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**Author** : Eko K Budiardjo, Gerry Firmansyah, Zainal A Hasibuan  
**Paper ID** : 908  
**Subject** : Invitation Letter to Participate in 1st International Conference on Computing and Applied Informatics 2016

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We have made a decision regarding your submission to International Conference on Computing and Applied Informatics 2016, entitled "**Weighted Components of i-Government Enterprise Architecture**"

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# Weighted Components of i-Government Enterprise Architecture

**E K Budiardjo<sup>1</sup>, G Firmansyah<sup>2</sup>, Z A Hasibuan<sup>3</sup>**

<sup>1,3</sup> Faculty of Computer Science, Universitas Indonesia, Depok 16424

<sup>2</sup> Faculty of Computer Science, Universitas Esa Unggul, Jakarta 11510

Email: eko@cs.ui.ac.id, gerry.firmansyah@gmail.com, zhasibua@cs.ui.ac.id

**Abstract.** Lack of government performance, among others due to the lack of coordination and communication among government agencies. Whilst, Enterprise Architecture (EA) in the government can be use as a strategic planning tool to improve productivity, efficiency, and effectivity. However, the existence components of Government Enterprise Architecture (GEA) do not show level of importance, that cause difficulty in implementing good e-government for good governance. This study is to explore the weight of GEA components using Principal Component Analysis (PCA) in order to discovered an inherent structure of e-government. The results show that IT governance component of GEA play a major role in the GEA. The rest of components that consist of e-government system, e-government regulation, e-government management, and application key operational, contributed more or less the same. Beside that GEA from other countries analyzes using comparative base on comon enterprise architecture component. These weighted components use to construct i-Government enterprise architecture. and show the relative importance of component in order to established priorities in developing e-government.

Keywords : e-government, e-government component, principal component analysis, Government Enterprise Architecture

## 1. Introduction

According to Haiyan Qian, Director of the Division of Administration and management development, the United Nations Department of Economic and social affairs (UNDESA) states that the Enterprise Architecture (EA) is a strategic planning tool that is effective for the government to facilitate contacts and improve interoperability among government agencies, improve processes internal operations and improve service delivery to the community or residents [1]. EA in the government or the Government EA (GEA) is an important factor for the success of all types, scale and intensity of the e-government program. The main purpose of the GEA to make e-government into citizen-oriented, results-oriented. GEA development usually pass through different stages of evolution. MIT's research center information system identifies four stages of evolution or in GEA: business silos, standardized technology, rationalized the data and applications and business modularity.

According to Anthopoulos [2], the impact of the GEA is not utilized for the development of e-government in Greece, influence the procurement process errors causing financial loss and time. According to Jassen [3] at GEA research in Denmark and the Netherlands noted that the GEA can provide guidance in the development of e-government. GEA implementation will reduce costs as well as the development of e-government can ensure its development as needed.

## 2. Background

Indonesia has a e-government ranking (PEGI), which measures the use of ICT of each ministry and agency in order to obtain a map of the condition of the use of ICT in the national scope. These surveys are regularly conducted since 2007 until now. The survey examined five dimensions of policy, institutional, infrastructure, applications and planning [4]. In the survey allow each dimension has the same weight. With such patterns can be made possible a government agency will get the same rank value with other government agencies even though the amount of the value of different dimensions, though each dimension has a different purpose.

According to Firmansyah [5] in Indonesian studies of e-government component using data PEGI in 2011, found that there are five main components must be considered that the implementation of e-government in Indonesia can be successful. Found those components are: IT governance, e-government system, e-government regulation, e-government management and application key operational. By looking at the results of principal component analysis component of scoring formula it can be seen the weight or priority of each of the components that form each are as follows: IT Governance is 20.026, e-government system is 2.145, e-government regulation is 1.744, e-government management is 1.298, application key operational is 1.189. Each component of such research have different weights, resulting in the implementation of e-government should prioritize the largest weighting in advance so that the chance of success easier.

## 3. Methodology

This research starts from a quantitative study of the data PEGI in 2011 to seek the inherent structure by using principal component analysis (PCA) which produce the main components of Indonesia e-government. The main component is verified using qualitative methods such as interviews with a number of experts in the field of e-government. The next stage is to identify the components forming qualitatively government enterprise architecture that forms the government generic enterprise architecture. The results of the second stage was the basis for the establishment of enterprise architecture models for the Indonesian government (i-GEA). The stages of this research can be seen in Figure 1.

