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Re-design Business Process at Forwading Company Based on Enterprise Architecture Planning

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***Abstract*—To be able to become a service company that is superior to other service companies, it requires assistance from the application of IS / IT in its business processes. Both main activities and supporting activities. Enterprise Architecture Planning or EAP helps make planning for the implementation of IS / IT more mature and better, so that the implementation of IS / IT in the company's business processes can run and work in accordance with the company's vision and mission. Therefore, this research is expected to be able to provide input to companies that are the object of research to implement IS / IT in accordance with business processes and vision and mission. Later the results of this study will be in the form of proposals for new business processes both supporting activities and the main activities of companies that use the application of IS / IT in them.**

***Index Terms*—Business Process, Enterprise Architecture Planning**

I. INTRODUCTION

Along with the development of the times, there is no doubt that information technology has also developed increasingly advanced. Every time there will always be technological developments that affect various aspects of life [1-3].

One of them is the aspect of the economy that has a positive impact on the company. Therefore, every company that aims to improve the effectiveness of its business processes and who wants to become a company that is far superior to other companies in a business competition, seeks to be able to implement information technology in its business [4-5]. Forwading company is one of them.

Forwading company is an Indonesian trucking company that is committed to high integrity to be able to provide transportation services to many areas in JABODETABEK, Semarang, Bali and Lombok. This company, which has been established for more than 35 years, has a lot of experience that has sharpened their professionalism in carrying out goods delivery activities to arrive safely and on time. At present, this company is only implementing a small part of IS / IT to support its business, so there are still several business processes that are done manually. Therefore, to be able to improve the business process of this company in order to be better, a strategic information system planning is needed for its business.

Strategic planning of information systems has the main objective, namely to prepare plans for the management of analysis, design and development of computer-based systems [6]. This plan, if done accurately, can support better business planning and development, and minimize problems that may occur in the implementation of the system [7-8]. In addition, planning must also be able to have harmony between IT and business, and consider the weaknesses and strengths of the company. This is intended so that the planning results can support the achievement of the company's vision and mission, and provide tangible results for the company [9].

One of the first steps to determine information system strategy planning is to understand the organization's business processes first. Understanding the organization's business processes can be done by doing business modeling. The purpose of business modeling is to provide a complete, broad and consistent knowledge base that can be used in defining the architecture and implementation plan. Business modeling in EAP (Enterprise Architecture Planning) can be done by defining the main function area using the value chain concept from Michael Porter. The value chain idea of Porter is a chain consisting of a series of activities that create and build a value that can produce an added value margin for the organization [6].

Thus, this study will discuss the design (planning) of enterprise architecture based on the stages of EAP.

II. LITERATURE REVIEW

A. Enterprise Architecture

Enterprise architecture is the fundamental organisation of an enterprise, described with its components and the relationships to each other and to

the environment. Enterprise architecture is a possible organizing structure of the business processes and IT infrastructure in an enterprise. The main idea behind enterprise architecture is the need to a primary enterprise logic in order to review, maintain and control the whole operation of the enterprise. Enterprise Architecture (EA) is a scientific discipline in IT that has the following meanings [10] :

- EA is an explanation of the plan for building one or a set of systems.
- EA is a logical, comprehensive, and holistic approach that is used to design and implement the system and its components simultaneously, which includes management of IS / IT infrastructure.
- EA can affect management and the area of organizational technology especially in the development of SI blueprints from various disciplines both theoretically and practically.

From these definitions, enterprise architecture can be used as a reference or guideline when developing information and communication systems because enterprise architecture is a blueprint.

III. Research Methodology

This study uses the following stages of research methods.

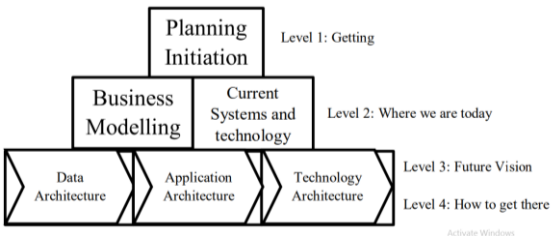

Fig. 1. Research Steps [12]

From Fig 1., it can be seen the stages of the research carried out which are in accordance with the planning stages of EA [13]:

- Planning Initiation, determining the place of case studies, studying previous research journals, and so on.
- Business Modeling, analyzing the company's business models currently using value chains and SWOT
- Current Systems and Technology, analyzes the system conditions and technology used in the company today.
- Data Architecture, observes and determines the data architecture that is suitable for the company.
- Application Architecture, determines the design of applications that are in accordance with the business processes running in the company.
- Technology Architecture, determine the design of technology that is suitable for the company.

