

Implementation of Enterprise Architecture Planning For Designing Inventory Information Systems

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Abstract

This study aims to design an inventory information system that consists of inventory data processing, facilitate the search for inventory data, and make the data into computerized and systematic. The research method uses enterprise architecture planning method consisting of data architecture, application architecture, technology architecture, and implementation. This research produces business modeling, list of data entities, databases, entity relations, network architecture and interface design that will be used to create inventory information systems at Universitas Bina Darma.

Keywords: System, Information, Inventory, Architecture, and Enterprise

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1. INTRODUCTION

The development of informatics technology that is accompanied by the development of science is very rapidly drove and affects the processing of data that impact on information generated. By utilizing computer technology, then an organization will issue a perfect information. Utilization of information technology has now been utilized in all fields, including in the field of education.

In carrying out its daily activities, a company engaged in education for its academic activities run well requires tools and supporting goods, such as computers, printers, tables, chairs, cabinets, ac, and many others. Therefore, the necessary arrangements in the procurement activities of goods or inventory required by collecting data inventory of any items that have been owned so as to produce an effective and efficient information system and administration becomes more orderly.

According to [1] inventory is the recording or registration of goods belonging to an agency into an inventory list of goods in an orderly and orderly manner in accordance with applicable provisions and procedures, whereas what is meant by the inventory of an institution are all state goods (controlled by an institution) whether held / purchased through funds from the government, or obtained as exchanges, gifts or grants as well as the proceeds of self-making at an institution for [2].

Currently the management of inventory data of goods that occur is usually still done by submitting the goods desired by sub-unit work units to the procurement of goods in the form of a letter of submission or filling form submission of goods. By procurement, letter or form submission of the unit is stated in Microsoft Office Excel application, then the letter of submission is continued to the leadership. After getting approval from the leadership, then submission letter is forwarded to the finance. The procurement section then makes the order and purchase of goods submitted by the unit. Then to make a report inventory data inventory, the procurement department has not utilized the computerized system optimally. During this time, the presentation of goods inventory reports only limited typing using Microsoft Office Word and Excel applications that have been prepared previously. So when the leader wants the inventory report of the goods, the procurement section takes a long time and the report are produced incomplete. Seeing from these conditions, of course makes the job more complicated and inefficient.

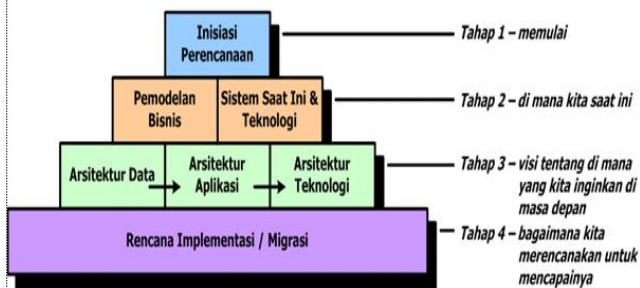
In the face of such problems, need to build an information system that manages web-based inventory data goods. The Web according to [3] is an interconnected system that contains various information, whether written, images, sound, video, and other multimedia information accessed using a software called a web browser. Therefore, it is necessary to implement a strategy that embeds mission in information system and its fulfillment which requires

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alignment of direction in planning, execution and control which is in line with business strategy. Development of strategies for fulfilling the mission of information systems starts from planning that identifies the information needs and possibilities of technology utilization innovation for performance improvement. This planning can utilize Enterprise Architecture Planning methodology that generates data architecture, application architecture, technology architecture, and the direction of its implementation plan [4]. Enterprise Architecture Planning (EAP) is a method developed to build enterprise architecture by [5]. Stages of construction can be seen in figure 1 below.



Figures 1. Layer of Enterprise Architecture Planning

Seen in the picture above, that the first phase of the EAP is the stage to begin, then the stage of understanding the current state, the defining stage of the vision of the future, and the last stage to plan in achieving the vision of the future.

Implementation plan in the form of application development sequence and migration / acquisition of technological foundation is collaborated according to business aspect as main driver, organizational aspect for role determination for implementer resource implementation, information system environment and information technology aspect to bridge the condition of current system and that will be realized, as well as aspects of application development that link one stage of development to another.

The design of inventory information system with web-based EAP is useful to facilitate recording of goods located in each room head of study programs, deans, work units and rector, reduce the occurrence of human error during the process penginputan goods, facilitate the process of supervision by management thereby reducing the risk of loss of goods or others. In addition to simplify and accelerate the process of inventory and procurement of goods on the procurement of goods which will certainly produce more accurate, precise and faster report quality when needed.

