ENTERPRISE ARCHITECTURE PLANNING (EAP) AS A STRATEGIC PLAN FOR INFORMATION SYSTEM MANAGEMENT TO IMPROVE THE SERVICE QUALITY FOR MULTAZAM VOCATIONAL SCHOOL IN GISTING

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Abstract

Information technology is moving more and more forward and developing from time to time. One of the roles of information technology which is growing is the use of information technology to improve the governance of educational institutions from high schools to universities. Every educational institution is required to have models and standards which can be implemented as a basis for improving the alignment between business strategy and information technology. Enterprise Architecture Planning or commonly called (EAP) is one method which can be applied in making information architecture plans. The stages in EAP consist of data architecture, application architecture, technology architecture, and designs which have been made and can be implemented to support the achievement of the organization's mission. The system design uses flowchart design, use case diagrams, and class diagrams. Research conducted at Multazam Vocational School in Gisting resulted in a strategic design. The information system of Multazam Vocational School in Gisting is based on Android as an effort to improve service quality. With good management of information systems at Multazam Vocational School in Gisting, it will make easier for all parties to interact. The school can provide information to prospective students to access information easily. All the information needed by the community can be easily obtained without having to come directly, and enough with a smartphone and online.

I. INTRODUCTION

Information technology is moving more and more forward and developing from time to time. This is a very important role for human life so it is needed in supporting activities such as news, job vacancies and all school systems. One system which is being widely used today is mobile technology on cellular phone devices especially smartphones. Smartphones are currently being used by the general public such as students and college students. One of the smartphones which uses the operating system is Android.

Based on statistical data by the STATISTA agency, the Android operating system was the most widely used smartphone operating system in Indonesia in 2014. At the end of that year, Android

had almost 60% market share, while at the end of 2015, Android users increased to 74%. In mid-2016, Android was still above 77% but still struggling to reach 80%. It is estimated that, at the end of 2016, 80% of smartphone users in Indonesia use Android (source: StatCounter Statista 2016) [1].

Research conducted by Helmi Fachrureza, et al (2021) [2] built an asset management system to replace the manual asset management system. Asset management development is carried out using the Enterprise Architecture Planning (EAP) method. The existence of an asset management system built at 5ᵗʰ Public Vocational School in Bandung can make it easier for schools to manage assets. Research conducted by Azhar Basir, et al (2019) [3] by using TOGAF ADM as an enterprise architecture planning work, academic information systems can produce a general architectural model which can be adapted to the vision and mission of STMIKMPB. The planning of this enterprise architectural model results in a performance improvement process and a comprehensive academic information system which is integrated with other related departments, so that the problems of service and information systems needed can be obtained quickly, precisely, and accurately. Research conducted by Santi Supardi and Rosida (2018) [4] develops and builds information systems to assist all business activities in achieving school management goals.

Due to the need for targeted information, the development of an information system is a good step for improvements in data management and services to students. To build an information system, it is necessary to have careful planning so that information circulation can be fulfilled in each unit of the school. This goal can be achieved if Multazam Vocational School in Gisting builds an enterprise architecture to develop an integrated information system and in accordance with organizational goals.

II.   THEORETICAL BASIS
2.1. Information System Concept

According to Elisabet Yunaeti A. and Rita Irviani (2017), an information system can be defined as an organized combination of people, hardware, software, communication networks and data resources which collect, transform and disseminate information within an organization. This combination works to obtain information to support the making of a particular policy or decision [5]–[9].

The components of the Information System are:

a.   The input component is a medium which functions to enter data from outside into memory to produce the required information.

b.   Process component is a data which is processed to produce the required information.

c.   Component Output is a result of quality information for all system users.

d.   The Control Component is a component which is useful for controlling disturbances to the Information System.

One of the advantages of Information Systems is as a means of decision making. With Information Systems, we can find out the impact or risk of the decisions we take, whether it benefits one party or both parties who are in trouble [10].

