

# An Enterprise Architecture Plan For The Regional Office Of Kementerian Agama Lampung Province Using Feaf

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**Abstract—Abstract—The Regional Office of Kementerian Agama Lampung Province does not yet have a specific system and has not been integrated between sections or work units. In addition, documents and data in each work unit have so far been stored on personal computers (PCs) used by each staff in each work unit, and not all staff have backed up data periodically to offline media (external hard disk). This is of course a high risk of data damage/loss and allows for irregularities to occur in the services provided. This research aims to design enterprise architecture (EA) using FEAF framework to solve the problem. The process carried out from identification of internal and external conditions, identification of current and future business needs, creating and clarifying architectural models based on metrics and identification of business architecture, data or information, applications and technologies from the collected data. The results of this research to designing new models by using FEAF EA.**

Keywords : FEAF, Enterprise Architecture, Kementerian Agama Lampung Province

## I. INTRODUCTION

In carrying out its duties, the Kementerian Agama has regional office representatives in each province, one of which is the Regional Office of the Kementerian Agama (Kanwil Kemenag) Lampung Province. The Regional Office is in charge of many fields, including: Madrasah Education, Religious Education and Islamic Religious Education, Hajj and Umrah Organization, Islamic Religious Affairs, Islamic Information and Zakat and Waqf Empowerment, and Hindu Community Guidance. In order for the implementation of tasks in each of these fields to run optimally, there is a need for system integration between these fields. Therefore, it is necessary to design an Enterprise Architecture (EA) which can be used as a direction for the development of information technology at the regional office.

The use of the framework in modeling enterprise architecture is also carried out in several government agencies which aims to answer the needs and changes in the organization that continues to grow. The Kementerian Agama has a vision to become a professional and reliable Kementerian Agama in building a pious, moderate, intelligent and superior society to realize an advanced Indonesia that is sovereign, independent, and has a personality based on mutual cooperation. To realize the vision and mission, the Kementerian Agama must have adequate facilities in order to carry out its business processes, while in the current business process, the Kementerian Agama of Lampung Province does not yet have automation and integration of business processes between sections or work units.

The Provincial Office of the Kementerian Agama uses computer equipment in their daily activities in each work unit, but it has not been systemized specifically where all activities have not been connected or integrated between sections or work units. In addition, documents and data in each work unit have so far been stored on personal computers (PCs) used by each staff in each work unit, and not all staff have backed up data periodically to offline media (external hard disk). This is of course a high risk of data damage/loss and allows for irregularities to occur in the services provided. Given the importance of optimal service and good data security at the Provincial Office of the Kementerian Agama. From the problems faced by the Provincial Office of the Kementerian Agama, it can be concluded that there is a need for a solution in the form of enterprise architecture modeling that views the different elements in an organization/company as a whole as a whole. To develop and manage enterprise architecture, it is necessary to adopt or develop the framework and methodology for enterprise architecture. FEAF has several advantages when compared to several frameworks such as Zachman, Wards & Peppard and TOGAF. FEAF is more flexible because it combines the three frameworks at each level and also the reference model for each sub-architecture already exists and is good enough to guide users of the framework to build strategic plans. FEAF also has a life cycle that can be used to develop an architecture that is better than the three frameworks. FEAF has planning, analysis, design, implementation and monitoring phases where

Zachman, Wards & Peppard and TOGAF do not have these five phases.

## II. LITERATURE REVIEW

The Federal Enterprise Architecture Framework or abbreviated as FEAF is a conceptual model that formulates organizational goals and visions in a documented manner and has a coordinated structure between business lines between departments. Business, information needed to support business, technology to support business operations, and the process of moving from old technology to new technology can be done with this framework.

