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REDESIGN THE FORWARDING COMPANY'S BUSINESS PROCESSES USING THE ZACHMAN FRAMEWORK

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ABSTRACT

Forwarding Company is one of the companies in Indonesia that provides delivery services using trucks. To be a company that is far superior to its competitor, the company can implement Information Systems (IS) or Information Technology (IT) that is in line with the vision and mission of its business processes (both activities in the main business processes and activities in supporting business process). Enterprise Architecture Planning or EAP helps make planning for the application of IS / IT that is more mature and better so that implementing IS/IT in the company's business processes can run away and work in accordance with the company's vision and mission. To complement the design of new business processes using EAP, this study will use the Zachman framework adapted to EAP. This framework suggests a logical structure for categorizing, organizing, and describing a detailed picture of a company. Therefore, this research is expected to be able to provide input to companies that are research objectives to execute ARE/IT in conformation with business processes and its vision and mission. Later the results of this study will form a plan about new business processes, both the main and supporting activities that are in accordance with the company based on the Zachman framework.

Keywords: *EAP, Zachman Framework, Forwarding Company, Business Process*

1. INTRODUCTION

Forwarding Company is one company that is engaged in services, especially transportation service providers that transport goods from one place to another. The company's services cover the Greater Jakarta area, Semarang, Bali and Lombok. This company has also been established for 35 years, so this company has a lot of experience and expertise in the field of freight forwarding so that the goods transported can arrive on time and in a safe condition to their destination. As a company that has a vision and mission, this company certainly also has a strategy or business process that is carried out to be able to achieve the vision and mission.

Business processes determine what will be done, when, and how, which allows companies to achieve their strategic goals (vision and mission) [1]. Organizational business processes represent the work capabilities performed by all the resources involved in creating value results for clients and interested parties (suppliers, IT consultants, distributors, government policies, markets) [2]. Business processes contained in Forwarding Company is currently quite complex and less integrated and has not implemented SI / IT widely in it [3]. Companies like this must have a high level of struggle to get value from their IT infrastructure, align it with strategic objectives, and increase their company's superiority compared to competitors. All aspects of the company affect the effectiveness and efficiency of the application of IS / IT in its business processes. Thus, implementing enterprise architecture (EA) is expected to help companies overcome challenges related to the complexity or shortcomings they currently have [4].

Enterprise Architecture (EA) is a hierarchical method to describe how Information Communication Technology (ICT), Business Processes (BP), and staffs in overall organizational functions [5]. EA helps bring business and IT processes together by providing clear direction in managing output, software, and technology. EA

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provides a blueprint for defining organizational configuration and operations through these four sheets, business, data, applications, and technology [5], [6].

The IT blueprint basically contains the company's strategic plan in carry out and to builds IS in the company that is good and right on target. Inside there are guidelines for information system requirements such as what is needed and must be done by the company. This blueprint can be created using guidelines that function to model integration such as the Zachman Framework [7].

The Zachman framework is a corporate ontology that defines enterprise architecture as a collections of representative of elements, in which company integration will be carried out and a BP modeling approach to recognize the subordination relationships between people and IS that must be combined and contributed to achieve a fully integrated company (formal and structured to see and define companies) [8], [9]. In other words, the Zachman Framework aims to create an infrastructure that supports companies or organizations in the development, integration, design, management, and access to organizational IS [10]. The Zachman framework is a great modeling tool for building corporate architecture (EA) that can integrate and harmonize IT infrastructure and company objectives [9], [10].

Therefore, the researchers concluded to design enterprise architecture at organization using the Zachman Framework. This research is expected to produce an EA blueprint that can work in harmony with the vision and mission, as well as improve the smoothness of the business processes carried out at Forwarding Company.

2. LITERATURE REVIEW

2.1 Previous Research

Authors will discuss several previous studies relating to the paper conducted by the author. This is partly the result of previous studies relating to mapping the architecture of companies using the Zachman framework from international journals.