2.2. Vocational High School

Vocational Secondary Education is secondary education which has the main objective of developing students' abilities to carry out certain types of work. Vocational Secondary Education prioritizes preparing students to enter the workforce and developing professional attitudes. Vocational High Schools organize educational programs which are tailored to the types of employment (Government Regulation No. 29 of 1990). Vocational High School is a form of formal education unit which organizes vocational education at the secondary education level as a continuation of SMP, MTs, or other equivalent forms. Schools at the level of education and type of vocational education can be called Vocational High Schools or Vocational Madrasah Aliyah, or other equivalent forms (Law on National Education System Number 20 of 2003) [11][12]–[14].

2.3. Enterprise Architecture Planning (EAP)

Enterprise Architecture Planning (EAP) is an approach created by Steven H. Spewak to build enterprise architecture based on data driven and business driven. Enterprise Architecture Planning (EAP) is the process of defining the architecture in the use of information to support the business and plans to implement that architecture (Spewak 1992).

EAP is the process of defining architectures for the use of information which supports business processes, and includes plans for implementing enterprise architectures[15]–[18].

2.4. SWOT analysis

Strength Weakness Opportunities Treats Analysis (SWOT) is a planning method used to evaluate strengths, weaknesses, opportunities, and threats in a project or business speculation. These four factors make up the acronym SWOT (Strength, Weaknesses, Opportunities, Threat)[19]–[22].

SWOT analysis is the recognition of several influential aspects in a structured way to formulate industrial strategy. The logic which is built in the application of this analysis is to optimize the strength and opportunity factors, but simultaneously be able to minimize weaknesses and threats. Decision-making procedures in determining this strategy are often closely related to the achievement of the vision, mission, goals, and industrial strategies and policies. Therefore, strategy design is imperative to analyze the dominant strategic factors in the industry related to strengths, weaknesses, opportunities and threats according to the latest site (Rangkuti, 2009).

III. RESEARCH METHODS

3.1. Enterprise Architecture Planning (EAP)

Enterprise Architecture Planning has 7 (seven) main components which show the stages for determining and planning the implementation of information system architecture. These seven main components are grouped into 4 (four) parts [23].
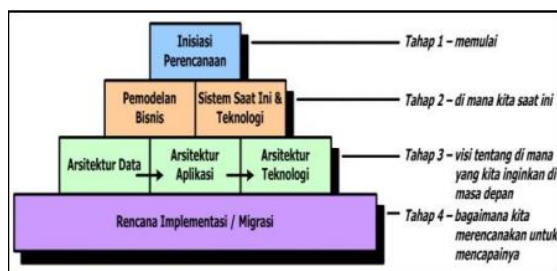
Figure 1. Enterprise Architecture Planning Components and layers

The following is an explanation of the stages in Enterprise Architecture planning:

1. **Stage 1, Beginning**
   Planning Initiation

This stage consists of determining the methodology used, who is involved, and what tools will be used. The result of this stage is a work plan for Enterprise Architecture planning and management's commitment to proceed to the next six stages.

2. **Stage 2, Understanding the Current Condition**
   Business model
   At this stage there are two stages:
   a. **Business Process Modeling**
      This stage aims to build a knowledge base about the business and information used by the enterprise today. This stage is a process for defining the business in order to provide a consistent, comprehensive and complete model of the enterprise business so that it can be used to define architectures and implementation plans. Business modeling is done by identifying and defining key business areas using a value chain model to highlight activities within the business. At this stage, a matrix of relations between functions and organizational units is also made in order to determine the responsibilities of each organizational unit for a business function.
   b. **Current system and technology**
      This stage aims to define and document the application systems and technology platforms used by the enterprise to support current business functions because enterprises which have been running in general already have systems and technology for their information system applications [23].

