

# AE Function

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# Enterprise Architecture Functions for Organization: A Perspective of Indonesia's Village Laws

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*Abstract*— Enterprise Architecture (EA) is often used by organizations as a tool to support the achievement of organizational goals. The most common issue why organizations used EA has at least 2 reasons, the first is due to complexity, and the second is change. Complexity relates to the function of EA to integrate information technology with the achievement of business organization goals. While the changes related to how EA adapt to changes that occur in the business environment. From literature search, EA not only has 2 functions, namely complexity and change. Some literature calls EA function were IT utilization efficiency, IT utilization effectiveness, align IT with business objectives, integration and some other functions that support the achievement of organizational goals. This paper discusses the Systematic Literature Review related to the functions of EA and how its perspective for the implementation of village laws in Indonesia.

*Keywords* – Function of Enterprise Architecture, Enterprise Architecture, Reduce Complexity, Anticipate Change, Alignment, Village Law.

## I. INTRODUCTION

EA is known as a model to describe the utilization of information technology in achieving organizational goals [1]. The four EA frameworks that organizations often use are Zachman, TOGAF, FEA, and Gartner. Each framework has both, the disadvantages and advantages to solve organizational problems, including issues of complexity and change.

Interviews conducted Seisson to Zachman provide a foundation of understanding of the EA. Zachman stated at the time of the interview [2]:

1. Architecture is an enterprise issue, not a system issue. The end object is the engineer or manufacturing, not simply to build and run the system.
2. EA is not some arcane, arbitrary concept. The architecture precedent of much older disciplines of architecture/construction and engineering/manufacturing.

According to Zachman EA is a set of descriptive representation relevant to describing Enterprise and the

baseline for change [2]. Initially EA was used as an instrument for complexity problems, changes, and adjustments.

The village laws is a legal instrument issued by the government to oversee rural development in Indonesia. The objectives to be achieved through the village laws are[3]:

- Forming a professional, efficient and effective, open, and accountable the village government.
- Improve public services for the village communities.
- Improve socio-cultural resilience of the village communities.
- promote the economy of the village community.

Referring to Zachman's statement that EA is an engineering discipline, EA's function is a matter of engineering process. The EA functions can be used as an alternative solution to engineer the purpose of the village laws. Associated with information technology that became one of the pillars of EA then the implementation for technology solution of the village laws is Decision Support System (DSS).

## II. METHODOLOGY

From the above introductions a research question is asked: 'How does the village law perspective on EA functions for the organization?' There are three steps to answer how the village laws perspective on EA functions for the organization. The first step is to do a literature review on EA functions for the organization. According to [4] a systematic literature review is often the first and essential step in the research process. The review process is systematically divided into three parts: Planning the Review, Conducting the Review, Reporting the Review[5]. Each part has its own stages. In this literature study not all stages were selected for simplification reasons, without reducing the substance of the results. Stages of review literature selected are: (1) identification of the need for a review, (2) search strategy, (3) documenting search, and (4) data extraction.

The second step is to collect operational statements contained in the village law document. A collection of operational statements was conducted to obtain the objectives and targets of village laws.

The third step is to determine the perspectives of village laws on EA functions. The objectives and targets of the second step determine the operational steps. The operational steps of the village laws can be supported by EA that have functions as defined in the literature review process. Figure 1, explains how the research stages are done.

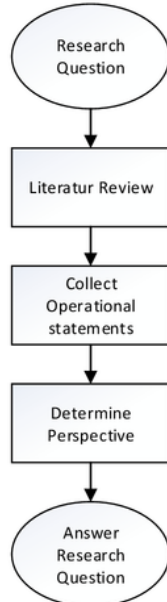


Figure 1. Research Steps.

### III. SYSTEMATIC LITERATUR REVIEW

#### A. Identification of the need of review and research question

This literature review aims to discover the tendency of EA function for the organization. EA is a model used to describe the use of information technology for organization. EA initially serves to reduce the complexity of information technology utilized by the organization and anticipate changes that occur in the organization. EA has expanded its functionality to organization. This scope literature review was to described the tendency of EA functions for the organization.

