18 articles contained issues related to the policy dimension, 24 articles contained issues related to the institutional dimension, 13 articles related to the application dimension, 15 articles related to infrastructure, and 15 articles related to the planning dimension. The researcher found that in several articles, there were several issues related to the dimensions of PeGI at once.
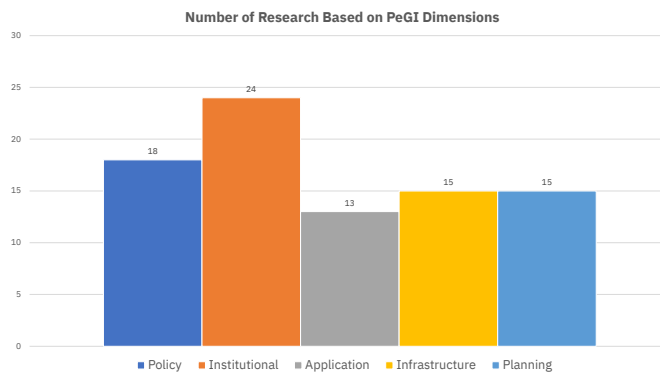

Figure 1. Number of Research-Based on PeGI Dimensions

Then from the selected articles, the researcher got an idea that as many as 29 (69%) articles use case study research methods, 5 (12%) articles use surveys, 5 (12%) articles use experiments, and 3 (7%) articles use literature review. It can be said that the case study method was the most widely used by researchers in assessing e-government. The choice of this method was alleged because the researchers intend to study e-Government topics specifically related to the locus of study where the research is carried out concerning local government and society. The research results using the case method cannot be used as a reference considering the object of analysis, namely government institutions and the community have different characteristics and needs. However, the results can enrich the discussion and provide an overview of issues and matters relating to the implementation of e-Government.
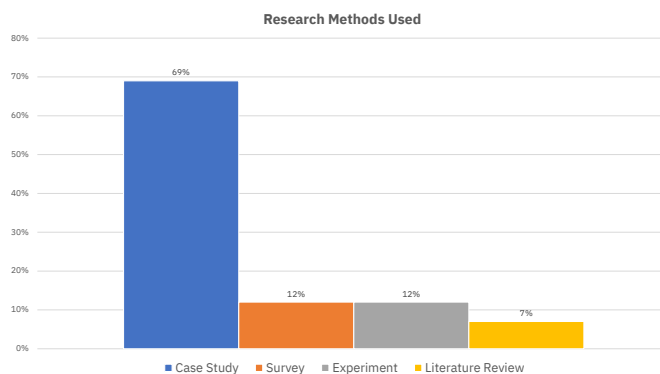

Figure 2. Research Methods Used

Then from the 42 articles selected according to the criteria for the relevance of issues to the PeGI dimension, the researcher get an overview of several types of e-Government relationships that are studied or mentioned in the research, namely several 12 articles related to the kinds of e-Government relationships including

Government to Government (G2G), six related articles Government to Employee (G2E), 24 articles related to Government to Citizen (G2C), and six articles related to Government to Business (G2B).
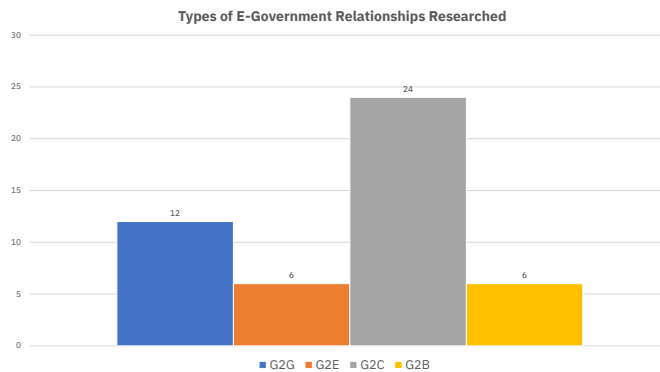

Figure 3. Types of E-Government Relationships Researched

3.3. E-Government Issues on the PeGI Dimensional Perspective

3.3.1. Policy

There is a total of 18 articles related to the policy issues. The issues mentioned in the research include the low policy index on e-Government services (Bouty et al., 2019), so it can be said that the implementation of e-government policies has become a critical factor. The obstacle faced in the implementation of e-Government is the lack of strong legal protection in the implementation of e-Government (Batubara & Helmy, 2000). Apart from that, there is no regulation at the service level (Puspa & Hariani, 2017).

It is important to have a policy or regulation because it is a supporting factor in implementing e-Government (Triprastiwi & Niswah, 2020). Although in some areas, there have been policies and regulations related to e-Government, the regulations at the local government level are hampered by a lack of understanding about the implementation of e-Government itself (N. O. I. Putri & Warsono, 2018).