Based on an international journal entitled "Design Enterprise Architecture for Industry of Textile Using Zachman Framework" written by Jefry Leonardo, and J. F. Andry [11], the following conclusions can be drawn are as follows:

a) The EAP method can be used to plan the information system architecture of PT. SIU oriented to organizational needs consisting of data architecture, systems architecture and Information Technology architecture and implementation plans for architecture that have been made to help company and management activities to realize the mission of the company and to support business processes at PT. SIU, an information system is needed in which there are several applications, namely application inventory, production application, marketing application, financial application, human resource application, service application and In order for the ICT to be in accordance with the development of technology that is currently developing then proposed that applications to be built are based on network technology.

b) The difference with this paper is in the business process; previous research is manufacturing, and now is forwarding company.

c) The strength of this journal is that it focuses on implementation plan and new value chain.

d) The weakness of this journal is that it to help accelerate implementation, strong management commitment is needed and consistent and direct involvement.

Zachman Framework provides a complete method for how to mapping of data and implement plan an enterprise architecture and information technology [12].

2.2 Enterprise Architecture

Enterprise Architecture (EA) is a science in IT which has the following meanings [13]. EA is an explanation of the plan to develop one or a set of systems. It is a illustration of an organization from an integrated company and IT views or perspective [14]. It is a logical, published, and holistic discussion that is used to carry out the design and implementation of systems and their components together, which contains the management of IS / IT infrastructure [15]. It can affect the field of management technology and organization in the development of information systems blueprints from various disciplines both theoretically and practically. From these definitions, it can be concluded that enterprise architecture can be used as a reference or guideline when developing information and communication systems because enterprise architecture is a blueprint [16].

EA planning is a process in which multiple to-be architectures are developed to transform the present-day architecture to specific target architecture. It includes model a completely different architectural scenario that is tailored to the circumstances of the company [17].

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2.3 Zachman Framework

Zachman Framework was surveyed to be the most popular [18]. This framework suggests a logical structure for categorizing, organizing and describing a detailed illustration of a company. The main purpose of the Zachman framework is to develop an infrastructure that supports companies or organizations in the development, consolidation, design, management, and access to organizational ICT [19].

Zachman's framework interest to ICT in an organization or company and is usually described in six (6) rows and six (6) columns. Rows indicate perspectives, such as Planer (Scope), owner (Company Model), designer (Systematic Model), builder (Technology Model), Subcontractor (Detailed Representation), Actual System (Functioning Company) and columns representing six basic questions (6W = What, How, Where, Who, When, Why) in a perspective scenario [20], [21].

