Academic Information System Architecture Planning at the Perjuangan University Tasikmalaya Using EAP

Yusuf Sumaryana[1], Aso Sudiarjo[1*]

[1]Universitas Perjuangan Tasikmalaya, Tasikmalaya, Indonesia
[2]Universitas Perjuangan Tasikmalaya, Tasikmalaya, Indonesia

*asosudiarjo@gmail.com

Abstract. The existence of Academic Information System is Not very helpful to the organization in carrying out its functions. However, systems that often solve problems, for example inaccurate student achievement index calculations. This causes the information obtained by students to be inappropriate. Because an information determines a useful information system or not. Information can be useful if the quality is good or bad. Quality information is determined by several factors, namely: Accuracy and validity, Improvement of information, Timely, Relevant [1]. Improved data and processes that must be completed require data processing tools so that it can become the expected information. This study makes the architecture of planning academic information systems at the University of Struggle Tasikmalaya with Enterprise Architecture Planning Method. The planning architecture using EAP is the answer to the solution to building a good information system.

1. Introduction

In carrying out its function as a professional organization, Perjuangan University is equipped with information technology devices. Academic Information System becomes very important. The benefits derived from it greatly help the running of organizational processes.

In carrying out the function of academic services, students are greatly helped by the existence of an academic information system. Today many universities use academic information systems in various forms and technologies. And of course this is expected to increase the competitiveness of higher education. As a new tertiary institution, the university of struggle in Tasikmalaya prioritizes the need for information technology devices.

The current academic information system certainly needs some adjustments. Because some of the features in it do not function properly and also the increasing need for facilities to process data. Some errors in the system are very likely due to weak enterprise architecture planning.

Organizations have difficulty in developing existing information systems because they are built or developed based on the needs of a particular unit. In other words, lack of planning.

From these problems a structured planning process is needed. Therefore the title raised in this research is: "Academic Information Systems Architecture Planning at the University of Perjuangan Tasikmalaya Using EAP".

Enterprise Architecture Planning (EAP) is a method used to build an information architecture. This method will be carried out the process of defining the architecture needed in an enterprise by using data or information that supports business processes and includes implementation plans [2].

Much research has been done relating to EAP. The first research conducted by A. Khumaidi (2016), used the EAP method for planning academic information systems at STMIK Pringsewu. Second,

research conducted by N. Zaidal (2016). Use the EAP method for architectural planning at the Institute of Business and Informatics..

Based on previous research, the model used to be built is the Enterprise Architecture Planning (EAP) model. The architectural model that will be built at the University of Struggle in Tasikmalaya is as follows:
1. Data architecture model
2. Application architecture model, and
3. Technological architecture model ...

The results of the preliminary above can be seen that the problems in this study are as follows:
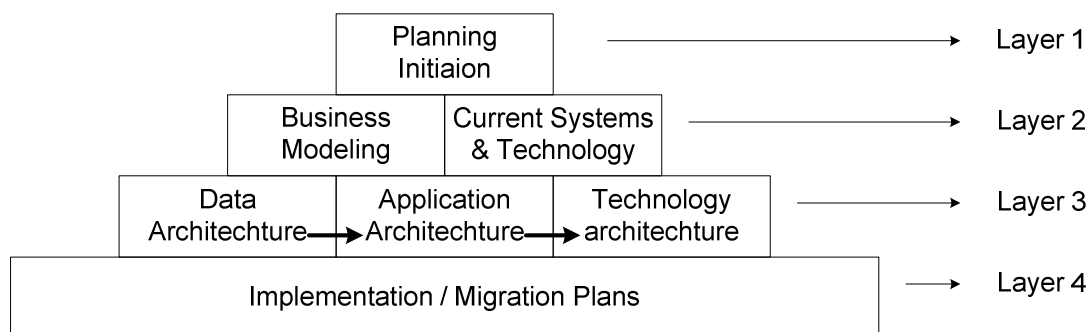1.   The existing information system technology at Tasikmalaya Struggle University is still a lot of its existence is incomplete and not optimal in its use, which will later support the vision, mission and goals of the institution.
2.   The absence of information systems and information technology planning in the implementation of Tridharma which is the main activity of the university.

