

The Obstacles of the E-Government Implementation: A Case of Riau Province, Indonesia

Achmad Nizar Hidayanto, Yulia Razila Ningsih, Puspa Indah Sandhyaduhita, and Putu Wuri Handayani
 Faculty of Computer Science, Universitas Indonesia, Depok, Indonesia
 Email: yulia.razila@gmail.com, { nizar, p.indahati, putu.wuri }@cs.ui.ac.id

Abstract—The implementation of e-Government on the government sector is a must as it gives huge benefits. Unfortunately, many organizations in developing country did not perceive benefits of e-Government as expected, as experienced by the government of Riau province, where in 2012 it was still in fair category. This research aims to study challenges and barriers of the e-Government implementation in the government of Riau province. We studied theories of previous research and formulated five main variables as the obstacles of the e-Government implementation in the Riau province. Results of Partial Least Square Structural Equation Modeling (PLS-SEM) concluded that leadership, human resources, information processing and organizational culture are factors that inhibit the implementation of e-Government in the Riau province.

Index Terms—e-Government, obstacle, barrier, leadership, human resources, organizational culture, information processing, Indonesia, partial least square, PLS

I. INTRODUCTION

In Indonesia, the use of information and communications technology (ICT) by the government has begun since the early of 2000. It is characterized by the Presidential Instruction No. 6/2001 dated 24 April 2001 on Telecommunications, Media and Information, which stated that government officials should use ICT to support good governance and accelerate the process of democracy. Two years later, the President of the Republic of Indonesia Megawati Sukarnoputri issued Presidential Instruction No. 3/2003 on policies and strategies for the development of e-Government. In Instruction No. 3/2003, the president mandated to every governor and regent/mayor to take concrete steps necessary in accordance with the duties, functions and their respective authorities to the implementation of the e-Government development nationally.

The Law No. 22/1999 were updated to become Law No. 32/2004 on local government, thus helped spur the development of e-Government at the local level. Orientation of the current local governance has shifted from dependence on the central government to the local governments' ability to build the region itself towards the

welfare of the society. Implementation of e-Government can basically provide opportunities for the development of a region. With existing facilities, the government can facilitate the service process, improve interaction with citizens and businesses, as well as facilitate the provision of information to the public.

Since 2007, the Indonesian Government through the Directorate of e-Government in the Directorate General of Applications and Information Technology, the Ministry of Communications and Information Technology has held a ranking of e-Government in Indonesia (PEGI) which involves agencies in the central government and local governments in all regions of Indonesia. PEGI activities are held in order to map the use of ICT by government agencies nationwide.

TABLE I. PEGI DATA FOR THE RIAU PROVINCE

Dimension	Year	
	2008	2011
Policy	2.29	2.17
Organization	2.4	2.33
Infrastructure	2.1	2.14
Application	2.48	2.23
Planning	2.25	1.93
Average	2.3	2.16
Category	Low	Low

Source: the Directorate of e-Government in the Directorate General of Applications and Information Technology, the Ministry of Communications and Information Technology, Republic of Indonesia

Table I exhibits the PEGI ranking of the Riau province. It shows that since the launching of e-Government in 2003, the status of the e-Government implementation in Riau province until 2012 is still in the low category. Based on these data, we can draw a conclusion that there are obstacles experienced by the Riau province government in the implementation of e-Government. Therefore, we reason it is necessary to identify the underlying factors that inhibit the implementation of e-Government in Riau province government.

II. CONCEPTUAL MODEL

According to its interaction, e-Government can be classified into three types, namely: Government to

Citizen (G2C), Government to Business (G2B) and Government to Government (G2G). According to Indrajit [1], the benefits of the e-Government implementation for the country, among others are:

- Improve the quality of government services to their stakeholders;
- Improve transparency, control, and accountability;
- Reduce significantly the total cost of administration, relationships, and interactions;
- Provide an opportunity for the government to obtain new sources of revenue;
- Creating an *environment* that can quickly and accurately answer various existing problems;
- Empowering communities and *other* parties as the government's partner in the process of public policy-making.