IV. Results and Discussions

A. Planning Initiation

Forwading Company is a trucking company that commits to serve with high integrity for providing transportation service to many areas in JABODETABEK, Semarang, Surabaya, Bali, and Lombok. With more than 35 years of experience, we sharpen our expertise and experience to ensure that every delivery arrive safely and on time as promised. Many kinds of truck are ready for your transportation business needs, such as 2-axle trucks (fuso), 3-axle trucks (tronton), trailer, and semi- trailer. As part of your business transportation solution, we always guarantee the entire fleet of trucks in top condition in accordance with the prerequisite of safe and convenient transportation. This company has the following vision and mission:

- Be one of the trusted truck expedition providers that is reliable and professional in every service provided
- Prioritize on-time delivery truck service
- Keep and grow the synergic and cooperative relationship with new and existing consumers
- Keep the company's reputation by giving professional service in every business line
- Keep increasing the service quality and working professionalism of all the staffs and drivers
- Increase the integrated truck operational system's performance that relevance to the recent technology

B. Business Modelling

This section will show the current business model found in the company that was used as the case study. Can be seen in Fig 2.

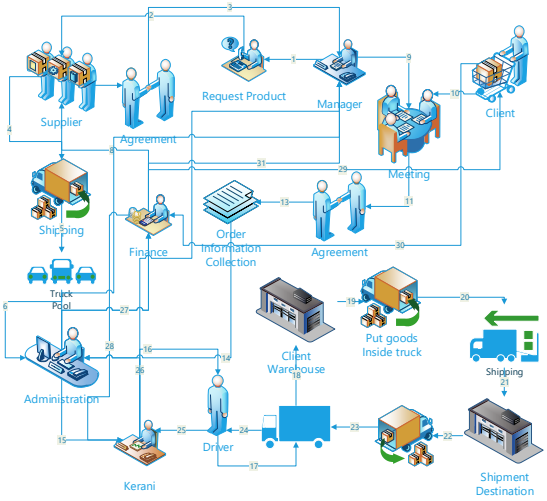

Fig. 2. Current Enterprise Business Model

From Fig 2. above it can be seen the form of business processes currently running in the company in general. From the overall business process, only six processes will be taken in this study, including:

- Marketing, the company will do marketing services it does to other companies. The marketing process is currently still using the usual way, namely, by 'door to door' where the party from the company will hold a meeting to discuss the services it has with prospective customers, in addition, the company will offer services via telephone or email.
- Order scheduling and supervision, for now, the order execution process is done manually. Scheduling the order is still done by sorting it manually by its employees. Also, oversight of order operations still often uses the telephone to communicate with truck drivers.
- Recording daily cash transactions, company cashiers are still recording manually using a notebook. Also, recording daily transactions are still delayed because of the company's cashier negligence.
- Payment of debt owned by the company, at present the payment schedule made by the company is still done by relying on human capabilities. Payment is made if the company remembers or has been invoiced by the debtor. Payment of debt installments (remaining debt) also has not been tracked automatically.
- Employee salaries, company leaders pay permanent employees by using a salary card or salary book as a reminder.
- Truck maintenance, currently the data collection of truck maintenance is still manually (using notebooks).

C. Current System and Technology

This section will explain the current systems and technologies found in companies using the value chain.This model divides business processes into two activities, namely the main and supporting activities. The results of the business mapping can be seen in Fig 3.