2. METHOD

2.1. Method of Collecting Data

The method used in designing inventory information systems in this study is the method of needs analysis (need analysis). This method is done to determine the needs of

users of inventory information systems to be developed. Activities undertaken at this stage of needs analysis include:

1. Identify user requirements.
2. Conducting literature studies / literature to better master and understand the basics of theory and concepts that support research.
3. Observe the problems that occur in the object of research. The observation is done by several steps, among others:
 - a) Conduct observation and analyze the condition of the research object.
 - b) Conduct interviews using open questionnaires on some users such as head of study program, dean, and work unit.

2.2. Data Processing Method

The method used in designing the system in this research is Enterprise Architecture Planning method. This method is carried out to find out effective measures and efficient resource utilization. Activities undertaken at this stage include:

1. Data architecture planning

Data architecture planning consists of a list of data entities, entity relationship diagrams and process matrices. The data entity list stage identifies existing entities in the enterprise linkup. Stage diagram entity relationships using Entity Relationship Diagram (ERD), while the process matrix stage includes the creation, processing, and use of data for the purpose of fulfilling the purpose of business functions. This relationship is defined through the process matrix of the data entity. Each cell in the matrix is filled with the letters: "C" (create), U (update), and / or R (reference).

2. Application architecture planning

Application architecture planning consists of a list of application candidates, application selection and impact analysis. The application candidate list stage is performed after the business function is defined and the data architecture is created, then the business drives and data drives are directed to define and define the application. Application candidates can be obtained by reviewing the Resource Catalog and accommodating the various inputs of the actual needs of the organizational unit or by adapting the development of information systems applications. Application selection stage can be done by using process matrix, while the impact analysis phase is performed on legacy systems. The results of the analysis in the determination of the choice still use, modify, or replace the legacy system.

3. Technology architecture planning

Technology architecture planning is to define what is needed for planning so that data and information system needs can be realized and enhanced its infrastructure. Technological support required is to connect one organizational unit with another for the effectiveness of the implementation of business functions as well as supporting the provision and storage of data. Aspects of business location and data distribution are important to determine the level of tech support.

4. Implementation plan

The implementation plan consists of sequencing of application development and migration / acquisition of technological foundation elaborated according to business aspect as main driver, organizational aspect for role determination for implementer resource implementation, environmental aspect of information system and information technology to bridge the condition of current system and that will realized.

The framework for enterprise architecture development uses a framework introduced by Zachman or called the Zachman Framework. The Zachman Framework is a tool developed to photograph the organization's architecture from various perspectives and aspects, so as to get a complete picture of the organization [5].

The steps in the Zachman framework include:

1. Planner perspective includes setting context, background, and purpose.
2. The owner's perspective involves establishing a conceptual model of the enterprise.
3. The designer's perspective involves establishing an information system model as well as bridging what the owner wants and what can be realized technically and physically.
4. The builder perspective includes defining the technical and physical designs used in overseeing the technical and physical implementation.
5. The subcontractor's perspective includes establishing roles and references for those responsible for conducting the construction of information systems.
6. Functional perspective includes representing user perspective and concrete form of implementation result.

3. RESULT

The data collected in this study includes the input data in the form of open questionnaires that have been filled by some users, among others, head of study program (kaprodi), dean, and head unit, other supporting data that

directly related to the research. Based on the questionnaire that has been spread then obtained information about data or user entities and situational analysis consisting of:

1. Users of information systems that will use them include the rectorate (vice rector II), deans, chiefs, head of the work unit and head of work unit.
2. The business process consists of the filing of inventory, inventory inventory filing, inventory process, inventory report.
3. Brand Image as a place of information technology and computer education in the city of Palembang.
4. Strategic location of Universitas Bina Darma located in the city center, adjacent to other universities such as Sriwijaya University, PGRI University of Palembang, Muhammadiyah University of Palembang and the central government of Palembang, Palembang mayor's office, DPRD, adjacent to the AMPERA bridge, Kuto Besak Fortress , MONPERA, Grand Mosque and other tourist attractions. There is plenty of transportation making it easy to go to Universitas Bina Darma.

From the identification of four users of this system, the business process of the procurement of facilities and infrastructure is the most important because in this section input, process and output inventory data in store. The model of administrative process of the procurement of facilities and infrastructure that have been studied previously by [6] can be seen in figure 2 below:



Figure 2. Process Administration Business and Process Infrastructure Model

Once a supportive business process has been identified, the next step is to identify and classify the data created, controlled, and used by the process. Furthermore, a matrix can be made in the design of information architecture with known data classes and business processes including the creation, processing, and usage of data for the purpose of fulfilling the purpose of business functions [7].

After each process and data are delineated, the process and data are mapped into the functional parts of Universitas Bina Darma, and will be responsible for using the system.