During its development, the implementation of e-Government does not always give expected outcome. It means that not all developments of e-Government can achieve its objectives and perceived benefits. Various theories and research results showed that the most important challenge is to realize that there is no single solution for all situations. Each situation requires a different approach for its implementation. In this study, we integrated several inhibiting factors that are presumed to be the potential barriers to the adoption and development of e-Government in Riau province government which are leadership, IT infrastructure, information management, human resources and organizational culture. The followings are the definition of each variable and its underlying theoretical foundation to formulate our hypotheses:

A. Leadership

Leadership is defined as a factor that is related to the priorities and initiatives in the country in anticipating and taking advantage of the technological advances. Schwester [2] showed that leader and budget allocation significantly affect the implementation of e-Government in New York USA. Azis [3] considered both factors as part of leadership factor. Lee [4] explained that the lack of plans and strategies as part of leadership factor is one of the factors contributing to the failure of the e-Government implementation in developing countries. Based on this explanation, we hypothesized as follows:

H1: Leadership will influence the implementation of e-Government.

B. IT Infrastructure

According to [5] in [6], the implementation of e-Government is expected to provide access to residents and other users as one stop service gate. Therefore, all government agencies are expected to share data in the implementation of e-Government. Currently, government agencies have their own hardware and software specifications, thus leading to difficulties during the integration process. Therefore, the use of information technology standards is absolutely necessary. [3], [7], [8] stated that lacking of IT infrastructure standards is a

factor that hinder the implementation of e-Government. Based on this, we hypothesize as follows:

H2: IT infrastructure will influence the implementation of e-Government.

C. Management of Information

Presidential Instruction No. 3/2003 explained that the management of information is one key to the success of e-Government. We believe that if the information management is not done properly, it will have impact on the implementation of e-Government. The information management is related to the quality and management of information, from its creation, processing, storing, and distribution. [6] stated that the information stored in the database and the system is invaluable. Therefore, building a solid trust environment by providing a high level of data privacy, data integrity and user authorization will ensure the security of electronic transactions and authentication of online identity [9]. Considering this, we outlined our hypothesis as follows:

H3: Information management will influence the implementation of e-Government.

D. Human Resources

Human Resources is an asset and serves as a non-material/non-financial capital in organizations, which can translate into physical and non-physical potential in realizing the existence of the organization. According to [10] in [6], e-Government officials should consider training and education as one of the most important factors that influence the successful implementation of e-Government. [11] stated that public officials, senior managers and politicians are often lack of understanding of IT capabilities and IT awareness. [12] also showed that developing countries usually faced difficulties in attracting skilled employees. Based on this, we formulate our hypothesis as follows:

H4: Human resources will influence the implementation of e-Government.

E. Organizational Culture

[6] identified organizational culture as group in the brain that distinguishes members of different organizations. According to [13], the implementation of e-Government may be affected by various issues of organizational culture. Therefore, the government should be ready for this change and adopt a new strategy for the implementation of e-Government [14]. In addition, [13] stated that the organization sees itself progressive and not lag behind other organizations related to the provision of services and e-Government infrastructure. The organizations compete for political, status recognition and resources. [6, 15] argued that the implementation of IS/IT will involve major changes in the organizational environment. In addition, implementation of IS/IT in public organizations can result in government employees resistance [16] as employees feel a loss of authority and control of traditional business processes. Based on this, we hypothesized as follows:

H5: Organizational culture will influence the implementation of e-Government.

Fig. 1 shows our research conceptual model.

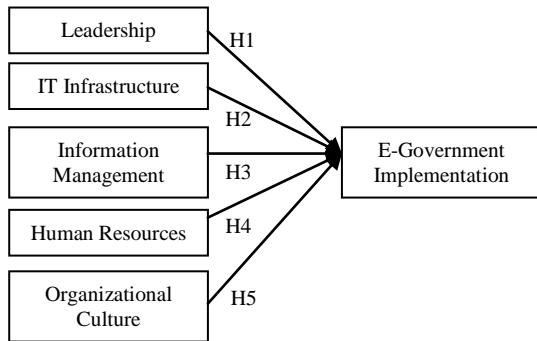


Figure 1. Research conceptual model

III. METHODOLOGY

This study was conducted to analyze the inhibiting factors of e-Government in the province of Riau. The target of the population was Riau province government employees.

Data were collected using a survey method with one shot data collection in which the sampling was drawn by using purposive/judgment sampling. The sample size was determined using the conventional approach. According Guritno et al. [17], structural equation modeling requires a sample size of between 100-200.

In this study, we used questionnaires as a measuring instrument to the variables in the research model. The questionnaires were sent to 19 government agencies in the Riau province. The instrument used in this study was constructed by combining several previous research instruments. The questions in the questionnaires were designed based on the measurement items for each construct or latent variable models that exist in the design of the study. Table II shows the variables and indicators used this study.