3. **Stage 3, Future Plan**
   Data Architecture
   There are three stages:
   a. **Data Architecture**
      This stage aims to identify and define the types and data entities needed for the enterprise to support the business functions which have been defined in the business modeling stage and then relate these data entities to the enterprise business functions.

b. **Application Architecture**

This stage aims to identify and define the main types of applications needed to manage data and support enterprise functions.

c. **Technology Architecture**

This stage aims to identify and define the technology principles needed to provide an application-enabled environment on pre-arranged application architecture to manage data and support business functions.

4. **Stage 4, Achievement Strategy**

Implementation/ Migration Plan

This stage defines the sequence for implementing the application, the schedule for implementation, cost/benefit analysis, and proposes a path for emigration from the current state to the desired state [23].

IV. DISCUSSION

4.1. Running Architectural Design

System design is a complete blueprint, as a guideline for programmers in making applications. [24]. The design used is Flowchart, use case, and class diagram.

a. **Flowchart**

A flowchart is a picture or chart which shows the sequence and relationship between processes and their instructions. The following is a flowchart of the system flow which runs in the administration and registration system at Mutazam Vocational School in Gisting.
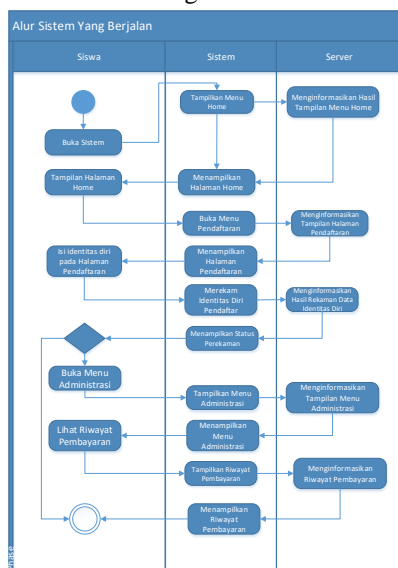
Figure 2. The application flowchart of Multazam Vocational High School

The flowchart of the administrative registration system flowchart describes the registration and administration process of Multazam Vocational School students. Every student of Multazam Vocational School will be able to access the system where the system is used to view the history of payment administration and borrowing of library books.

Figure 3. Architectural Design of Library Administration

The financial administration system and library functioned to control the administration of student payments and student learning activities at Multazam Vocational High School.

4.2. Proposed Architectural Design

a. **Uses Case Diagram**

A use case diagram is a sequence or steps which are related by actions (scenarios), either automatically or manually. The use case is depicted in the form of an ellipse/oval. The following is a use case diagram which shows the activities performed by the user on the system.
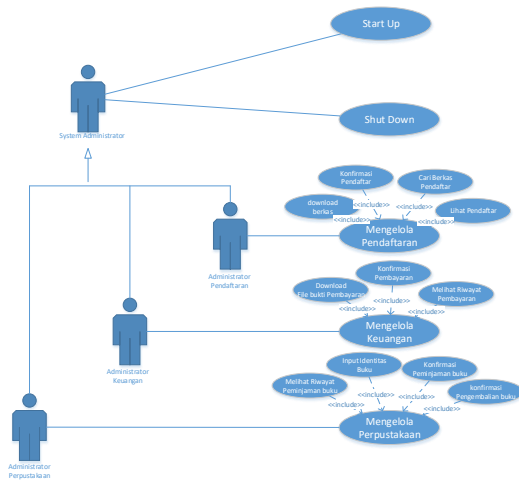
Figure 4.1.2. Use Case Diagram application of Multazam Vocational School

b. Class Diagram

From the several classes generated by the use case diagram, they will then be related into the class diagram, so that the relationship between each component will be known. The next step is to design a class diagram which includes:
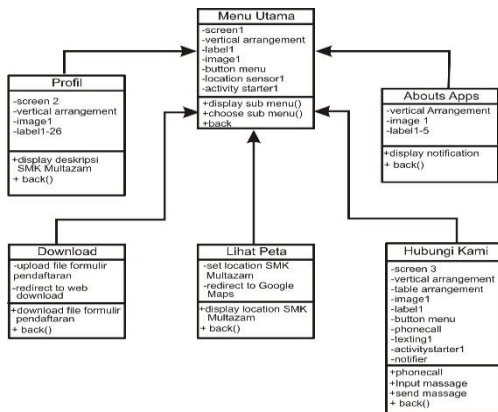