In observing the obstacles, supporting and inhibiting factors, it is recommended that in implementing e-Government, a framework is needed in a law (Anugrah, 2020). In other words, strong legal protection is needed (Ulfa, 2018), the contents must be more detailed related to the application of e-Government (Batubara & Helmy, 2000). The presence of regulations is influenced by the government's commitment (Nasrullah, 2017). Regulation is needed when preparing e-government and its development; regulation is needed (Muliadi, 2015). Even up to the village government level, regulations are needed that are intended not only for the government but also for the community (Sulismadi et al., 2017). Details of regulations that accommodate how the application of e-Government is needed, including regulations in giving authority to service domains based on e-Government (Nurhayati et al., 2019; Pranalia, 2015).

From various studies related to policy issues, it can be said that the obstacles to the implementation of e-Government are dominated by policy or regulatory issues as (Awaludin, 2019) wherein an effort to implement the Electronic-Based Government System (SPBE), the superstructure is very supportive, the Organization has had regulations related to the Electronic-Based Government System (SPBE), such as Regional Medium-Term Development Plans, Service Strategic Plans, Regional Regulations or Mayor Regulations/Regent Regulations. However, the problem is regulations at the local government level. In this case, regulations issued by regional heads must be reviewed according to regional regulations and guidelines for Electronic-Based Government Systems (e-government). In addition, the provisions for the implementation of e-Government have not been widely understood by task

holders in each regional apparatus, and there are still many regional apparatuses that do not understand the role and position of service organizations (Awaludin, 2019).

Weaknesses in this policy aspect, in line with research findings (Huda & Yunas, 2016), that most importantly, it takes a strong commitment and leadership character in developing e-government. Without a strong and good leadership commitment, hopes, or aspirations to create a government system based on technology, information, and communication will be in vain or just a blueprint in a vacuum. Moreover, commitment and leadership characteristics are important to carry out transformations and changes in the administration of electronic-based government. In reality, the community and government officials find it difficult to implement new, more modern patterns.

The importance of the existence of a legal or regulatory umbrella cannot be separated from the condition of Indonesia, which is a state of law, so that in the implementation of e-Government, of course, it must not violate the applicable laws and regulations, in this case, the responsibility for developing e-Government is given to institutions that have legitimate and competent authority So the priorities and initiatives of the state in anticipating and utilizing advances in information technology must be further sharpened.

Regarding this policy issue, the author highlights most of the implementation of e-Government, namely the commitment of the political elite that is still lacking, especially in the local government environment, in this case, the lack of the role of regional heads in providing the best public services to the community through the implementation of government. Thus, e-government will not run effectively and efficiently even though there is sufficient budget and competent personnel in the ICT field. In addition, the services provided by the government website have not been supported by an effective management system and work process because the readiness of regulations, procedures, and human resource limitations hinders the penetration of e-Government into the government system.

3.3.2. Institutional

There are 24 articles related to the institutional dimension. The research potential on this institutional issue is very large because the issue is one of the main obstacles in implementing e-Government in Indonesia (Silalahi et al., 2015). The issues mentioned in this study include e-Government management agencies that do not have sufficient readiness (Jatmiko & Astuti, 2018). Adequate readiness in implementing e-Government is alleged because quite many blood governments do not yet have clear guidelines in the form of standard operating procedures (SOPs) when running e-Government (Erhan et al., 2017). What happens mostly is that local governments take the initiative to implement e-Government without clear direction (main tasks and functions) from the central government (Rosady, 2018).

In Thailand, the central agency plays an important role in the establishment and implementation of e-government. Thailand has progressed through various e-government policy frameworks since the 1990s. The current military government is implementing a digital transformation strategy, version 4.0, to improve business competitiveness, citizen welfare, and public sector performance (Sagarik et al., 2018).

Top management support, the existence of a good work organization, for example, at the local government working unit (SKPD) level as the executor of e-government-based service delivery, can support the success of e-government (Junaidi, 2015). Another supporting factor is a task force unit that helps implement e-government, for example, in the IT field (Puspa & Hariani, 2017). These work units must have an effective program and organizational structure (Widiyarta et al., 2020). The running of e-Government institutions cannot be separated from the support of financial resources (Batubara & Helmy, 2000), as well as reliable human resources even at the Neighborhood level, because it turns out that the role of the Chair of the Neighborhood

(RT) is quite important as a coordinator at the community level who can support e-Government success (Antoni et al., 2018).