From these problems, this research is limited to the proposed architecture of the academic information system planning of the university of Tasikmalaya struggle. So the formulation of the problem in this research is how to arrange the architecture of academic information system planning at the Perjuangan University, Tasikmalaya.
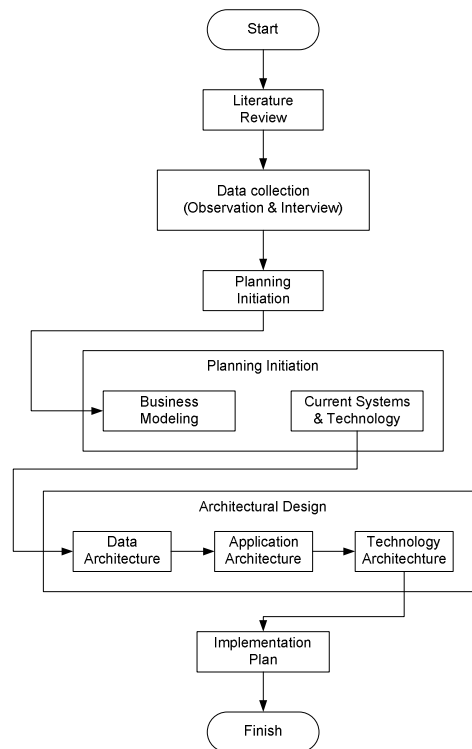
2. Research Method

The steps of this study refer to the Enterprise Architechture Planning (EAP) methodology as shown in Figure 2 [3].

The following are the EAP components in Figure 1 [2].

Figure 1. EAP components

Figure 2. Research Framework

3. Results and Discussion

This section contains the results of research discussion based on a research framework that refers to the EAP method

3.1. Requirements Analysis

Inputs and Outputs needed from each EAP stage are as shown in Table 1.

Table 1. Requirements for EAP Output Input

No	Stages	Input	Output
1	Planning Initiation	Collection of regulations, visions, missions and all things that are referred to in the university related to system development	Work plan, include: project scope, vision, mission and project team
2	Business Modeling	University Organizational Structure Chart and business process area data	Organizational Structure, value chain analysis, and business function decomposition results
3	Current system and technology	List of application systems and technology platforms that support at this time	Information Resource Catalog (IRC), SWOT analysis of enterprise conditions and problem identification.

No	Stages	Input	Output
4	Data Architecture	List of data entities	Conceptual data models that describe detailed data (candidate data entities, ER Diagrams, data entity matrices with business functions)
5	Application Architecture	List of applications currently used in Model	Conceptual applications that refer to conceptual data models (candidate applications, application matrices with business functions and application impact analysis)
6	Architectural Architecture	List of technologies used	The technology principles are consistent with data and application architecture, conceptual enterprise network models and conceptual business system architecture
7	Implementation Plan	Conceptual data models, applications and technology	The order of application development priority

3.2. Value Chain Analysis

The concept of value chain analysis described by Michael Porter can help in analyzing specific activities that can create value and competitive advantage for the organization. The value chain consists of two categories of activities, namely: primary activities and supporting activities [5].

3.3. Technology Platform Configuration

Current business locations for technology platforms refer to the Struggle University campus layout. Furthermore, it will be divided into zones. Zone is a space or place that contains work units. The following is a list of business locations in table 2.

Tabel 2. Bisnis location

Location Number	Conceptual Location Name	Explanation
1	Zone A	General administration and financial
2	Zone B	Chancellor's Room and Vice Chancellors
3	Zone C	Lecutrter Room
4	Zone D	Class Room

Tabel 3. List of aplication

No	Application Name	Description
1	New student admission application	This application is used to handle data on new student admissions. Generate student data reports for each study program

No	Application Name	Description
2	Course data processing application	This application is used to handle course data for all study programs. Generate course data reports.
3	Lecturer data processing application	This application is used to handle lecturer data for all study programs. Generate lecturer data reports.
4	Student data processing application	This application is used to handle student data for all study programs. Generate student data reports.
5	Study plan card (krs) processing application	This application is used to handle data krs each student for all study programs. Generate course contract data reports.
6	Student grade processing application	This application is used to handle grades data for all study programs. Generate report data values.
7	Student Grade Point Average (GPA) processing application	This application is used to handle data on the GPA of all study programs. Generate GPA data reports.