Figure 4. Class Diagram application of Multazam Vocational School

4.3. Technology Architecture Prototype
a. Main menu page

This page is the initial view of the Multazam Vocational School application which contains a selection menu. Every time you enter this application, this initial menu will appear.

Figure 5. Main Menu Page

b. Profile Page

This menu is a Profile of Multazam Vocational School which consists of a brief history, vision, mission, goals of Multazam Vocational School in Gisting.

Figure 6. Profile Page

c. Download Page

This menu is a page for downloading the registration form of Multazam Vocational High School. When you select the menu, you will automatically be directed to a download site which contains the form file which is ready for us to download.

d. Map Viewing Page

This menu allows the user to know the exact location of the Multazam Vocational School. Like the download menu earlier, if we select the view map menu, we will be automatically directed to google maps.

Figure 7. Map Viewing Page

In this menu, we can call or send a short message to the school's phone number to get more information.
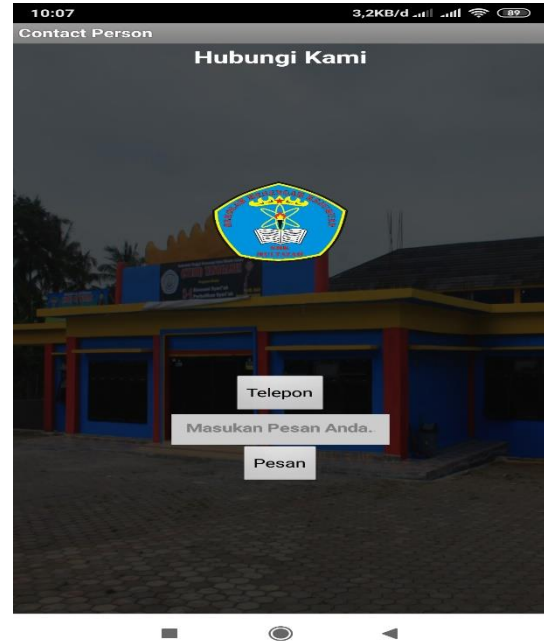

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Figure 8. Contact Us Page

e. Contact Us Page

4.4. Research Results Analysis

Analysis of research results is an application which is very helpful for administrators of each school unit to manage data and information at Multazam Vocational School.

STRENGH
characteristics of organizations or projects that provide advantages / advantages compared to others

WEAKNES
characteristics related to weaknesses in the organization or project compared to others

OPPORTUNITIE
opportunities that can be utilized for organizations or projects to develop in the future

THREATS
threats that will be faced by organizations or projects that can hinder their development