From this classification will produce an information architecture by identifying the interrelationship of each functional part and its interaction for each data between these sections. The main activities of an educational institution such as Universitas Bina Darma are administration, administration, institutional found in Kaprodi, Dean, and Unit. The support section is described as the process of formulating the relationship with the main entity's activities. Each process is associated with one or more data classes. For an overview of process and data

relationships, the matrix in table 1 has been created previously by [6]. Any data that has anything to do with the process must be controlled, when the data changes. After the process, their data and relationships have been identified; each process must map into the unit institutions as the system's future implementer. This is then to create a user interface (system user interface) system that connects between the business part with existing process processes.

Table 1. Overview of Process and Data Relationships Matrix

Data Process	Kepala Bagian Sarana dan Prasarana	Kepala Biro Administrasi	Dean	Kaprodi	Bagian Keuangan	Unit Kerja	Pimpinan
Pengajuan Inventaris	U / C	U / C	C	C	C	C	
Pendataan Pengajuan Inventaris	C	C					
Proses Inventaris	C	U			U		U
Laporan Inventaris	C						U

3.1 Application Architecture Planning

The next stage after the user identification, business modeling and process matrix, then followed by planning the application architecture needs functional include:

- Be able to collect inventory records from various work units.
- Able to manage inventory data.
- Can be shared by the user
- Confidentiality of inventory data is assured.

The next step after the specified functional requirements then made the principles of architecture include:

- Service Orientation: modular with standard open protocol for interoperability.
- Federated Data: distributed database.
- Federated Security: delegating user profile management to multiple authorities.
- Trustworthiness: the secrecy of inventory data is maintained from abuse.

3.2 List of Entity Candidates

The entity candidate is an entity that will be part of the enterprise architecture plan [8-9], so the determination is based on the business process described previously, thus the entity to be defined is a business entity and based on that business entity will be defined data entity. In

accordance with the conditions of the business process, the list of business entities that can be identified is as follows:

Table 2. List of Entity Candidates

Entitas Bisnis	Entitas Data
Entitas Operasional	1. Entitas Rektorat 2. Entitas Dekan 3. Entitas Kaprodi 4. Entitas Ketua Unit Kerja 5. Entitas Kepala Bagian Unit Kerja
Entitas Inventaris	6. Entitas Inventaris
Entitas Pengajuan Inventaris	7. Entitas Pengajuan Inventaris
Entitas Proses Pengajuan	8. Entitas Proses
Entitas Laporan	9. Entitas Laporan Bulanan 10. Entitas Laporan Semester 11. Entitas Laporan Tahunan

Once defined create a table of candidate list of entities then further define create a table of each entity data that has been created. The tables of each business entity are made as below:

Table 3. User

Field	Type Data	Keterangan
Username	Char	Nama Pengguna
Password	Char	Password Pengguna
Level	Integer	Level Pengguna: 1. Rektorat 2. Dekan 3. Kaprodi 4. Karo 5. Kabag

User table serves to store user data that will use this system consists of 3 (three) fields are username, password and level. In addition to functioning to store data, this table also serves as security before users use this system, only users who already have a username and password can use it.

Table 4. Inventory

Field	Type Data	Keterangan
kd_inventaris	Char	Kode Inventaris
nm_inventaris	Char	Nama Inventaris
tmpt_inventaris	Char	Tempat Inventaris
jmh_inventaris	Char	Jumlah Inventaris
ket	Char	Keterangan

The inventory table serves to store inventory data consisting of 5 (five) fields iekd_inventaris, nm_inventaris, tmpt_inventaris, jmh_inventaris and ket. In addition to functioning to store data, this table also serves as information to determine the location where an item is stored.

Table 5. Filing

Field	Type Data	Keterangan
kd_pengajuan	Char	Kode Pengajuan
nm_pengaju	Char	Nama Pengaju
kd_inventaris	Char	Kode Inventaris
tgl_pengajuan	Date	Tanggal Pengajuan

Tabel filing serves to store data inventory submission consists of 4 (four) fields namely kd_pengajuan, nm_pengaju, kd_inventaris and tgl_pengajuan. In addition to serving to store data submissions, this table also serves as information to know what units and what inventory filed.

Table 6. Process

Field	Type Data	Keterangan
tgl_pengajuan	Date	Tanggal Pengajuan
kd_pengajuan	Char	Kode Pengajuan
kd_inventaris	Char	Kode Inventaris
ket	Char	Keterangan

Tabel process serves to store data inventory submission process consists of 4 (four) fields namely tgl_pengajuan, kd_pengajuan, kd_inventaris and ket. In addition to functioning to store data submission process, this table also serves as information to know the process of submission, whether in the process of submission to the leadership or the process of purchasing inventory.