FEAF also supports enterprise architecture components, namely business, data, application, and technology architectures. In addition, FEAF has adopted three main columns from the Zachman framework, which consist of data description, function description, and network description. In FEAF there are 6 parts of the architecture, each part has a reference model that can be used as an architectural model, namely:

- 1) Strategy
- 2) Business
- 3) Data
- 4) Application
- 5) Infrastructure
- 6) Security

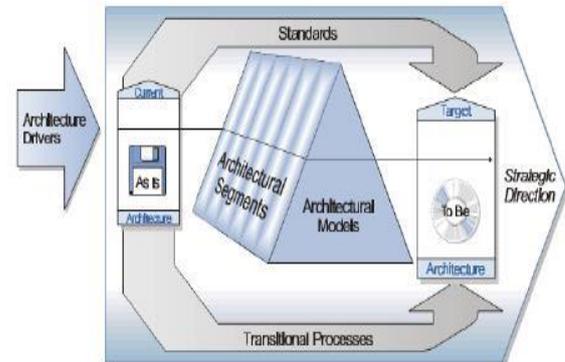
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FEAF provides standards for developing and documenting architectural descriptions of areas of high priority. FEAF is suitable to describe the architecture for the Federal government. The process trace yields four levels of the Federal Enterprise Architecture Framework. Each level provides an understanding or frame of reference for the following year. Level three, describing the development of the eight components is increasingly detailed that leads to a logical structure for classifying and organizing a descriptive description of Federal companies at level IV [2].

### Level I

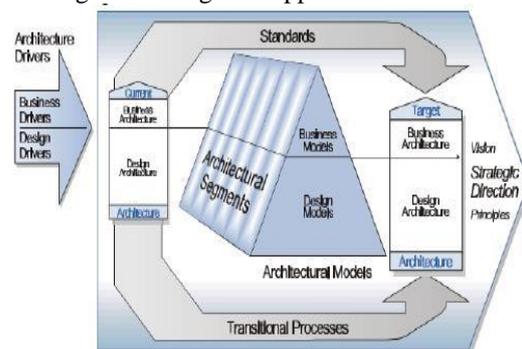
Level I is the highest level of the FEAF and introduces the eight components required to develop and maintain the Federal enterprise

architecture. One external component framework, driver architecture, the other seven internal. As shown in the figure below, the flow of the framework is from left to right and represents the continuous process of Federal enterprise architecture.



### Federal Enterprise Architecture Framework Level I Level II

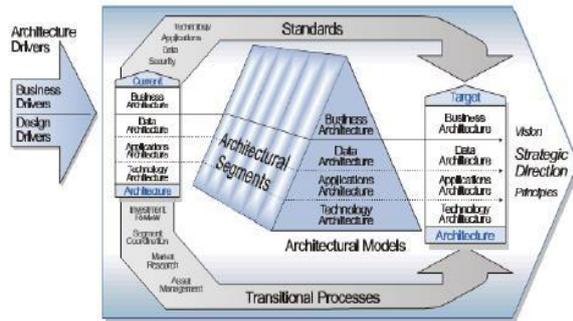
Level II shows at a greater level of detail, the business and design elements of the Federal enterprise architecture and how they relate to each other. Viewed horizontally, the top half of the framework deals with the company's business, while the bottom half deals with the architectural design used to support the business. The business and design relationship is a pull/pull in which the business pushes design and design (i.e., new developments in data, applications, and technology) pulls the business to a new level of service delivery in support of business operations. Examples of design drivers are the Internet and electronic access to public services, creating challenges for design to support business missions.



### Federal Enterprise Architecture Framework Level II

### Level III

Level III extends parts of the design framework to represent three architectural designs: data, application, and technology.



Federal Enterprise Architecture Framework Level III

Level IV

Level IV identifies the type of model that describes the business architecture and three architectural designs: data, application, and technology. This constitution also stipulates architectural planning companies. At level IV, how this business architecture is supported by three architectural designs begins to develop and is made explicit.

Enterprise architects and engineers have historically used models as their primary descriptive method. John Zachman and Steven Spewak are two of the many recognized leaders in architectural conceptualization and architectural planning firms. This is key at level IV in that it presents the transition from a general to a more specific set of methods and approaches.

The image below describes, with minor changes, how the Federal Enterprise Architecture Framework combines the five-line perspective (i.e., views) and three architectural artifact or column abstraction products of the Zachman Framework. Level IV shows the architectural design as the column head. Planners and line owners focus on business architecture definitions and documentation. When finished, this line makes explicit what the company is in business and what information is used to do that (i.e., the business model).