Figure 9. Analysis of research results SWOT Model

factors affecting the SWOT analysis

Internal

-resources owned

-the existence of a good internet network

-financial or financial support

External

-trend

-culture

-government units

-tech camping

-environment

SWOT on the system

Internal

-make it easier to manage schools

-make it easier for superiors to monitor each unit of the school section

-currently the intiative management of school management is done manually

-by using the system can provide time efficiency

External

-data can be consumed/viewed by anyone
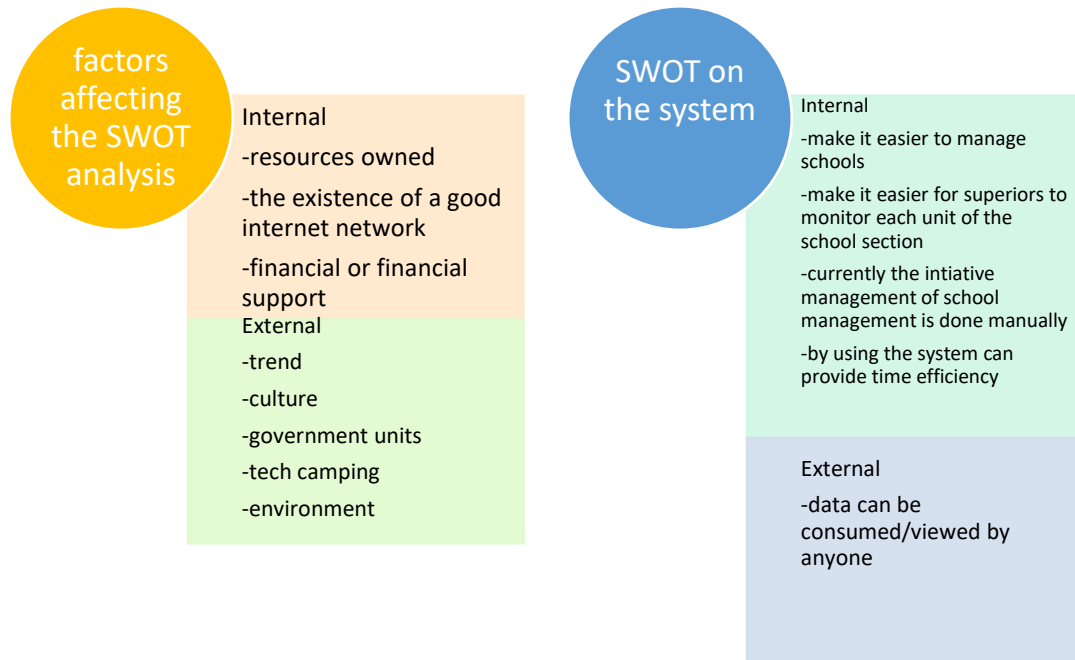
Figure 10. Factors that influence SWOT analysis on system implementation

Strength

Strengths are resources, skills or other advantages relative to competitors and inter-school needs. The strengths possessed by the Multazam Vocational School include:

a) Availability of personnel resources
b) The quality of school services
c) The infrastructure which is quite complete
d) School Financing which is affordable by the community

Weaknesses

Weaknesses are the limitations of the shortcomings which are owned by the Multazam Vocational School, such as skills and abilities which seriously hinder effective performance in school management at Multazam Vocational School:

a) Enter data which is still manually such as Registration, Payment Information, library
b) Errors in recapitulating student data, teacher data, school fee administration
c) The school promotion area which is not wide enough

Opportunity

Opportunity is the main favorable situation or trend in the Multazam Vocational School environment, including:

a) There is good service
b) In recapitulating the data in more detail
c) Promotion expanded
d) Addition of manpower in the School Administration

Threat

Threats are a major unfavorable trend within the Multazam Vocational School, such as:

a) There is competition for new schools which have the same vocational
b) There is no special server financing for data integration needed by the school
c) Internet network that is still slow

V. CONCLUSION

Based on the research conducted, it can be concluded that Strengths, Weaknesses, Opportunities, Treats (SWOT) and Enterprise Architecture Planning are the basis for building an Information System for Multazam Vocational School in Gisting based on the Android operating system which is used to provide information and become a service center for this school. Strengths are the form of the availability of personnel resources, the existence of good school services, infrastructure, affordable financing. Weaknesses are corrected by analysis in solving problems at Multazam Vocational School with the application of a digital website-based information system to serve Registration, Promotion, Libraries and other resources for the benefit of improving Service Quality at Multazam Vocational School. The existence of good service and the placement of human resources in accordance with their expertise

will increase the opportunities for improving the quality of service. Efforts to minimize the threat of promotion of other institutions, Multazam Vocational School collaborates with other institutions such as universities, and community groups to collaborate in service supervision, and involve the community to promote Multazam Vocational School in Gisting.

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