Barriers to the implementation of e-Government include unclear authority and coordination between agencies (Bimasakti et al., 2017). This obstacle can be seen from regional devices that make applications without coordination (Awaludin, 2019). It was even found that there were factions at the institution, where there was a lack of synergy between one group and another. This could be read as an obstacle to coordination (Setyadi, 2019). In addition to obstacles in the coordination aspect in e-government institutions, the lack of adequate human resources is also an obstacle (Muliadi, 2015; N. O. I. Putri & Warsono, 2018). Some even have local governments that do not have institutions due to minimal budget support (Sulismadi et al., 2017).

In observing the obstacles, supporting and inhibiting factors found from some of these studies, it was identified that several things needed to be done by e-government implementers, including the need to form a competent work team (Mulyanto, 2020), authorized and responsible for the development and implementation of e-government (Triprastiwi & Niswah, 2020). Institutions in organizations and work units are formed optimal if there is no support from top management (Erhan et al., 2017). The importance of institutions that are supported by top management is expected to give birth to simple service procedures and good coordination between agencies (Susanti et al., 2019).

Practically it was found that the community has not widely felt the existence of e-government. Its users are relatively small when compared to the population. This condition is contributed by the quality and quantity of Human Resources who manage the implementation of e-government, in general, do not have sufficient competence. On the other hand, some problems are latent but rarely acknowledge, namely the fragmentation (grouping) tendency within the local government bureaucracy (Setyadi, 2019). Concerning this institution, it is equally important to highlight management support, common goals, and trust between organizations in a high-performing cross-border e-government system (Chen et al., 2019).

In several research articles, the researcher highlights the phenomenon of e-Government initially implemented with a project system and the absence of knowledge transformation to the authorized officers who served as operators. So, after the project is completed, the apparatus is less able to operate the program so that e-Government becomes less updated. Then due to the lack of awareness of several officers in the agencies, the officers who served as operators who update often carry out tasks that should not be their responsibility, in the sense that institutional coordination does not run-in sync. It is a concern how future studies can contribute solutions to this phenomenon.

3.3.3. Application

There are 13 articles related to the application dimension. Some of the issues discussed in these studies include e-Government constraints on the application dimension, dominated by optimal application performance. As it was found that there were inactive applications, the application was not optimal because it was only information and less integrated with services (V. N. F. Putri & Priyadi, 2018), as well as online services on website-based e-Government (Setyadi, 2019; Widiyarta et al., 2020). Another obstacle is related to less-than-optimal integration and interoperability, with incomplete and less detailed content (Bouty et al., 2019; Jatmiko & Astuti, 2018; Susanti et al., 2019).

Applications with optimal performance with detailed and complete and integrated content support the success of e-Government which has a good impact on society (Kusnadi & Ma'ruf, 2015). Although there are already available applications integrated with public services (Shobaruddin, 2018), it needs development oriented to ease of use (Rosady, 2018). An example of e-Government development efforts from the

application dimension is integrating data and application processes through Government Service Bus (GSB) technology (Handika et al., 2019).

In several articles that were collected, the researcher highlighted the constraints on e-Government development related to e-Government management, namely from the application dimension, namely application management patterns, forms of cooperation in application management, application reliability and security, many managers' resources, and socialization of e-Government development at the institutional level involving the public and the private sector. Further afield is standardized application interoperability. Thus, it is important to multiply studies on these issues to contribute and provide solutions to application problems in e-government implementation.

3.3.4. Infrastructure

There are 15 articles on several studies related to the infrastructure dimension. The issues mentioned in this dimension are dominated by network disruption constraints caused by a lack of infrastructure to support e-government. The existing infrastructure tends to be not optimal and still insufficient (Batubara & Helmy, 2000; Bimasakti et al., 2017; Esabella & Fitri, 2015; Junaidi, 2015; Ulfa, 2018). It was even found that there were local governments or e-Government implementing agencies that did not have the authority to maintain infrastructure (Sumarmin, 2019). The condition of infrastructure in Indonesia itself, as researched (Sabani et al., 2019), is said to be bad, so that it becomes an obstacle in the development of e-government in Indonesia.

In observing the constraints, supporters, and barriers of e-Government from the infrastructure dimension, several efforts need to be taken, including the need to evaluate the existing infrastructure so that the results of the evaluation give rise to considerations of the need for infrastructure improvements (Handoko, 2016; Susanti et al., 2019), improvements This is needed for future development (Rosady, 2018). Thus, the position of ICT infrastructure is very important in building ICT infrastructure that has cross-sectoral effects throughout the country because it will make the implementation flow run smoothly and efficiently (Choi et al., 2016).