Perspectives	Data Architecture (entities = what)	Applications Architecture (activities = how)	Technology Architecture (locations = where)
Planner's View Objectives/Scope	List of Business Objects	List of Business Processes	List of Business Locations
Owner's View Enterprise Model	Semantic Model	Business Process Model	Business Logic System
Designer's View Information Systems Model	Logical Data Model	Application Architecture	System Geogr Deployer Architecture
Builder's View Technology Model	Physical Data Model	System Design	Technology Architecture
Subcontractor's View Detailed Specifications	Data Definition "library or marketplace"	Programs "Supporting Software Components (e.g., operating systems)"	Network Architecture

Federal Enterprise Architecture Framework Level IV

The figure above explains, with minor changes, how the Federal enterprise architecture framework incorporates the five-line perspective (i.e., views) and the three-architecture artifact or column abstraction product of the Zachman framework. Level IV shows the architectural design as the

column head. Planners and lines focus on business architecture definitions and documentation. When finished, this line makes explicit what the company's business is and what information is used to do that (i.e., the business model).

In data analysis requires techniques in the process, as for the techniques are as follows;

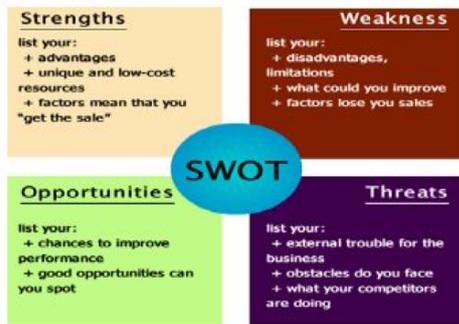
1. PEST

PEST is an analysis of external business environmental factors that include the political, economic, social and technological fields [3]. PEST is used to assess the market of a business unit or organizational unit. Directional PEST analysis is a framework for assessing a situation and assessing a strategy or position, company direction, marketing plan or idea. In this analysis a new opportunity or threat can be taken for the company. The four factors that are components of PEST are as follows:

- a. Political factors, including government policies, legal issues, and include the formal and informal rules of the environment in which the company carries out activities. Example: Policies on taxes, labor regulations, trade regulations, political stability and local regulations.
- b. Economic factors, including all factors that affect the purchasing power of customers and affect the climate of a company's business. Examples: economic growth, interest rates, exchange rate standards, inflation rates, prices of products and services.
- c. Social factors, including all factors that can affect the needs of customers and affect the size of the existing market share. Examples: community education level, population growth rate, social environmental conditions, working environment conditions, safety and social welfare.
- d. Technological factors, including all things that can help in dealing with business challenges and support the efficiency of business processes. Examples: technology research and development activities, automation, technology transfer speed, technology expiration rate.

2. SWOT analysis

SWOT analysis is a method to identify various actors systematically to formulate strategies based on the obtained logic, maximize strengths, and opportunities, then simultaneously minimize weaknesses and threats [3]. The SWOT analysis compares the external factors of opportunities and threats with the internal factors of strengths and weaknesses as for the explanation of the SWOT diagram, as shown in Figure 2.5 below:

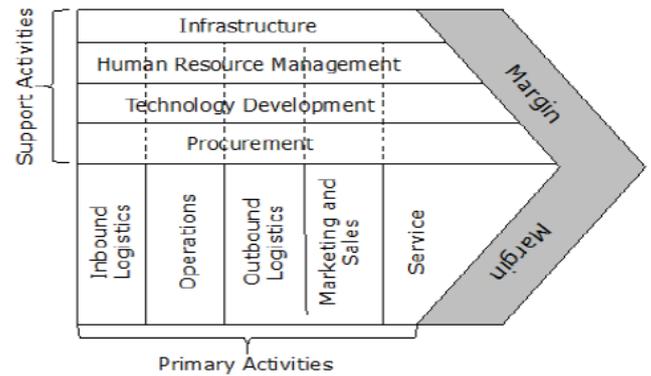


Based on Figure 2.5, the SWOT model is described as follows:

- Strength is something that can be done well by the company or a characteristic that can increase the company's competence, which strength can be in the form of physical assets, company expertise / specialization, reliable human resources, quality and innovative products, company position in market share.
- Weaknesses are deficiencies that exist in a company, these weaknesses can be in the form of lack of human resource capabilities and expertise, lack of supporting company assets, lack of strategies in terms of promotion and marketing, and it could also be unclear business processes and poor coordination. .
- Opportunities are an important factor that needs to be considered in formulating a company's strategy.
- Threat is a threat or challenge that needs to be aware of and anticipated because if not, then this threat can make the company suffer losses or fail in competition. These threats can be in the form of the emergence of new competitors, competitors having better resources, and possibly threats from internal parties.

### 3. Value Chain

Value Chain Analysis was proposed by Michael Porter in 1984 [3]. According to Porter, every company is a collection of activities carried out for production, marketing, shipping and product support [3]. This analysis is done by looking at the internal business environment that focuses on the main activities and supporting activities. Activities are carried out by looking at the tasks and functions of each organizational field. The principle of the value chain is how to map the entire work process or activity within the institution into two parts, namely, main activities and supporting activities. The purpose of this analysis is to create competitive capabilities in the organization. The generic value chain formulated by Michael Porter is as follows [3]:



The following activities are included in the company's value chain according to Michael Porter [8]:

#### a. Primary Activities:

- Inbound Logistics (Inbound Logistics)**  
Activities related to the management of raw materials until the raw materials can be used in the production process.
- Operation (Operation)**  
Activities related to converting inputs into the form of final products (outputs), such as machinery, packaging, assembly, equipment maintenance, testing, printing, and facilities in operating activities.
- Outbound Logistics**  
Activities related to the collection, storage and physical distribution of products to buyers, such as goods warehousing, material handling, delivery operations vehicles, order processing and scheduling.
- Marketing and sales (Marketing and Sales)**  
Activities associated with providing a means by which buyers can purchase products and encouraging them to do so, such as advertisements, brochures and promotions.
- Service (Service)**  
Activities related to providing services to increase or maintain product value, such as installation, repair, training and product adjustment.

#### b. Support Activities

- Purchase (Procurement)**  
Activities related to all suppliers (Supplier).
- Technology Development**  
Activities related to all technology development.
- Human Resource Management**  
Activities related to all human resources.
- Company Infrastructure (Firm Infrastructure)**  
The company's infrastructure consists of a number of activities including general management, planning, finance, legal, government affairs and quality management.

#### 4. Business System Planning (BSP)

It is a structured methodology or approach with the main focus on how information systems are structured, integrated, and implemented over a long period of time [1]. The basic concepts of BSP are related to the long-term goals of IT in an organization, namely;

- a. Information systems must be supported by business goals and objectives.
- b. Strategy Information systems must be recognized at all levels of management.
- c. Information systems must consistently provide information at every layer of the organization.
- d. Information systems must be able to withstand any changes in management. Information systems strategy must be implemented in each subsystem described in the information architecture.

The key to success in planning, developing and implementing an information architecture is the effective support of business objectives, such as;

- a. Top-down planning with bottom-up implementation
- b. Organize data as enterprise resource
- c. Oriented to all business processes
- d. Thorough use of the methodology.

### III. PROPOSED METHOD

This study will discuss the process of developing the IT blue print needed to support the performance improvement of the Regional Office of the Ministry of Religion of Lampung Province. Related to this, the method chosen in this study is FEAF, which has several stages that refer to four levels, the stages of this research can be seen in the picture below.

Based on the picture above, the research was conducted through four levels, each level has several steps, namely:

#### 1) FEAF Level 1

Level 1 is an identification of the condition of the Regional Office of the Ministry of Religion of Lampung Province globally which aims to collect information about the Regional Office of the Ministry of Religion of the Province of Lampung.