IV. RESULTS

A. Respondent Demographics

We sent 165 questionnaires and obtained 134 respondents returning the questionnaires and so our response rate is 81%. The majority of the respondents were male, i.e., 93 respondents (69%), while for female there were 41 respondents (31%). In terms of age, most respondents, 80 respondents or 60% are in the age of 25-35 years, 13 respondents (10%) are under 25 years, and 41 respondents (30%) are over 35 years. In terms of work experience, most of the respondents had been working in the IT sector for over 5 years as many as 52 respondents (39%), 3-5 years as many as 45 respondents (33%) and less than 3 years as many as 37 respondents (28%). In terms of education level, as many as 78 respondents (58%) were bachelor graduates, 24 respondents (18%) were master graduates, 20 respondents (15%) were diploma graduates, 9 respondents (7%) were high school graduates and 3 respondents (2%) were PhD graduates.

TABLE II. VARIABLES AND INDICATORS OF RESEARCH INSTRUMENT

Variable	Indicator
E-government Implementation	- Make the work more effective [1, 4], - Online services [4] - Ease of access to data and information [4]
	- Reducing the costs associated with a third party (the procurement of goods, auctions, communications, etc.) [1, 18] - Reduce administrative costs (paper, letter, pen, etc.) [1, 4, 18]
	- The accuracy of the data and information [4] - The website can be used as an effective communication medium [18]
	- Plans and long-term strategy [1, 4, 6, 8] - Budget allocation ; [1, 2, 3, 6, 8, 15] - A clear vision and mission [4] - Support from elected leaders [2, 6, 15]
Leadership	- Regulations in the implementation of e-government [1, 4, 6, 8] - E-government policies are always in review [4, 6]
	- Adequate infrastructure for the implementation of e-government [4, 6, 8, 15]
	- Adequate IT infrastructure for system integration [4, 6] - The use of standards in the development of IT infrastructure [4, 6, 8, 15]
IT Infrastructure	- Assurance of quality, timeliness and availability of data [2, 6, 8, 15, 19] - Systems supporting e-government implementation in accordance with the duties and functions of the agency [6, 19]
	- Procedures in the management of data and information [6, 19]
Information Management	- An adequate level of understanding [6, 8] - Education and training [6, 8, 18] - A reliable IT human resources [6, 15]
	- Human Resources
Human Resources	- Motivation to innovate [8] - The level of acceptance of risk [8, 20]
	- Support from management, encourage adoption of e-government [13] - Cultural sharing of information [3, 6, 18] - Resistance to change [3, 6, 8, 15]
	- Organizational Culture

B. Measurement and Structural Model Testing

We evaluated our research models in PLS-SEM using SmartPLS 2.0 M3 program. The measurement model was evaluated through confirmatory factor analysis (CFA) to test the validity and reliability of the latent constructs. We then proceed with the evaluation and testing of structural model to test the significance of relationship between constructs or latent variables.

Based on the results of measurement model testing, we eliminated 3 indicators (Leadership1, IT Infrastructure 2, and IT Infrastucture 3) which had loading factor values < 0.5. AVE and communality values of all constructs > 0.5 so that they meet the requirements of convergent validity. Likewise also the composite reliability values of all constructs > 0.6, therefore it can be concluded all constructs meet the reliability test.

PLS-SEM aims to examine the predictive relationship between variables to see if there is relationship between these variables, so that the consequences of the use of PLS-SEM is that the testing can be done without a strong theoretical basis, ignoring some assumptions (non-parametric) and the accuracy parameters of the prediction

model (endogenous variables) can be seen from the coefficient of determination (R -square/ R^2) [21]. Based on SmartPLS results, the value of R^2 for the E-Government Implementation variable is at 0.6393. This means that the influence of leadership, information management, human resources, and organizational culture variables to the implementation of e-Government variable is equal to 63.93% and the remaining 36.07% is influenced by other variables beyond our model.

Significance test was used to see the effect of the independent variables on the dependent variable in the model via t -test. In this study, we used an approach to estimate the model simultaneously. This method was done by entering all the independent variables, then evaluating independent variables that have a significant influence to the dependent variable [22]. Variable is said significant if the significance value $>$ t -table [21].