#### B. Search strategy

The literature search is the activity of selecting the literature database and entering the keywords according to the research question. The selected literature database were:

- Scencedirect ([www.sciencedirect.com](http://www.sciencedirect.com)),
- Proquest (<http://www.proquest.com>),
- Google Scholar (<http://scholar.google.com>),
- Emerald Insight (<http://www.emeraldinsight.com>),
- IEEE Xplore (<http://ieeexplore.ieee.org>)

The search facility used in the literature database was "advance search". The keywords entered into the advanced search facility were "enterprise architecture" AND "function" OR "impact" AND "organization".

The keywords entered into the advanced search facility are "enterprise architecture" AND "function" OR "impact" AND "organization". To get the appropriate literature then added search criteria:

- Word searching of "enterprise architecture" should be in keyword of studies found.
- Word searching of "function" OR "impact" should be in abstract of studies found.
- Word searching of "organization" should be in abstract of studies found.
- Searching of publication year between 2012 – 2015.

The studies obtained was filtrated through the research question. The steps taken for the filtering of the studies were: (1) Choose both Title and keywords of studies that have the word "enterprise architecture", which has no removed, (2) Choose abstract of studies that has the word "function" OR "impact", which has no removed, (3) Read the entire studies contents selected at point (2).

Stages of filtering the studies are shown in the following figure 2:

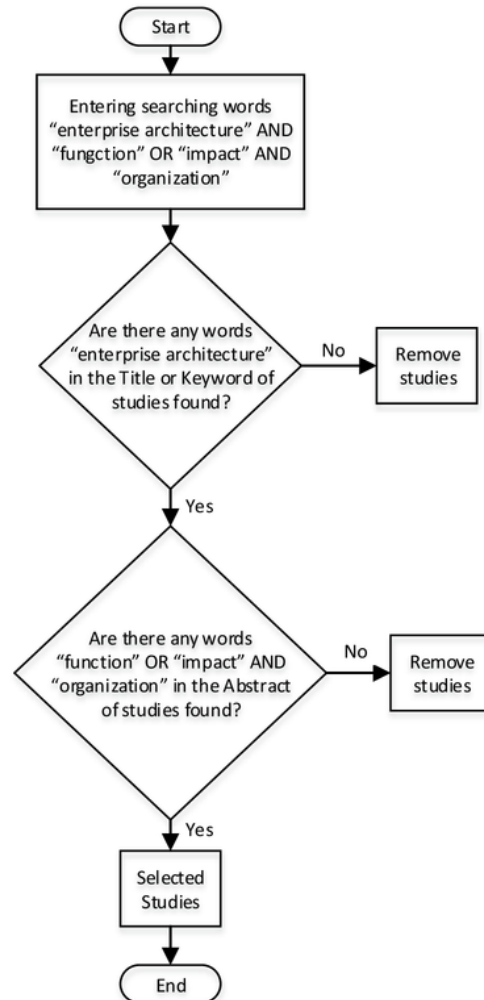


Figure 2. Filtering process

#### C. Documenting search

Literature search results were limited for papers in 2012 - 2017. From the list of papers obtained then filtered (title and keyword accordingly), selected as many as 303 papers. Of the

303 selected papers then filtered (the abstract was appropriate) and obtained 96 papers. Of the 96 selected papers then filtered (the introduction accordingly) and obtained 20 papers. More details are shown in table 1 below.

Table 1, Selected paper details

Literature Database	Studies		
	Studies Found	Candidate Studies	Selected Studies
Scimedirect	58	12	6
Proquest	66	27	4
Google Scholar	56	24	4
Emerald Insight	36	11	3
IEEE Xplore	87	22	3
Total	303	96	20

#### D. Demography Analysis

Demographic analysis is conducted on 20 selected papers. Of the 20 selected papers, there are 12 journals and 8 proceedings. Most of the paper are obtained from Elsevier publisher, the journal as much as 3 papers [6][7][8] and proceeding as much as 2 papers [9][10]. While the most proceeding published by IEEE, which is as much as 3 papers [9][10][11]. In total there are 11 journals and 9 proceedings.

There are 66 authors from 19 countries. The most prolific author is Nur Azaliah A. Bakar from Universiti Kuala Lumpur, Malaysia, as many as 2 papers. The author most come from the State of Colombia and Netherland each of 6 authors[10][12]. There are 4 papers involving authors from several different countries. The country's collaborations are: (1) Switzerland, South Africa, Austria [7], (2) USA, UK [8], (3) USA, Germany [13], (4) Namibia, South Africa [14]. The most publish country is Finland as many as 2 papers.