The steps are:

- a. Conducting a literature study from several sources as a reference for designing an enterprise architecture that is in accordance with the conditions of the Regional Office of the Ministry of Religion of Lampung Province. Some of the materials that have been studied in the literature include:

- i. Journal of "Hospital Reporting Information System Architecture Modeling Using FEAF" by Hadiansyah Ma'sum in 2014,

- ii. Journal of "Enterprise Architecture Design for Kir Test Registration Using FEAF at DISHUB Sukabumi" by Asep Sutiawan, Risa Sri Marlianti, Salsa Tini Kareksi, Sub-Department of Saepudin in 2020,

- iii. Journal of "Proposed FEAF Model for Strategic Planning of Information Systems at PT. Sumber Buana Motor Yogyakarta" by Erik Setiawan, Irya Wisnubadhra, Sapty F. Rahayu in 2015,

- iv. Journal of "Information Architecture Framework Design for Government Agencies in Indonesia" by Khakim Ghazali in 2015,

- v. Journal of "Development Studies and Proposed Design of Enterprise Architecture Framework" by Sofian Lusa, Dana Indra Sensuse in 2011,

- vi. Journal of "Development of Enterprise Architecture Framework" by Nadya Safitri, Rully Pramudita in 2017,

- vii. Journal of "Achieving CMMI Maturity Level 3 by Implementing FEAF Reference Models" by Fatemeh Kafili Kasmaee, Ramin Nassiri, Gholamreza Latif Shabgahi in 2010,

- viii. Journal of "A systematic literature review: Critical Success Factors to Implement Enterprise Architecture" by Rizal Ansyori, Nanik Qodarsih, Benfano Soewito in 2018,

- ix. Journal of "Developing a Method to Leverage FEAF by Deploying Val IT Enablers" by Parvaneh Afzali, Javad Rezapour, Zahra Rezapour, Milad Hemmatnezhad in 2016,

- x. Journal of "E-Government Architectural Planning Using Federal Enterprise Architecture Framework in Purwakarta Districts Government" by Meriska Defriani, Mochzen Gito Official in 2019

- xi. The Profile Book of the Regional Office of the Ministry of Religion of the Province of Lampung and the book "The Regional Office of the Ministry of Religion of Lampung Province in Figures in 2021"

- b. Collect documents from the Regional Office of the Ministry of Religion of the Province of Lampung relating to the conditions, goals and objectives of the Regional Office of the Ministry of Religion of the Province of Lampung. Data collection is done by observation and interviews. In general, interviews are carried out simultaneously with observation activities, because at the time of the interview, the interviewer needs to visit the resource persons who are in the Regional Office of the Ministry of Religion of Lampung Province. So you can make direct observations. The interview process is addressed to the head of the sub-section/sub-coordinator or the party in accordance with the research needs.

The results of the interview were strengthened by observations on the condition of the Regional Office of the Ministry of Religion of Lampung Province. The data obtained from the interview and observation process at the Regional Office of the

Ministry of Religion of Lampung Province are as follows:

- i. Book Profile of the Regional Office of the Ministry of Religion of Lampung Province
  - ii. SK correction sheet for each subsection of the Regional Office of the Ministry of Religion of Lampung Province
  - iii. Organizational structure
  - iv. Employee Data of the Regional Office of the Ministry of Religion of Lampung Province
  - v. List of tasks and functions
  - vi. Plan of the Regional Office of the Ministry of Religion of Lampung Province
  - vii. Appraisal of Civil Servant Work Performance
  - viii. Assessment of Functional Position Credit Score
  - ix. Monitoring and evaluation form for each field and subsection
- c. The results of the interview show the condition of the Regional Office of the Ministry of Religion of Lampung Province, as well as the potential in the form of strengths and weaknesses it has.

#### 2) FEAF Level 2

Level 2 is to identify the current business processes/requirements and those that will be needed in the future. The steps are:

- a. Reviewing the results of interviews regarding valuable daily, monthly and annual activities for the Regional Office of the Ministry of Religion of Lampung Province.
- b. Make proposals for important and necessary business processes for the Regional Office of the Ministry of Religion of Lampung Province in the future.
- c. Analyze and classify business processes against the value chain, to identify the main activity groups and supporting activities.