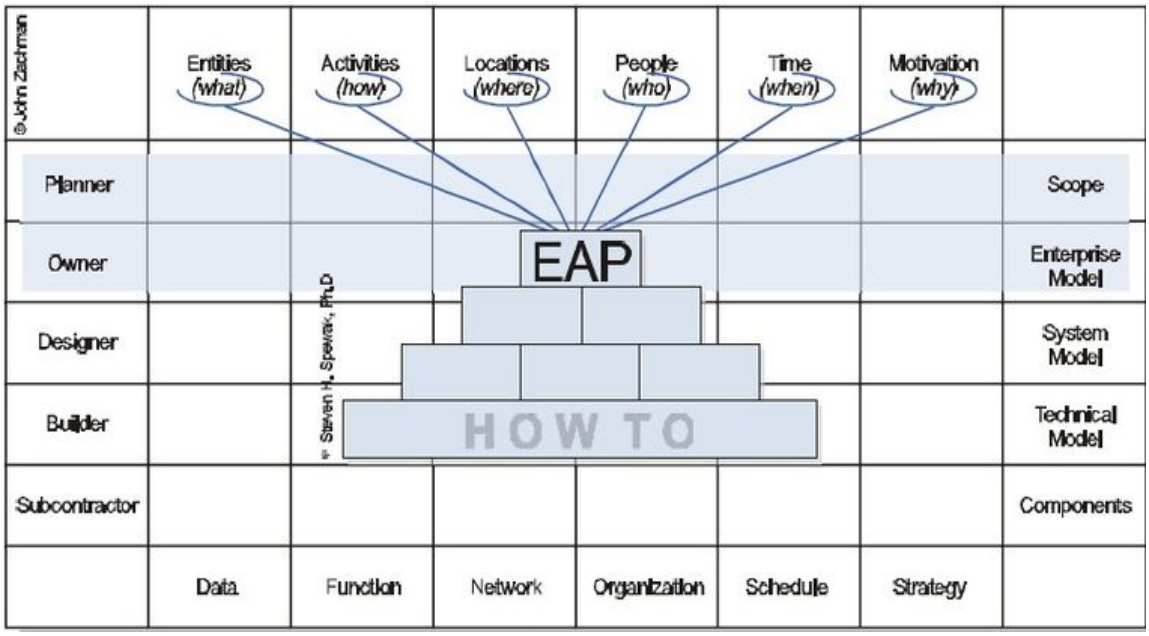

Figure 1 : Relations Between EAP and Zachman framework [23], [24], [25]

A well-defined architecture is very useful for recent developments in output processes and ICT systems to recognize important transformation. In this state, developers need tools or equipment to assist the development of IS/IT systems from architecture to implementation. Unified Modelling Language is an instrument that can assists in the constructions of the Zachman framework [22].

EAP is section of the Zachman Framework. In the Zachman Framework, EAP include first and second row of the first three columns as shown in Figure 1 Relations Between EAP and Zachman framework.

3. RESEARCH METHODOLOGY

This research was carried out through several stages such as those in Figure 2 Research Methodology. It can be seen if the research stage begins with planning initialization.

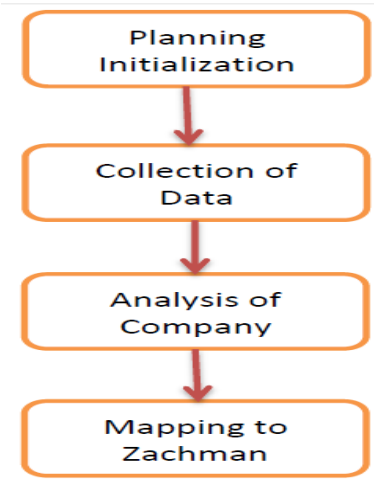

Figure 2 : Research Methodology

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Planning research preparation, at this stage will be carried out in a literature study related to research, determining the place of case studies, and so on related to the preparation of research implementation. Data collection, at this stage the researcher collected primary or secondary data from the company for use in research. This data collection is done by interviews with the company and direct observation. Interview and observation, need a long time, because of the bustle of the workers and management in the company.

Data collection methods used in this study is:

- Literature Study, this research uses materials that are closely related to research, which is derived from scientific journals, and other appropriate publication media to be used as a source of input for this research.
- Interviews, conducted with workers and management from forwarding company who understand and understand the business processes contained in the company.
- Observation, conducted at organizations. It aims to be capable to analyze the needs of information systems architecture design in the company. So the acquisition of primary data obtained from interviews with leaders and vice-leaders. Obtaining secondary data obtained from several company documents.
- Analysis of the company's current condition using the value chain and SWOT. This stage is carried out in an analysis of the present day condition of the company, starting from mapping the main business activities and supporting companies using the value chain, and proceeds with determining the SWOT of business processes.
- Mapping into the Zachman framework. This mapping will be adjusted to Zachman Framework's 6 row x 6 column matrix. Because this research did not reach the stage of system implementation.
- Analysis of the results of the study, the last will be analyzed the results of the overall findings of this study.