3.4. Data Arsitechture

Build and define data needed by organizations in order to support business functions. it is also the first step in building an information system architecture, because the quality of data greatly influences the function of the information system. [6]

3.5. Apllication Arsitechture

Application architecture aims to determine the main applications needed to support the business functions of the organization. This is the definition of an application to manage data and provide information to those who design business functions. [6]

3.6. Technology Arsitechture

The purpose of this stage is to identify the technological requirements, both hardware and software required by the business environment. From the results of defining the technology platform created, the network technology client / server model will be used.

3.7. Implementation Plan

At this stage the priority order of application development is made.

3.8. Success Factor Implementation

Successful factors implementation that must be considered to ensure successful implementation of an appropriate enterprise architecture can be in the form of variables that influence management in achieving goals for current and future activities. The successful factors of implementation include:

1. Management involvement, support and commitment.
   University Leaders must implement official decisions for the successful implementation of EAP at the University of Struggle and provide strict sanctions for those who do not comply.
2. Determination of special function units appointed to be responsible for implementation.
   Having a Data and Information Center unit or the like as an information resource center that needs to be given full responsibility and authority for the implementation of the EAP.
3. The quality of available human resources who are competent with information technology.
   Related units need to ensure the availability of quality human resources in the implementation of enterprise architecture.
4. The implementation of special training on EAP both technically and conceptually.

Generally the application requires new skills or other skills both technically and managerially, so periodic training needs to be held.

5. The ability to evaluate the need for new technology.

   The Study Program or other units must evaluate the existing technology platform to support and manage the application of the data architecture and application architecture whether the provision of new technology is needed to support the application of the architecture.

6. Good managerial and leadership skills.

   EAP implementation requires a view of the development of information systems that are planned. For this reason, a leadership / managerial role is needed within the University of Struggle with this perspective.

4. Conclusion

Enterprise Architecture Planning is a modern approach to planning for data quality and achieving the SI mission and processes undertaken to define a number of architectures in using information to support business and plans to implement the architecture [7].

Implementation of enterprise architecture is done to produce an information system where the EAP approach suggests that the application sequence is carried out using an application matrix with data entities [8].

References

[1]   Hutapea, Orin Ester. (2013) AUDIT SISTEM INFORMASI MENGGUNAKAN FRAMEWORK COBIT PADA DOMAIN DS DELIVERY AND SUPPORT) STUDI KASUS : PENGADILAN NEGERI SURAKARTA. Thesis.

[2]   Spewak, S. H., Hill, S. . (1992). Enterprise Architecture Planning. *John Wiley & Sons, Inc.*, *VIII*(1), 47–59.

[3]   Khumaidi, A., Suryana, A., & Ridhawati, E. (2016). Pada Stmik Pringsewu Dengan Menggunakan Metodologi Enterprise Architecture Planning (Eap). *Seminar Nasional Teknologi Informasi Dan Multi Media*, *3*, 6–7.

[4]   Zaidal, N., & Triloka, J. (2016). PEMODELAN ARSITEKTUR ENTERPRISE MENGGUNAKAN ENTERPRISE ARCHITECTURE PLANNING UNTUK MENDUKUNG SISTEM INFORMASI AKADEMIK DI JURUSAN TEKNIK INFORMATIKA STMIK DARMAJAYA BANDAR LAMPUNG. *Jurnal Informatika*, *8*(1), 10–23.

[5]   Subagjo, R. T. (2012). Pemodelan Arsitektur Enterprise STMIK CIC Cirebon Menggunakan Enterprise Architecture Planning. *Jurnal Sistem Informasi*, *7*(2).

[6]   Astri, L. Y., & Gaol, F. L. (2013). INFORMATION SYSTEM STRATEGIC PLANNING WITH ENTERPRISE ARCHITECTURE PLANNING. *CommIT (Communication and Information Technology) Journal*, *7*(1), 23. https://doi.org/10.21512/commit.v7i1.580

[7]   Sri Agustina Rumapea; Kridanto Surendro. (2007). Perencanaan Arsitektur Enterprise Penyelenggaraan Pelayanan Terpadu Satu Pintu (Usulan Dinas Perizinan). *Seminar Nasional Aplikasi Teknologi Informasi 2007 (SNATI, 2007*(Yogyakarta), 29.

[8]   PEMANFAATAN ENTERPRISE ARCHITECTURE PLANNING UNTUK PERENCANAAN STRATEGIS SISTEM INFORMASI. (2007). *Jurnal Informatika*, *8*(1), 9–9. https://doi.org/10.9744/informatika.8.1.pp.1-9