In several studies collected, the researcher highlights the market penetration of hardware and information technology service providers that have not been evenly distributed to the regions. It is not only a problem in the superstructure but also inadequate infrastructure. This problem is also exacerbated by the high cost of ICT technology facilities and infrastructure. Technology is the basis for the achievement of successful e-government. Therefore, the government is obliged to provide adequate infrastructure and facilities to achieve the objectives of e-government implementation. Thus, studies on these issues need to be expanded to identify and provide solutions to infrastructure barriers. Studies on telecommunication infrastructure access, quality, scope, cost, and other factors are important to support improvements in the dimensions of e-government infrastructure.

3.3.5. Planning

There are 15 articles related to planning dimensions that were found. The issues mentioned in several studies include the lack of a strategic plan, making local governments lost in adopting the e-Government system (Erhan et al., 2017). The constraint of e-Government in the planning dimension is that there is no clearer and detailed planning such as a blueprint (Muliadi, 2015), whereas, in the implementation of e-Government, critical factors in public management participation include making strategic plans, budgeting, fostering citizen participation, and monitoring systems and evaluation (Shobaruddin, 2018).

The supporting factors of e-Government from the planning dimension are good information system management (Anugrah, 2020), application development plans (Puspa & Hariani, 2017), as well as the existence of a master plan or road map in the implementation of e-Government (Jatmiko & Astuti, 2018). Meanwhile, the inhibiting

factor for e-government in the planning dimension, namely the preparation of a master plan for the development of ICT in the planning process, is still running slowly (N. O. I. Putri & Warsono, 2018), this is related to readiness in planning which is hampered yet funding is open (Hanum, 2020).

In observing the obstacles, supporting and inhibiting factors, the efforts that need to be taken for the successful implementation of e-Government include adopting a public-private partnership pattern of cooperation (Triprastiwi & Niswah, 2020). This pattern of cooperation can be juxtaposed with integrated network infrastructure development planning (Apriani & Hani, 2016), human resource development planning through training and education and training (Batubara & Helmy, 2000). In addition, in the planning dimension, it is necessary to consider the realization of offline facilities to support e-Government-based services (Handoko, 2016).

The importance of planning aspects in implementing e-government considering that it can be said that Indonesia is currently still in the process of transitioning from a fundamental government system to a transparent democratic system of government. In this transition process, the government system can be reorganized to be more oriented to the people's interests. The potential for changes that occur should ideally be followed by free communication barriers between the government and the community and increased community participation so that the changes faced do not have a negative impact on both parties. Thus, the government should be more open and responsive to information and public aspirations.

The diffusion of information technology in community activities, both individuals and organizations, and the extent to which information technology is socialized to the public through the educational process are interesting things that the authors highlight. In planning, the government's resistance and society to changes resulting from socio-cultural conditions deserve attention. The government and citizens are not necessarily comfortable and understand the use of e-government. It is necessary to pay attention to socio-cultural aspects in planning because of the characteristics of the Indonesian state, which has a large socio-cultural diversity, so that programs and policies born from the planning process must be able to accommodate the wide variety of differences in Indonesian society. In addition, the political aspect can also affect the planning dimension, where the implementation of e-Government is ideally based on the public interest and for the welfare of the community, not the interests of certain political parties.

4. Conclusion

Discussions on issues related to the dimensions of policy, institutional, application, infrastructure, and planning can provide an overview of how e-government is implemented and what factors influence the implementation of e-government. Findings extracted from several articles may not represent the population or be generalized because the dominance of the case study research method cannot be used as a reference, considering the differences in characteristics and conditions in each area studied have differences from one another. However, the issues related to the PeGi dimension can provide an overview of the central problems in the implementation of e-government because the research variants collected consist of various research methods, and various types of e-Government relationships are expected to be an ideal central picture.

Research with the theme of e-Government in Indonesia in the last five years can be said to be lacking. Lack of academics and practitioners in reviewing e-Government can have an impact on inconsistency in e-government development. The potential for studies on e-Government and themes related to these fields has a large opportunity to be reproduced. However, to achieve this, it is necessary to support the government and the synergy of academics and practitioners to continue identifying the influential factors in the implementation of e-government. Bearing in mind, governance and social conditions of society are always dynamic.

The use of Indonesia's e-Government Ranking (PeGI) as dimensions in exploring the implementation of e-Government is a different perspective that can enrich research treasures, both as analytical variables and for grounded theory purposes, with various research methods, including literature review, both as initial studies of a field of knowledge, with the expansion of dimensions space and time. Furthermore, the expanded scope of research, both as an exploration and a comparison, can show the position of research findings hoping that it can contribute to actual issues of e-Government both theoretically and practically.

Acknowledgment

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