#### 3) FEAF Level 3

Level 3 is identifying and modeling the information architecture in the form of an overview of the database that will be used to accommodate the information system. The steps are:

- a. Transforming structured business processes into business architecture.
- b. Designing data classes and relationships with business processes.
- c. Create a database design to accommodate the proposed information system.

#### 4) FEAF Level 4

Level 4 is the creation and classification of enterprise architecture models based on the FEAF matrix.

From the 5x3 matrix, it can be seen that FEAF is a derivative of the Zachman Framework, namely by referring to the five rows from the perspective and the first three columns from the product. This level shows the design architecture as a column header, while the planer and owner perspectives focus on the definition of business architecture and

documentation. Each row of the matrix represents a holistic view of the solution.

The higher perspective does not require a comprehensive understanding than the lower perspective. In other words, the top row is described in detail on the bottom row. Further understanding of the five FEAF perspectives are as follows;

1. Planner's perspective, explaining views or estimates of the scope of the system to be developed, the three defined cells are as follows;

- a. The What column (List of Business Objects) contains data or information needed for the continuity of business functions.
- b. The How column (List of Business Process), contains the business processes that occur at the Regional Office of the Ministry of Religion of Lampung Province which aims to achieve the agency's performance goals.
- c. The Where (List of Business Locations) column contains a general description and geographical condition of the Regional Office of the Ministry of Religion of Lampung Province.

2. Owner's perspective, describes the enterprise model which is a business design and shows business entities, processes and their relationship. The three cells are defined as follows;

- a. Column What (Semantic Model), is a data that is used to make it easier to design the database.
- b. The How column (Business Process Model) contains an activity diagram that shows system activities in the form of a collection of actions, how each action starts, until the action ends. Activity diagrams can also describe more than one process at the same time.
- c. The Where (Business Logistics System) column contains a more specific description of the location used to carry out business processes at the Regional Office of the Ministry of Religion of Lampung Province.

3. Designer's perspective, explains that the system model that is designed must show data elements, process flows and functions that describe entities. The three cells defined are as follows;

- a. The What column (Logic Data Model) contains the Entity Relationship Diagram (ERD) system structure in terms of defining the classes that will be created to build the system. Classes have what are called attributes and methods or operations.
- b. The How column (Application Architecture) contains the application architecture that describes the proposed information system.
- c. The Where column (System Geographic Deployment Architecture) contains a logical model of the connectedness of nodes on a network and an overview in the form of a network topology.

4. Builder's perspective, explains the technology model that must be adapted to the information system model such as input/output devices or other technology needs. The three cells defined are as follows;

- a. The What (Physical Data Model) column contains a physical data model which is represented as a table along with the attributes that will be used to build the system to be created.
- b. The How (System Design) column contains the input to be processed and the output generated by the system.
- c. The Where (Technology Architecture) column provides a physical description of the technology needs at the Regional Office of the Ministry of Religion of Lampung Province, these needs are in the form of hardware, software and system software or operating systems.

5. Subcontractor Perspective, describes the detailed specifications used before the system is implemented. The three cells identified are as follows:

- a. The What (Data Definition) column contains Data Definition Language (DDL) which are the commands used to define the structure of the database.
- b. The How (Programs) column contains the methods needed to build the system
- c. The Where (Network Architecture) column contains the network architecture, namely addressing each node on the network so that they can communicate with each other.

### 3.2 Tools

The tools used for smoothness in this research are as follows..

#### a. Hardware

A set of computers with a Pentium processor or its class, at least 2 GB RAM, 320 GB hard disk.

#### b. Software

Microsoft Windows 7 Operating System.

## IV. CONCLUSION

This research produces an enterprise IT architecture design in designing the architecture business and formation systems to optimize the use of IS / IT. Furthermore, enterprise architecture design can be done make automation and integration of all business processes between divisions / work units at Regional Office of Kementerian Agama Lampung Province optimal. Everal information systems that exist in Regional Office of Kementerian Agama Lampung Province have been identified before the implementation of FEAF. It is hoped that the FEAF design will facilitate the development of an information system that can provide convenience to all.

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