

# Development of Enterprise Architecture in Senior High School Using TOGAF as Framework

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**Abstract** Information Technology in supporting the running of business processes is currently urgently needed, this role is to support the running of organizational performance in achieving the vision of the organization that has been implemented, one of which is education institutions, especially high schools. SMA 123 which is located in the city of Bandung has implemented Information Technology, only in the application of information technology has not been able to integrate systems between parts. The system implemented between sections still stand alone and its impact on the difficulty of the management of the school to obtain statements that involve cross-section so that in making decisions requires a relatively long time. The system can integrate between parts of the organization and can provide the information needed by the organization to support the decision-making process using Architectural Design Company uses the TOGAF (The Open Group Architecture Framework) with the ADM (Architecture Development Method) method, which consists of the Preliminary stage, Architectural Vision, Business Architecture, Information Systems, and Architectural Technology.

**Keywords** ADM, Enterprise Architecture, Business Process, School, TOGAF

processes.

Currently the high school (SMA) State 123 Bandung flurry of activity have been using information technology, but from the application of information technology is still a shortage that is, not yet integrated system implemented in supporting business processes. Between department has a system of its own, such as: data processing attendance of students already use attendance system is digital, but the recapitulation of student attendance data cannot be used directly by the academic part in a recap on student attendance, because the system is used between the system of attendance and academic students use devices different technologies. This can lead to management difficulties getting reports of cross section, although it can be used as a reference in making a decision [31][32][33].

Based on the description above, the application of information technology in SMAN 123 Bandung yet integrated,

These conditions have an impact on the need for an integrated system. It takes the architectural design with dedicated framework for the realization of the need for a system that is effective and efficient; it can use the Framework in the form of The Open Group Architecture Framework (TOGAF). TOGAF framework provides a detailed method on how to build, manage, and implement a framework and information system called the Architecture Development Method (ADM), which can be made on the development of an integrated system[30].

## I. Introduction

### 1.1. Background

Information technology has such an important role as one of supporting the business processes of an organization. The role that information technology can provide guidance in integrating systems between sections within the organization and a reference for the management in taking a decision.

School (SMA) 123 in the city of Bandung as one of the organizations working in the field of educational services is now applying information technology in business

### 1.2. Research Identifications

This research has the goal to increase competition in various activities at SMAN especially in Bandung, by implementing the strut system with information technology; only problem is the application of information technology is not in accordance with the vision, mission and goals of the organization.

Things that can be identified include:

1. Implementation of Information Technology does not yet have an integrated system model and framework

- Implementasi Information Technology does not have a blueprint in an effort to promote the availability of information systems

### 1.3. Research Questions

To analyze the needs of information technology and information systems, the writers ask questions as follows:

- Why Enterprise Architecture is required by Senior High School (SMAN) 123 Bandung?
- What are the benefits of Enterprise Architecture for Senior High School (SMAN) 123 Bandung?
- What should be done so that organizations such as Senior High School (SMAN) 123 Bandung can be better defined?
- Why Enterprise Architecture Design using TOGAF ADM approach is used to define Senior High School (SMAN) 123 Bandung Enterprise Architecture?
- How to design information systems architecture for Senior High School such as Senior High School (SMAN) 123 Bandung?

### 1.4. Research Objectives

The objectives to design the information systems architecture are:

- Designing Arsitektur Enterprise School (SMA) SMA 123 in Bandung.
- Integrating Information Systems in 123 Public High Schools in Bandung City so that it can facilitate in generating cross-section information to facilitate decision making.

### 1.5. Scope and Limit to the Research

Scope of research's problem in the development of information systems architecture for SMAN 123 Kota Bandung that will be developed, such as:

- Planning information system architecture using the TOGAF ADM framework, which includes: Architecture Vision, Business Architecture, Information System Architecture, Technology Architecture.
- The final result of designing enterprise architecture in Bandung Public High School 123 in the form of an Information System Implementation Roadmap.
- The architectural plan that will be built is in the form of:
  - Data architecture
  - Software architecture
  - Information technology architecture

### 1.6. Research Methodology

Architectural models development methodology that we will be used is TOGAF ADM framework, stages of the

development are:

- Interview, namely data collection to obtain information directly from the source.
- Observation, which is direct observation to the object of research to see activities carried out up close.
- In the development of enterprise model architecture, the development used in the form of TOGAF ADM, there are stages of TOGAF ADM: a. Initial Phase / Phase: Open Group Architecture Framework (TOGAF) with Architectural Development Method (ADM) in producing a System blueprint, b. Stages / Management Phase Requirements with sequence: Phase / Phase A: Architectural Vision, Phase / Phase B: Business Architecture, Phase / Phase C: Information System Architecture, Phase / Phase D: Technology Architecture and Phase / Phase E: Opportunities and Solution