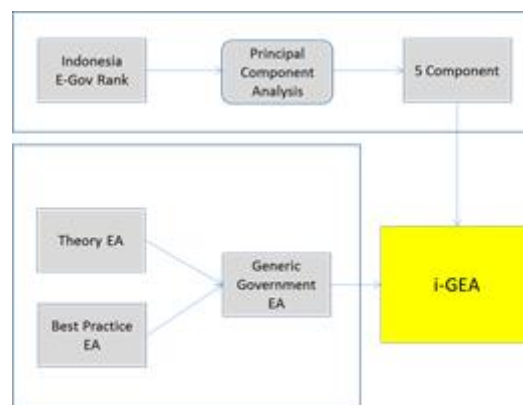


Figure 1 : Methodology to create i-GEA

The basic components from enterprise architecture base on theoretical refers to the components of Enterprise architecture Zachman, TOGAF, FEAF, Gartner, as well as parts of other countries who are already using the GEA. Components base on theoretical enterprise architecture consists of : business architecture, application architecture, data architecture, and technical architecture.

Comparison components enterprise architecture in various ways including : comparing based view / perspective, abstraction, SDLC phases [6], or compare by description, component, architectural view, based on the EA layers.

To compare GEA, some use the comparative approach based policies, actors and structures, governance, architecture frameworks and methodologies, principles and standards architecture, implementations [3]. Each method of comparison is made according to the needs. This research will use EA comparison method by comparing the layer-forming of any enterprise architecture theoretical and best practice. After comparison method it will get the component fundamental building blocks of the GEA.

Developing enterprise architecture using Toaster models. Each top layer supported by the layer below, as well as the outermost layer is supported by the deeper layers, and components depicted vertically supports the components depicted horizontally [7].

**4. Results**

According to study generic government enterprise architecture (generic GEA), a generic GEA can be built from research on theories EA and the Best practice EA. Theory research examines EA Zachman Framework, TOGAF, FEAF, this research see forming components of the EA as shown in table 1. While EA's Best Practice research, examining the implementation of the EA in the countries with the highest e-government index, Abu Dhabi [8], Australia [9], Canada [10], United Kingdom [11], South Korea [12], Singapore [13] and Egypt [14] as shown in table 2.

Table 1 : Component EA base on theories

Framework	Zachman	FEAF	TOGAF
What	Inventory sets (What)	Data Architecture (entities=what)	Data Architecture
How	Process Flows (How)	Application Architecture (activities=how)	Application Architecture
Where	Distribution Networks (Where)	Technology Architecture (Location=where)	Technical Architecture
Who	Responsibility Assignments (Who)	Resources Optimization	IT resources guidance
When	Timing Cycles (When)		
Why	Motivations Intentions (Why)	Business Architecture	Business Architecture

Table 2 : Component EA base on GEA others country

Framework	Abudhabi	Australia	Canada	UK	Korea Selatan	Singapura	Mesir
What	Data	Data Architecture	Information Management Architecture	Business Information	Data	Information Architecture	Data
How	Application, Security	Application Architecture	Application Architecture, Security Architecture	Business Process	Application	Application Architecture	Function
Where	Integration, Infrastructure	Technology Architecture	Network Architecture, Platform Architecture	Infrastructure, Security, Integration	Infrastructure	Technical Architecture	Network
Who	Operation		Service	Service Management			People
When	Access & Presentation		Presentation Architecture	Channel			Time
Why	Business	Business Architecture	System Management Architecture	Strategy	Business	Business Architecture	Motivation

Based on the results of the study on the components of enterprise architecture, the study of the theory enterprise architecture and government enterprise architecture other countries, the components of an enterprise architecture consists of : responsibility assignment (who), timing cycle (when), business architecture (why), application architecture (how), data architecture (what), infrastructure architecture (where). Proposed form of GEA generic as shown ini figure 2 based on the basic components of an enterprise architecture. From figure 2 described as follows: a group of orange as Responsibility Assignment, red group timing Cycle, a group of purple as business architecture, the deep blue color as Application Architecture, light blue as the data architecture, light blue color as infrastructure architecture, then the color gray as the implementation methodology GEA and black is a stakeholder of the GEA. The preparation of this component refers to the toaster model, where the lower level would support the level above.

