Study on E-Government Integration: A Theoretical and Empirical Review

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Abstract. The term e-government integration is important to realize an organization's goal. The bureaucracy and procedures at government organization consume lots of effort, time, money, and sometimes holds back the success of the e-government integration goal. E-government Integration development is very complex with many stakeholders, users, and different procedures at each organization. Evaluation is needed to keep accelerating e-government integration. This paper-based on a systematic literature review and in-depth interview in local government structure on how to evaluate projects such as e-government integration on theoretical and empirical perspectives. This study contributes to a basis for building an appropriate implementation strategy for the e-Government maturity process. The result shows the methods and lesson learns for designing and evaluating the project of e-government implementation.

Keywords: E-Government, Integration, implementation strategy, Empirical Review.

1. Introduction

E-government integration is a governed information technology and communication (ICT) from various organizations that provide services for users available electronically or online services[1], [2]–[4]. The objective of implementing electronic government services is to provide services to all stakeholders in citizens with one data access point to obtain the services needed. This achievement will not be attained without integrating all the services in an application that is accessible to the government services to government organizations (G2G), government to citizens (G2C), government to businesses (G2B), and government to employees (G2E). E-government integration is an opportunity for the Indonesian government to improve services to be more efficient and effective. As we know, the Indonesian government has many organizations with different procedures and bureaucracy. Each organization develops its software application, database, and its own data centre to help their business need, so that resulting in disharmony between the various e-government service units itself is not optimal. Furthermore, the regulation has been begun out since fifteen years ago based on the President Instruction no.3/ in 2003 about national policy and strategy of e-government development, and the
Indonesian government has implemented e-government to accelerate services like e-billing, e-procurement, e-audit, e-catalogue, e-payment, e-controlling, and e-health.

2. Methodology
The mixed-methods approach used in this research is theoretical and empirical analysis. Systematic literature review (SLR’s) techniques used for theoretical reviews and in-depth interviews in a few local government cases with government structure interviews in the IT field conducted for empirical reviews. Figure 1 illustrates the methodological phase used in this study.

Figure 1. Mixed methods approach to E-Government Integration.

Phase 1, theoretical review uses a systematic literature review (SLR) method for review. A systematic review is defined as a process of identifying, assessing, and interpreting all available studies investigation with the purpose to provide answers for specific research questions. In this method, the search is executed in papers found in the online databases from different scientific databases like Scopus, IEEE Xplore, ACM Digital Library and Science Direct. The most important activity for SLR is to formulate the research question[5]. The research questions addressed by this systematic literature review are shown in Table I. Phase 2 defines the terms e-Government and integrated government based on theoretical perspectives which will be used further to make instrument interviews dan data extractions. Phase 3, conducting deep interviews with several local government services, to get some lessons learned for empirical data. Phase 4 analyses the data with content analysis and then evaluates and recommends improvements for future work.

Table 1. Research Question Design

| ID  | Research Question                                           |
|-----|------------------------------------------------------------|
| RQ1 | What is the definition of e-government integration and evaluation? |
| RQ2 | What kind of methods are used for e-government integration evaluation? |
| RQ3 | What is the empirical lesson learn in the context of local government? |
The search query that used for scientific databases using Scopus index are:

1. TITLE-ABS-KEY (e-government AND integration) AND PUBYEAR > 2019), using this query 400 literatures were gathered.
2. TITLE-ABS-KEY (evaluation AND e-government AND integration OR collaboration), using this query 131 literatures were gathered, and after adding limitation on year of publishing > 2019, 49 literatures were founded.

Meanwhile from using IEEE Xplore Digital Library, 27 literatures were founded, and with the same key word on Science direct, 173 literatures were founded. The criteria were used for selecting final paper. These criteria are shown in Table 2.

| Criteria | ID | Discussion |
|----------|----|------------|
| Inclusion Criteria | RQ1 | What is the definition of e-government integration and evaluation? |
| Exclusion Criteria | RQ2 | What kind of methods are used for e-government integration and evaluation? |

3. Result and Discussion

3.1. RQ1 What is the definition of e-government integration and evaluation?

After the literature review, we found the definition of e-government integration and evaluation. The result of the finding is in Table 3.

| Key Terms | Definitions | References |
|-----------|-------------|------------|
| E-Government | Electronic government is the use of ICT, particularly the Internet, as a tool to achieve better government. Electronic government is about the delivery of government information and services online through the Internet or other digital means. Electronic government is the public sector’s use of ICT to improve data and information service delivery, encouraging citizen engagement in the decision-making process, and making government more trust, transparent, and useful. | [1], [2]–[4] |
| E-government Integration | The term ‘integration’ means ‘combining parts so that they work together or form a whole’. So, the term ‘integration’ would have many definitions according to the field that deals with it (sociology, economy, biology, mathematics, electronics, engineering, and others). In a broad sense, integration is a popular term meaning greater efficiency, effectiveness, and competitiveness in organizations. The word “integration” can also apply to e-government literature in order to define service integration. Another reference defines service integration as the most sophisticated level of e-government in which government services integrated. The required services are accessible from citizens and businesses irrespective of the organization or department offering them. As a result, a single portal entry service established. Integration is not about creating one big technical system. The ultimate data integration system allows loose coupling among heterogeneous data sources and access management while maintaining an exchange of data. An organizational arrangement whereby multiple organizational units collaborate in the concentration of providing accurate and timely services in a single access point to all users. This arrangement needs unified efforts from all stakeholders to overcome all obstacles faced on the way. | [7], [8], [2], [7], [9], [10], [11] |
E-government Evaluation

Evaluation analyses the level of achievement of both expected and unexpected results by examining the results chain, processes, contextual factors, and causality using appropriate criteria such as relevance, effectiveness, efficiency, impact, and sustainability

3.2. RQ2 What kind of methods are used for e-government integration evaluation?

E-government evaluation, reference considered Balance Score Card [13] as an interdisciplinary set of performance assess that not only include both financial and non-financial measures but are related to four main aspects or dimensions that are linked together such assessment from a financial aspect, the customer aspect, business process, and innovation and learning aspect. This study attempts to summarize some of the popular methods used from several literature reviews, as shown in Figure 2.