## 2. Methodology

### 2.1. Enterprise Architecture

Definition of Enterprise Architecture, such as:

- Descriptive representation (model) that is relevant to describe an enterprise and what should be produced to meet the needs of management or organization [14].
- The mapping of blueprint that show the relationship between components and all the people working in the company consistently to improve cooperation/collaboration, and coordination among them [13][15][16][30].
- A mechanisms to ensure information technology resources of an organization might be in line with the strategy of the organization [8][17][18].

### 2.2. TOGAF

TOGAF (The Open Group Architecture Framework) is an architectural framework that provides a complete methods and tools to assist in the acceptance, production, use, and maintenance of enterprise architecture [1].

### 2.3. Method TOGAF ADM

Architecture Development Method (ADM) the logic of TOGAF methodology, which consists of eight major phases for the development and maintenance of technical architecture of the organization. ADM to form an iterative cycle for the entire process, between the phases, and in each phase in which at each iteration a new decision to be taken. The decision was intended to determine the extent of the enterprise scope, level of detail, the time target to be achieved and architectural assets to be excavated in the enterprise [4][19][20].

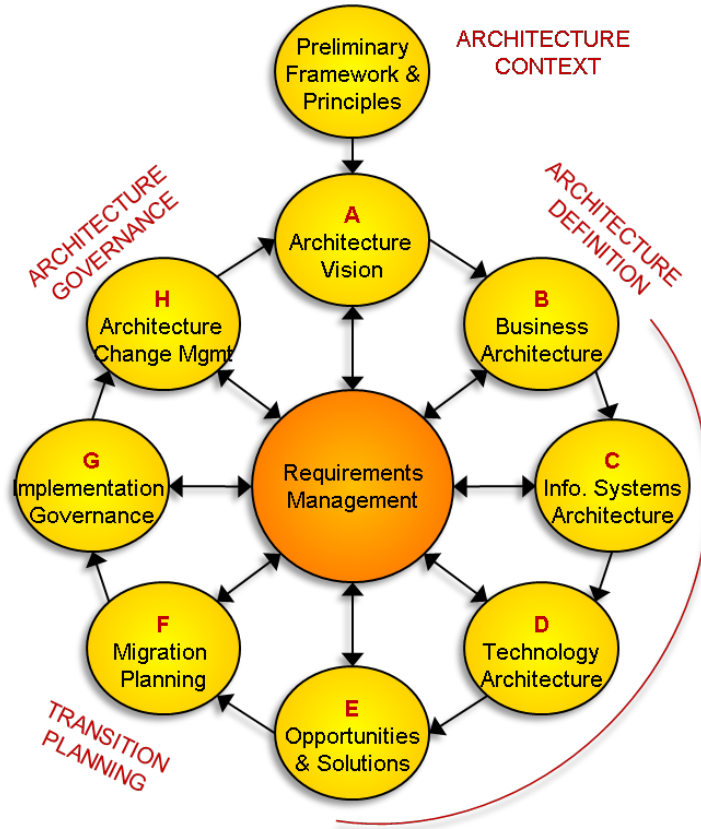


Figure 1. TOGAF ADM Components

### 3. Results

#### 3.1. Metode Perancangan Arsitektur Enterprise

SWOT Analysis: To determine the right strategy, factors must first be known as strength, weaknesses, opportunities, and threats.

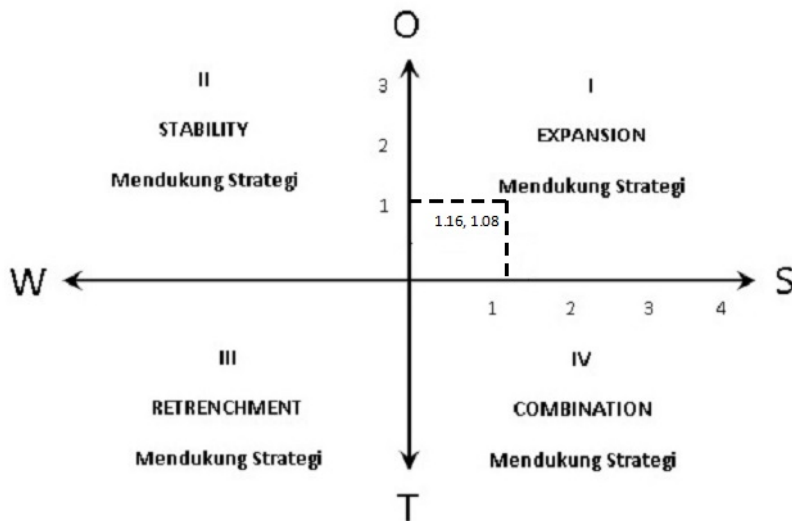


Figure 2. SWOT Matrix Analysis

Value Chain Analysis: Analysis of the value chain aims to classify the existing activities in SMA 123 Bandung:



Figure 3. SMAN 123 Bandung Value Chain

### 3.2. Business Architecture

**Business Architecture:** SMA 123 Bandung is an educational institution which is a service business processes and activities conducted SMA 123 duo to produce quality students [21][22].

**Gap Analysis Business Architecture:** Gap analysis of business is any gap or gaps that can be analyzed from the existing business processes. That the results of the Business Architecture modeling to meet the target to be achieved, step is to analyze the gap (Gap Analysis). The analysis conducted on business processes running at this time, then analyzing settlement solutions [23-29].

### 3.3. Information System and Technology

**Data Architecture:** At this stage a data class is defined that will be used in the application architecture. Data architecture is described by E-R diagram that describes the relationships between data and entities used in information systems.

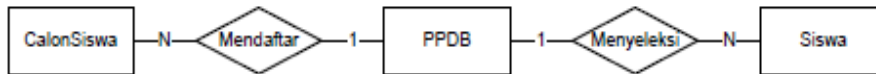


Figure 4. PPDB ER Diagram

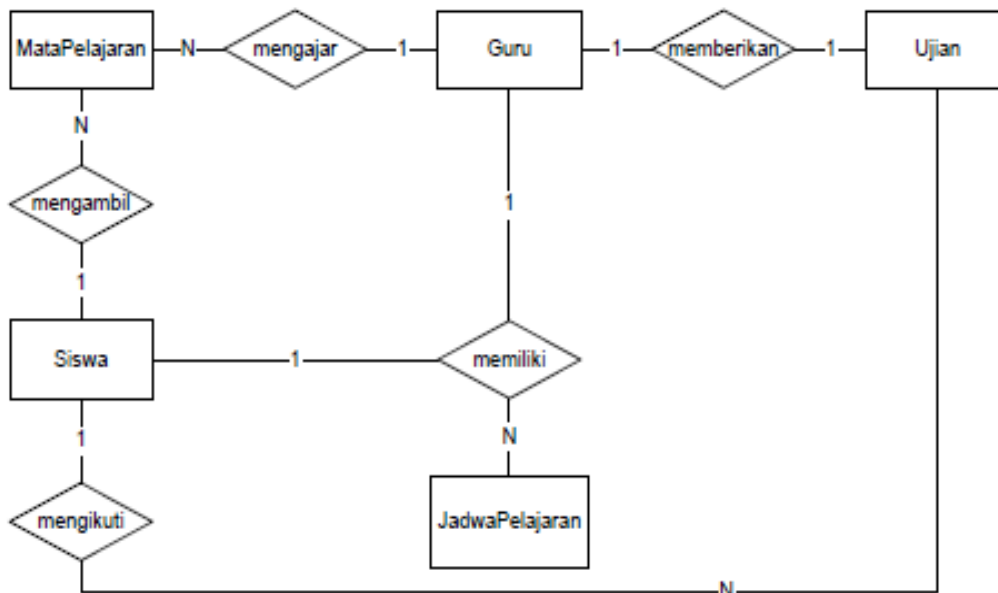


Figure 5. Learning Process Diagram

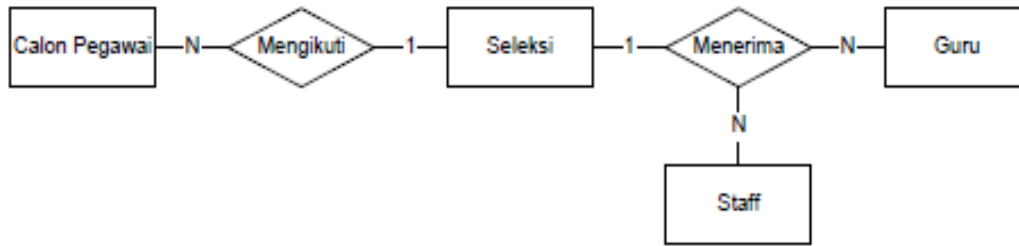


Figure 6. E-R Diagram of HR and General Sections

Architecture Technology: At this stage, it proposes the development of technology architecture to improve the performance of the system it has.