The organization that uses the most EA is the government as much as 5 papers [6][15][9][16][17]. The next utilization of EA functions are health organization and financial organization (banking), each 2 papers. While the use of EA by automotive organizations, cement, small medium enterprise, IT consultant, retail, education, each of 1 paper [17][18][19][10]. Figure 2 shows the quantity of organizations using the EA framework.

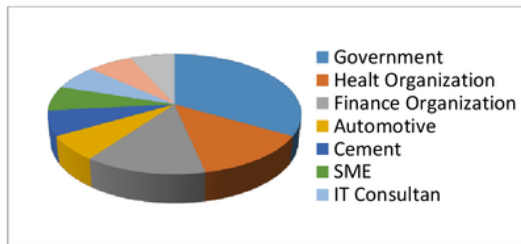


Figure 2. Quantity of organization using EA framework

The functions of EA that raised in government organizations are reducing complexity, alignment, and change. From 5 papers on government organizations, 4 papers raised the issue of reduce complexity [6][16][9][17], 2 papers raised alignment issues [6][15], and 2 papers raised the issue of change [6][17]. Figure 3 shows the three major EA function in

government. There are 2 papers discussing alignment issues for health organizations [20][21] and factory industries[22][14]. The fact is quite interesting, there are 4 papers that discuss the issue of change for non organizations [7][23][13][12].

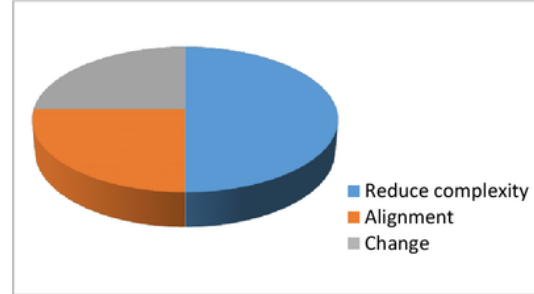


Figure 3. The functions of EA in government.

Of the 20 selected papers, there are 9 EA frameworks referenced : Zachman, TOGAF, FEAF, Gartner, DODAF, TEAF, E2A, EAP, MODAF. The most commonly used EA framework for reference is the Zachman framework [6][7][8][23][13][9][10][20][24] and TOGAF framework as much as 9 papers [6][7][8][13][9][16][19][20][24].

Twenty selected papers have fourteen EA functions found. Table 2 below presents a quantitative tabulation of EA functions referenced by of twenty selected papers.

Table 2. Paper referenced for the EA function

No.	EA function	Number of referred papers
1	Reduce complexity	8
2	Anticipate change	7
3	Aligning	9
4	Comprehensive	1
5	Ensuring IS	1
6	Harmonizing	1
7	Improve communication	1
8	Integrating	4
9	Interoperability	1
10	optimizing Investment	1
11	Systematic	1
12	Rigidity	1
13	Viability	1
14	Standardization	1

#### IV. Indonesia's VILLAGE LAWS

Nawacita Program of president Joko Widodo is a program that was carried out at the time of Joko Widodo and Jusuf Kalla advanced as a presidential candidate and vice presidential candidate of Indonesia in 2014. After Joko Widodo was elected president, the program of Nawacita became a reference for Indonesia's development. The third



agenda of the nawacita program is 'Building Indonesia from the periphery by strengthening the regions and villages' [25].

The legal basis of regional and village development is the Indonesian Village Laws number 6 of 2014. The Village Laws is a legal umbrella for the implementation of village governance towards strong, advanced, independent and democratic village communities. There are 6 points of policy direction and strategy of village development contained in the National Medium Term Development Plan or in Indonesian language namely 'Rencana pembangunan Jangka Menengah Nasional' 2015 - 2019 (RPJMN 2015-2019) [26].