Table 7. Report

Field	Type Data	Keterangan
kd_laporan	Char	Kode Laporan
rtg_laporan	Date	Periode Laporan
kd_inventaris	Char	Kode Inventaris
kd_pengajuan	Char	Kode Pengajuan

Tabel report serves to store inventory report data consists of 4 (four) fields iekd_laporan, rtg_laporan, kd_inventaris and kd_pengajuan. In addition to functioning to store inventory report data, this table also serves as information to know how many submissions for a certain period such as weekly reports, monthly reports and annual reports and inventory information available.

a. Entity Relation

The next stage after creating a database of existing entities then described the relationship between entities, the depiction of this relation using the E-R diagram in which there is a derivative of conceptual relationships and their attributes by using schema diagram, as for the picture as below:

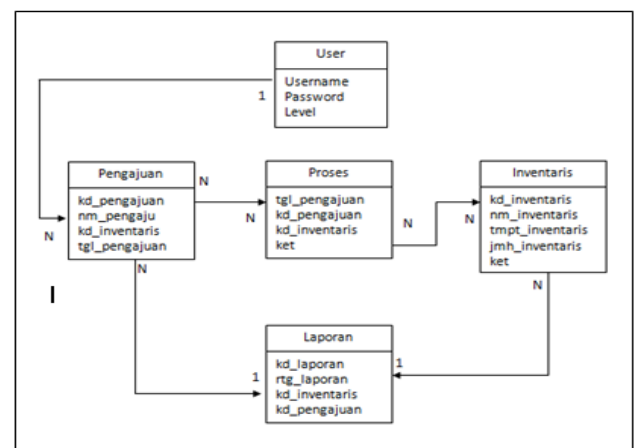


Figure 4. Entity Relation Diagram

b. Network Architecture

The next step after the entity relationship diagram is made is the description of the network architecture that describes the data communication relationships in each entity or business processes that have been described, as for the picture of the architecture of his finger as below:

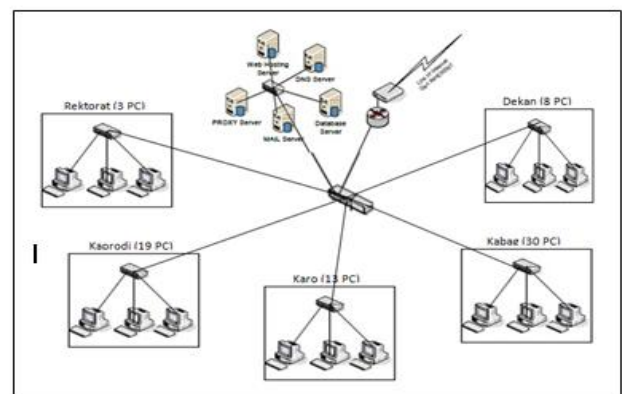


Figure 5. Network Architecture

c. Interface Design

The next stage of this research makes the interface design. The design of this interface describes the process flow of how the use of this information system and the appearance of the menus made consists of the design of the login form, main menu, inventory submission form, inventory process form and inventory report. Each menu and form has a useful button to execute the next process, for example on the login form that has 2 (two) fields or columns of content is username and password and there is 1 (one) submit button, this button works if the user has filled the username field and password. In addition, each menu and form has a number of different fields and buttons, in accordance with business processes and data entities that have been described previously

d. Main Menu Design

The main menu design has menus available for use by users. Menus available for the user include menu submission form, submission process, history of submission and change password. The design of the user main menu as shown below:

Figure 6. Main menu design

e. Submission Form Design

The design of the submission form menu used for users of this information system submits the goods, the required equipment or the submission of improvements from the existing inventory. The design of the submission form menu as shown below:

Figure 7. Submission Form Design

f. Main Menu Master Design

The main menu master design is used to monitor the submissions or inventory improvements of the proposing units. The main menu design of the leadership and menu submission process as shown below:

Figure 8. Main Menu Master Design

g. Report Menu Design

The report menu design is used to evaluate how many submissions or inventory improvements of units have been submitted. This report consists of a choice of weekly, monthly and yearly reports. The draft report menu as shown below:

Figure 9. Report Menu Design

After the leader choose report weekly period, monthly or annual then click ok button, so as to show detail from report which have in select, to print report click link print. The detail report design as shown below:

Figure 10. Detail Report Design

4. CONCLUSION

Here is the conclusion of this research:

- Planning an application architecture whose functional requirements include inventory records from various work units, capable of managing inventory data, can be shared by the user and the confidentiality of inventory data is assured.
- Generate interface design that will be used as a reference to create inventory information system.
- Next is to apply the results that have been achieved into the form of coding to be made into a program of information systems that can be used by users of the system.
- Once the information system is completed, it will be tested using the system through training activities with participants who become users of this system. And if the results of the training if the taste is still there is a shortage will be improved because the purpose of holding training to get advice from participants to improve this system to be better again and in accordance with the needs of the desired by the users.

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Biography

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