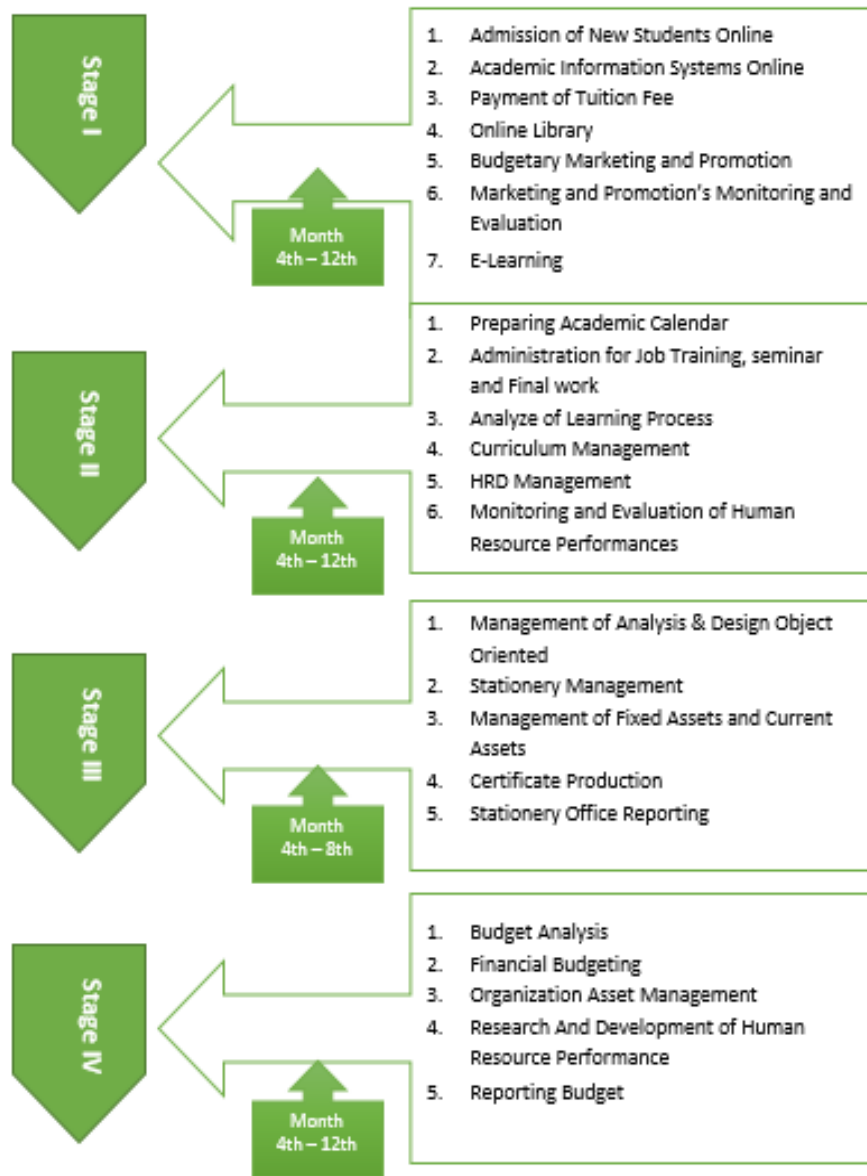


Figure7. The Roadmap Plan Technology of TOGAF ADM

## 4. Conclusions

### 4.1. Conclusions

Based on the stage that has been done in the previous chapter, it can be concluded as follows:

1. Diciptakan sebuah perencanaan untuk Sistem dan 1. Information Technology, data architecture (converting excel files into database files), application architecture (adding applications that support data processing), and technology architectures (adding application servers and databases).
2. Utilization of Information Technology in 123 Public High Schools in Bandung City is an important supporting factor, so that data processing can run more effectively and quickly in decision making.
3. The results obtained from enterprise architecture using the TOGAF ADM framework are known to be system requirements that are useful for supporting the business processes of Bandung City Public High School 123.

### 4.2. Suggestion

As a reference to create the next TOGAF ADM, we submitted some suggestions, as follows:

1. Further planning is needed at the next stage, namely: Phase E: Opportunities and Solutions, Phase F: Migration Planning, Phase G: Implementation Governance, and Phase H: Architecture Change Management.
2. Technology infrastructure in Bandung City Public High School 123 must be prepared so that the proposed implementation plan can be carried out in accordance with the planning.

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