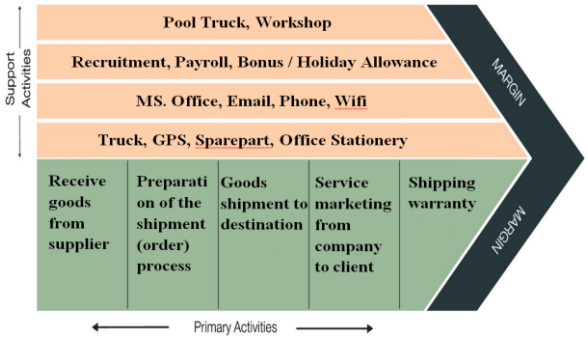

Fig. 3. Company's Value Chain [14]

From Fig 3., it can be seen if the existing business processes in the company can be explained as follows:

- The Inbound Logistics, company activities related to storage and receipt of goods obtained from suppliers.
- The Operation, the company's activities in arranging the shipping order scheduling, along with the maintenance of the trucks used.
- The Outbound Logistics, company activities related to the process of delivering goods to their destination.
- The Marketing and Sales, the company's activities in terms of marketing their business.
- The Services, services provided by the company to clients, so that they remain faithful in using company services.
- The Firm Infrastructure, infrastructure that supports the running of a company's business processes.
- The Human Resource Management, activities carried out by companies to manage their human resources.
- The Technology Development, all technologies used by companies, both software, and hardware, to help their business processes run.
- The Procurement, things or equipment needed to exist, to help the business process.

After knowing the main and supporting activities that are owned by the company, the next is the result of the SWOT analysis:

a) The Strength, the company has a pretty good reputation, has high expertise and experience in the shipping business, strong funding, the strategic location of the company, more than one branch of the company.
b) The Weaknesses, companies only use a little IS / IT in their business processes, most business processes are done manually, truck maintenance

is not organized, financial accounting is a bit sloppy.

c) The Opportunity, the company has a good relationship between clients and suppliers, suppliers provide cheap and high-quality spare parts prices, many goods transportation services are needed by many companies.

d) The Threat, there are delivery services from other companies, if they do not implement IS / IT in their business processes, they will be left behind.

D. Data Architecture

This section will explain the data architecture needed to support the running of business processes and applications that will be created later. Can be seen in Table I.

TABLE I. ENTITY CANDIDATE DATA

Business Entity	Data Entity
Marketing	General corporate data, contact us message data, website account data
Order Management	Order data, client data, driver data, data truck, account data
Daily Cash Controll	Cash in and out data, account data
Bill Payment	Payment installment data, important date data, account data
Payroll	Permanent employee data, employee performance data, salary data, account data.
Truck Maintenance	Data truck, truck damage data, truck repair data, account data.

E. Applicaton Architecture

Application Candidates

This section will mention the application candidates proposed to help with the business processes in this company. Can be seen in Table II.

TABLE II. APPLICATION CANDIDATES

Business Process	Application Code	Application Candidates
Marketing	App1	Company Profile Website
Order Management	App2	Order Application
Daily Cash Control	App3	Cash Day Application
Bill Payment	App4	Account Payable Application
Payroll	App5	Payroll Application
Truck Maintenance	App6	Truck Maintenance Application

Relationship of Candidates for Applications with Business Processes

From Table II, it can be seen if there will be six applications that will help run the proposed company's business processes. These six applications are adjusted based on the six processes that have been taken previously. The following is an explanation of the role of applications in company business processes:

- Company profile website, this application will help in the marketing process of company services. So companies don't have to do 'door to door' anymore. Prospective customers can easily find out the services offered by the company through this website.
- Order application, this application will assist in scheduling and monitoring the delivery of goods. So that the delivery schedule will automatically be arranged neatly and regularly, as well as provide clear information by whom the delivery of the goods is carried out and company expenses. In addition, this application can also facilitate the supervision of the delivery of goods via GPS installed on trucks and smartphone drivers.
- Daily cash application, this application will help in supervising and tidying up cash transaction data collection every day. In addition, this application will help to generate reports automatically. Managers can easily monitor the entry and exit of cash transactions.
- Account payable application, this application will help in recording the things that must be paid by the company and some other important events. This application can also provide an alarm to remind the company cashiers to pay debts owed by the company and can track installments made by the company.
- Payroll application, this application will help the permanent employee data collection along with payroll. Leaders can see the full profile of employees and add employee performance. This can help leaders in giving rewards or sanctions to permanent workers fairly.
- Truck maintenance application, this application will help in managing trucks owned by the company. This application will store truck data and generate reports on maintenance activities carried out on a truck and its costs.