Three of the six RPJMN 2015-2019 points are:

1. Development of human resources, culture, and socio-cultural capital of village communities.
2. Strengthening of village government and village communities.
3. Management of natural resources and sustainable environment, spatial arrangement of rural areas, and realizing food self-sufficiency

To carry out the mandate of the constitution, the Ministry of Village, Development of Disadvantage, and Transmigration (MVDDT) is the most likely government agency to carry out this mandate. Related to the main tasks and functions, MVDDT formulate the direction of village policy as follows [27]:

1. The aim of the village policy direction: improving the welfare and quality of life of the village community.
2. Strategic objectives: reduced number of villages left behind at least 5,000 villages or increasing number of independent villages at least 2,000 villages.
3. The direction of the President of the Republic of Indonesia in relation to the Village Laws:
  - a. Focused development on villages, especially in 1,138 villages in border areas
  - b. Accompaniment of Village.
4. Priority focus:
  - a. Guarding the implementation of the Village Laws especially for rural development, empowerment of rural communities, and rural development.
  - b. 74,093 villages and especially 39,086 villages are left behind and 17,268 villages are very lagging behind

To implement the village policy direction, the MVDDT issues a regulation of the Village Minister [27]:

1. Village Minister's Regulation no. 2 of 2015 on the Code of Conduct and the Decision Making Mechanism of Village Deliberations.
2. Village Minister's Regulation no. 4 of 2015 on Establishment, Arrangement and Management, and Dissolution of Village Owned Enterprises.

#### V. EA FUNCTION : a PERSPECTIVE of VILLAGE LAWS

Demographic analysis illustrates that government is an organization that still a target of EA utilization. Of the fourteen defined EA functions there are three functions major that correspond to the issue of the Village Laws. That three functions of EA are: reduce complexity, anticipate change, and aligning.

Reduce Complexity, because it involves the problem of: large coverage (seventy-three thousand villages), human resource empowerment issues, to manage natural resources,

cross-sectoral from several ministries. Anticipate Change, concerning the information age where environmental change is very fast, both the business environment and the technological environment. Government agencies should anticipate changes that occur so that villages can follow the dynamics of the change. Aligning, concerning the efficiency and effectiveness of information technology as a tool for the achievement of the Village Laws.

#### VI. DISCUSSION

The EA can be used as a guide how information technology is implemented. One of the implementation of information technology is DSS. DSS is built to support the solution of an issue or to evaluate an opportunity. Figure 4 shows the system architecture of the Village Laws where the system provides support for village development decision making.

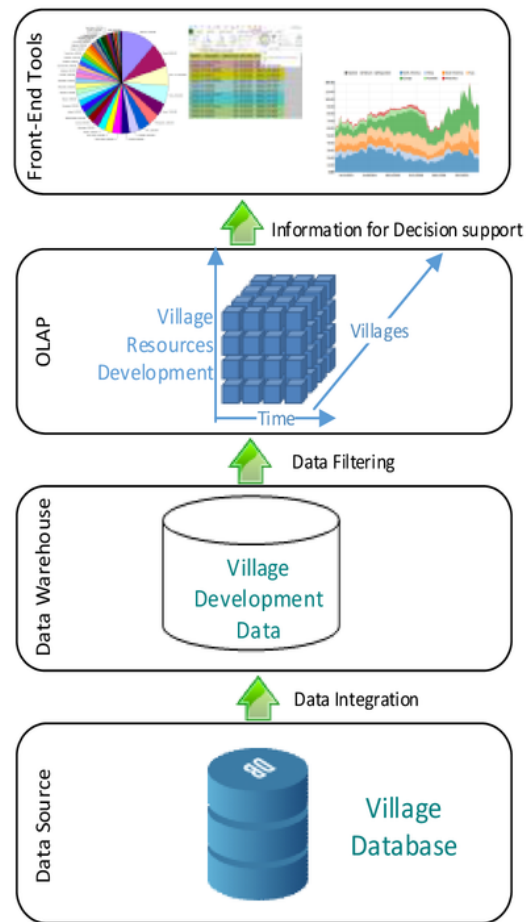


Figure 4. System Architecture

The architecture system of the the Village Laws is made up of the village database source. Village needs are identified and arranged in database format and then data are entered by each village into the village data source. Then Data source is integrated into the data warehouse. The data warehouse is

extracted, transformed, and loaded into the Online analytical Processing (OLAP). The end result of OLAP is information that can be used as decision support.

## VII. CONCLUSION

The Village Laws have been implemented since 2014. To implement the Village Laws requires tools to optimally reduce complexity, anticipate of change, and align between business and technology. One of perspective the EA is how to implement DSS on village laws to reduce complexity, to anticipate change, and to align between organization and technology. The ultimate goal is to reach a participatory and a just village.

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