TABLE III. PATH COEFFICIENTS

	Original Sample (O)	T Statistics ((O/STERR))
Leadership \rightarrow E-Gov Implementation	0.327926	4.445271
IT Infrastructure \rightarrow E-Gov Implementation	0.006231	0.099595
Information Management \rightarrow E-Gov Implementation	0.216404	2.629199
Human Resources \rightarrow E-Gov Implementation	0.203904	2.358604
Organizational Culture \rightarrow E-Gov Implementation	0.181999	2.517276

Based on path coefficient values (Mean, STDEV, T-Values) in Table III, we found that factors such as leadership, information management, human resource and organizational culture have a significant impact on the implementation of e-Government in the Riau province government. However, the IT infrastructure variable does not have a significant effect on the implementation of e-Government in the Riau province government.

C. Discussions

From the Table III, we can see that leadership is the most dominant factor of the e-Government implementation failure in the Riau province, with estimator value at 0.327926. This result is consistent with the finding from [3] which stated that the leadership is a factor causing the failure of the e-Government implementation in most parts of Indonesia.

Information management ranks second in contributing to the failure of the e-Government implementation with an estimator value of 0.216404. Presidential Instruction No.3/2003 mentioned that information management is one key to successful implementation of e-Government in Indonesia. Thus, if the information is not managed properly, it can lead to the failure of the e-Government implementation.

Human resources and organizational culture are in the third and fourth place with the estimator value of 0.203904 and 0.181999 respectively. In terms of human resources, [12] stated that most of developing countries have difficulty in attracting skilled employees. Our result

is also consistent with the finding of [2], [7], [8] which stated that human factor is the obstacle in the implementation of e-Government.

The last factor that played a role in inhibiting the implementation of e-Government is the organizational culture. The government of Indonesia is actually quite easy to gain access to the technology. In addition, we also have many leaders who have a vision of the development of electronic services. Unfortunately, the use of e-Government is often collide with cultural factors of management and users. This result is consistent with the result of [8] in Iran case study. Work of [2], [3], [15] also found that the resistance to change is one of obstacles in adopting e-Government.

As explained previously, one of the key success factor of e-Government implementation is the IT infrastructure (Presidential Instruction No. 3/2003), which can be form of the existence of infrastructure and IT standards. However, the results in this study do not support the theory and previous research conducted by [2], [15] which showed that IT infrastructure was one of the e-Government implementation barriers. Our finding was consistent with the finding of [23] in [24] that 80% of the e-Government failures were due to the non-IT related factors and only 20% were actually caused by the IT related factors.

D. Implications

In order to have better e-Government implementation, the governments should show their commitment (vision and mission) which is approved by the competent authorities; improve the skill of their human resources; create system documentations, standard operating procedures, or guidelines for managing electronic information, and develop organizational culture during e-Government implementation.

This study is also expected to further identify the inhibiting factors of e-Government implementation in developing countries. Our government should consider these factors to ensure the success of the e-Government implementation.

V. CONCLUSIONS

Our research results produces some important conclusions as consideration in the implementation of e-Government, particularly in the Riau province government. Leadership, human resources, information management, and cultural organizations were considered as inhibiting factors of e-Government implementation in Riau province government, where the leadership factor contributing most to the obstacles of e-Government in Riau province government. Thus, it is important for the governments in the developing countries to show their commitment and support for the success of the e-Government implementation. This study also concluded that the availability of IT infrastructure does not significantly inhibit the e-Government implementation in the Riau province government.

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Achmad Nizar Hidayanto is Head of Information Systems/Information Technology Department, Faculty of Computer Science, Universitas Indonesia. He obtained his PhD in Computer Science from Universitas Indonesia. His research interests are related to information systems/information technology, e-learning, information systems security, change management, distributed systems and information retrieval.

Yulia Razila Ningsih is a government officer. She recently obtained her master degree in Information Technology from Faculty of Computer Science, Universitas Indonesia. Her research interests are in e-Government and IT Governance.

Puspa Indahati Sandhyaduhita is a lecturer at the Faculty of Computer Science, Universitas Indonesia. She received her master degree from TU Delft, the Netherlands. Her research interests include business process modeling, enterprise engineering, supply chain management, business intelligence, requirements engineering and information systems.

Putu Wuri Handayani is a lecturer in Faculty of Computer Science, Universitas Indonesia. She obtained her master degree from University of Applied Science Fulda, Germany. Her research interests are related to information system/information technology such as e-commerce, enterprise resource planning, supply chain management, and customer relationship management.