Application Candidate Decomposition

This section will explain each of the features that the application candidate has. Here's the explanation:

- Company profile website
  - Post information about company (Input, Update, Delete, Print, View)
  - Contact Us (Input, Delete, Print, View)
- Order application
  - Client (Input, Update, Delete, Print, View)

- Order (Input, Update, Delete, Print, View)
- Truck (Input, Update, Delete, Print, View)
- Driver (Input, Update, Delete, Print, View)

- Cash day application
  - Cash (Input, Update, Delete, Print, View)
- Account payable application
  - Debt (Input, Update, Delete, Print, View)
  - Important Date (Input, Update, Delete, Print, View)
  - Collector (Input, Update, Delete, Print, View)
- Payroll application
  - Worker (Input, Update, Delete, Print, View)
  - Performance (Input, Update, Delete, Print, View)
  - Gaji (Input, Update, Delete, Print, View)
- Truck maintenance application
  - Truck (Input, Update, Delete, Print, View)
  - Error (Input, Update, Delete, Print, View)
  - Repair (Input, Update, Delete, Print, View)

Candidates for Applications based on Portfolios

This section will display the application candidates based on the application portfolio. can be seen in Table III.

TABLE III. CANDIDATES FOR APPLICATIONS ARE BASED ON PORTFOLIO

Strategic Cash day application, truck maintenance application, account payable application	**High Potential** Order application
Key Operational Company profile website	**Support** Payroll application

From Table III above, it can be seen if the application will be divided into four categories. The following is the explanation:

- Strategic, which is a critical application for the sustainability of business strategies in the future.
- Key operations, i.e. applications that are currently used or relied upon by the enterprise for success.
- High-oriented, applications that may be important in achieving success in the future.
- Supporting, a valuable but not critical application for success.

Applications contained in strategic and key operational categories will be implemented first. After that, only followed by applications that are categorized in high-oriented and supportive.

F. Technology Architecture

This section will display the results of the design of the technology proposed to be applied to the company, in order to support the course of the application that has been proposed previously. Can be seen in Fig 4. and Table IV.

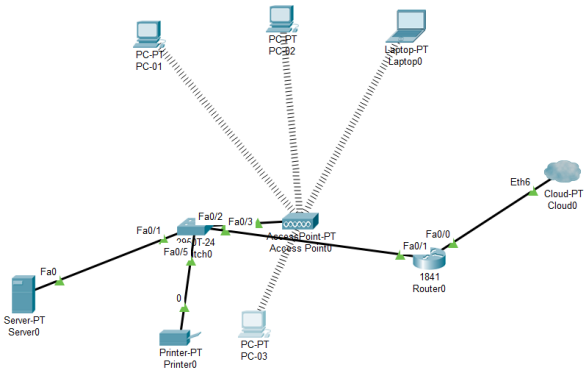

Fig. 4. Proposed Network Map

TABLE IV. PROPOSED TECHNOLOGY EQUIPMENT

Equipment Name	Specification
Mikrotikrouterboard	RB 750 G
Switch TP-LINK	SG108E
Network Cable	CAT 6E
Web Server	
- Processor	Intel Core I5 2.4 GHZ
- Motherboard	Q150
- Memory	16 GB
- Harddisk	1TB
- Lan Card	Gigabyte
Printer	EPSON LQ-310

G. Implementation / Migration Plans

This section will list the order of application implementation in the company. the order can be seen in Table V.

TABLE V. PLAN THE ORDER OF IMPLEMENTATION

Application	Information
Company profile website	New Development
Cash Day Application	New Development
Truck Maintenance	New Development
Account Payable	New Development
Payroll Application	New Development
Order Application	New Development

V. CONCLUSION

From the research that has been done, it can be concluded if the Enterprise Architecture Planning can be used to help plan the development of corporate architecture. In addition, based on the planning result, there are six new application designs that have been produced so that the planning of the information system that will be built can run well. These six applications represent the six parts of the business process discussed in this study, namely marketing, order management, daily cash management, bill

payment control, payroll, and truck management owned by the company. In implementing it, it is recommended that companies also conduct training so that their employees can follow changes in new business processes. It is also recommended to do research again using other methods and selecting the best enterprise architecture planning results.

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