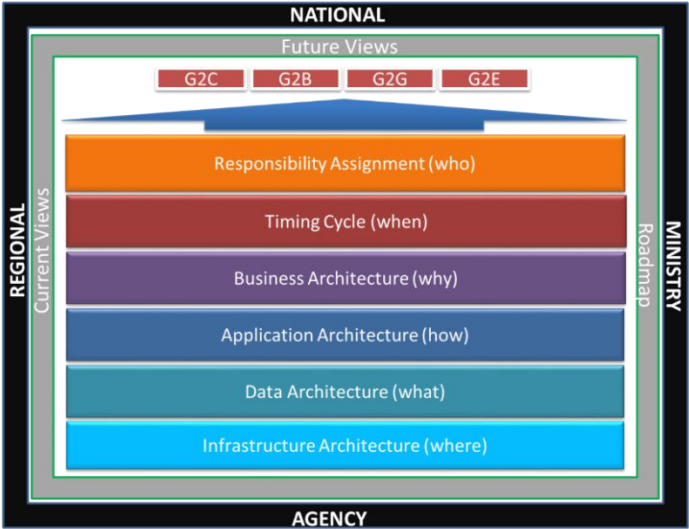


Figure 2 Generic government enterprise architecture

From the results of the PCA, the Indonesian government enterprise architecture enhanced by observing components: IT governance, e-government system, e-government regulation, e-government management, application key operational. To build the GEA with mapping architectural view, generic parts and components PCA results. After mapping component enterprise architecture the GEA be redesigned as show in figure 3.

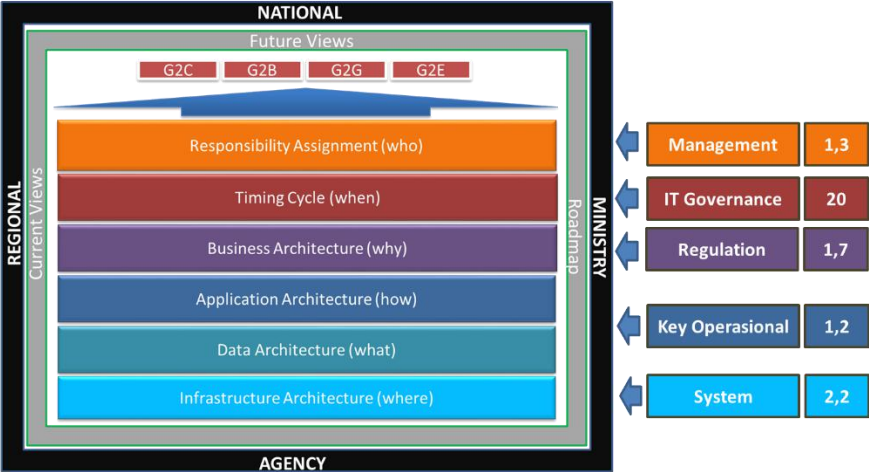


Figure 3 Weight component of i-GEA



## 5. Conclusion & Future Works

After doing all the research phase which started from the study of literature, the study of best practice EA users in developed countries, the study of e-government ranking outside and within the country, making government EA for Indonesia, performing PCA to the ranking of e-government in Indonesia, setting out the components of e-government as a shaper of EA in Indonesia government, then the researchers made the following conclusions:

1. Enterprise architecture components are theoretically as well as best practice consists of : business architecture, application architecture, data architecture, information architecture.
2. Form government enterprise architecture from a country need to incorporate components of local strong, to acquire inherent structure by PCA.
3. Inherent structure e-government Indonesia consists : IT governance, e-government systems, e-government regulation, e-government management, application key operations.
4. Give the weight / priority of a government enterprise architecture can help focus the implementation of the GEA itself.

The next research is necessary to process the data factor analysis of the e-government ranking of Indonesia as a whole from all the years of the implementation of the research, so we get a strong main components. I-GEA models need to be equipped with an action plan so that the Indonesia Government Enterprise Architecture Framework can be implemented.

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