![Figure 2. Methods are used for e-government integration evaluation](image)

The study using TOGAF (The Open Group Architecture Framework) as an improvement of Performance at Evaluation of Local Government Implementation (EKPPD) system development on General Government Office to optimize ICT services by integrating all ICT elements comprehensively with Service Simple Approach as a comprehensive framework[16]. Another study used Belief Rule-Based Expert System (BRBES) to evaluate e-government in a country. E-government implementation evaluation, determinants, characteristics, and results can be considered as examples of following attributes, while factors under each category can be considered as the antecedent entities[15]. In evaluation, the causal relationship between each aspect and its corresponding variables and factors may be non-linear and complex, and different types of uncertainties are associated with each factor, therefore, Believe Rule Base (BRB) can be considered to be an appropriate knowledge schema to build the knowledge base of the smart system. This technique would allow the evaluators to perceive how the results are produced and to identify the contributing role of each variable in the overall evaluation of the services in a system integrated. According to[14], to develop a new evaluation framework that assesses user satisfaction with e-government services integration, the proposed Key Performance Indicator (KPI) in the literature to understand how they affect user satisfaction. Based on
this observation, the observed performance indicators are grouped into four sets of dimensions: cost, benefit, risk, and opportunity. The cost and benefits factors are mostly tangible and are often easy to measure, whereas risk and opportunities are mostly intangible. The expected directions of the hypothesized causal–effect relationships among the four dimensions of the new framework called COBRA: Costs, Opportunities, Benefits, Risks Analysis are presented in[14]. COBIT 5 method [17], [18] used to evaluate and monitor the implementation of governance in local government. At the operational level, middle and lower management running the domains of COBIT 5 is very applicable and guided for e-government integration.

The Government of Indonesia uses an electronic-based government system or called Sistem Pemerintahan Berbasis Elektronik (SPBE)[19], which uses the maturity index of e-government implementation at all levels of government both central and regional. In Research Question 3 (RQ3), the discussion on empirically implementing SPBE will discuss.

3.3. RQ3 What is the empirical lesson learn in the context of local government?
Implementation of an integrated e-Government system in local governments in Indonesia has begun since the issuance of presidential decree no. 95 of 2018[19]. The Government regulations regarding the policy of implementing e-government since the previous fifteen years ago since Presidential Instruction No. 3/2003 concerning National Policies and Strategies for E-Government Development. Furthermore, the implementation of an integrated e-Government system constrained in the field. While the most recent portrait was carried out by the SPBE to local governments in Indonesia, as shown in Figure 3.

![Figure 3. SPBE maturity index for e-Government implementation in Indonesia][20]

Figure 3 illustrates that most of the local government areas in Indonesia are still not integrated (enough and minus categories), which are marked with orange and red zones. While blue and green colours indicate the implementation of SPBE, which is already good and very good. The SPBE Index data was accessed in June 2019 on the Ministry of Administrative and Bureaucratic Reform website, but it is now inaccessible in public because of requests from several local governments and some considerations Ministry.

The lessons learned from in-depth interviews conducted by several local governments and some of their empirical experience in the field found weaknesses in fundamental factors and readiness to run an integrated government. Fundamental factors such as ICT and non-ICT infrastructure (such as adequate internet network, bandwidth speed, data centre building, and human resource readiness), financial and regulation readiness factors for SPBE/e-Government submission are still constrained in most of the implementation of this policies. However, all the general local government is very
enthusiastic and eager to implement this e-government integration implementation system. This requires a process and education and enough literacy factors among the bureaucracy of policymakers in the local government itself.

The integrated government review itself has started well in several urban regional governments in Java, for example, government smart applications for smart city feature services such as Jogja Smart Services (JSC) by the Yogyakarta government, Jakarta Smart City in the Jakarta city government, Smart villages in the Bayuwangi local government, Smart City Surabaya has also implemented e-Government, Smart Services Application in Bandung and others. In fact, it is only necessary to strengthen the collaborative strategy of the parties related to infrastructure as well as to determine the success of implementing this program. For more details on the empirical lessons learned in the implementation of e-government in Indonesia, is a special research thesis title, here we can abduct a little research to show the continuing sustainability of the next research study and discussion.

4. Conclusion and Future research
This study presents a systematic review about the e-government integration evaluation which integrates different participant roles on different stages based on the organizational structure, political architecture, citizen culture, and business need. And the reason evaluations are needed because we need to know and understand how it will affect: user satisfaction, cost, benefit, risk and opportunity from e-government integration and also to overcome all barriers faced on the way. The lesson learns we can get in a theoretical and empirical study is how to make better implementation strategies to the e-Government maturity process. The future work of this study how to analyze better implementation strategies to realize an organization’s goal and make the government good services.

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