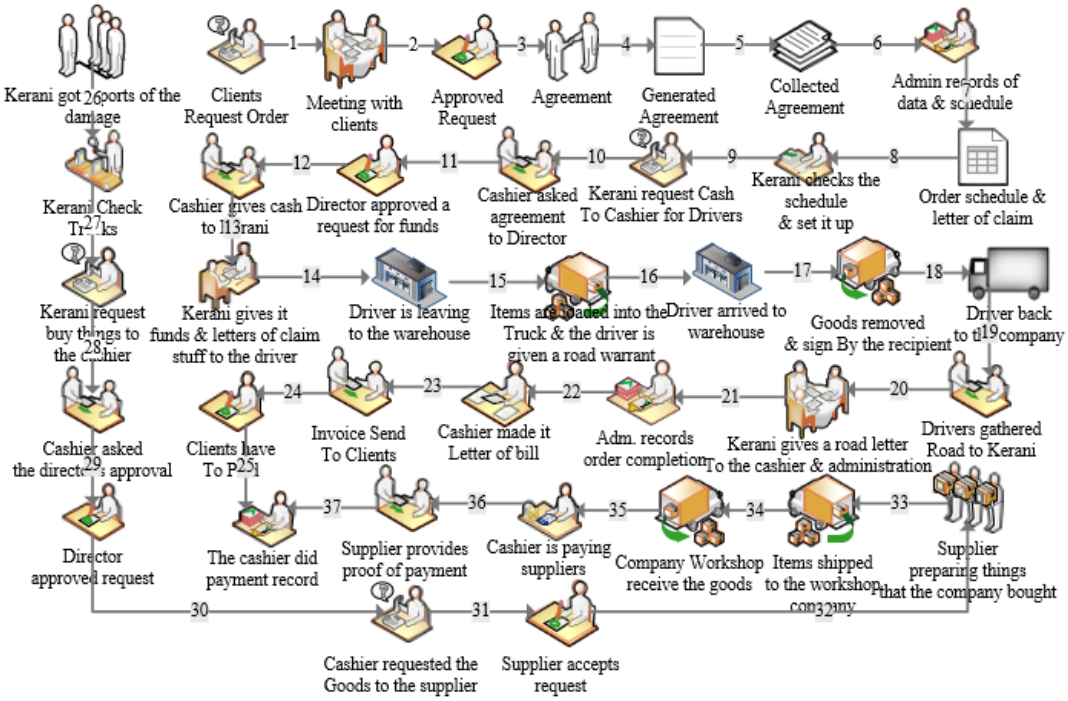

Figure 3 : Current Business Processes.

4. RESULT AND ANALYSIS

4.1 SWOT of Forwarding Company

4.1.1 Strength

- Has expertise and experience in the shipping business.
- Have strong funding.
- Have a pretty strategic place.
- Has more than one branch of the company

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4.1.2 Weakness

- Just use a little technology to help business processes.
- There are still many business processes that are done manually.
- Company payments are sometimes still manual; this can result in the use of company money by unauthorized workers.
- Maintenance of trucks has not been organized
- The truck has not been serviced periodically
- Bookkeeping data is not neat yet

4.1.3 Opportunity

- Have a good relationship with clients and suppliers.
- Many companies or customers who require freight services.
- Many suppliers provide quality truck and spare part prices
- There are many IT technologies that can support business processes

4.1.4 Threat

- If it does not keep up with the development of existing technology, it might not be able to survive or be out of the flow.
- Many other companies are engaged in transportation services.
- There is a substitution service for the transportation of goods

4.2 The Overview of Current Enterprise Conditions

At present, forwarding companies have the following forms of business processes, shown in Figure 3 Current business processes.

Base on Figure 3, it can be seen if this business process starts from activities carried out between managers or company leaders, namely the purchase of materials or equipment related to services provided by the company. If a purchase agreement has been made between the supplier and the company, the supplier will send the goods purchased by the company to the company's truck pool. The entry of goods will be recorded by the administration, and the record will be given to financing (cashier) so that the cashier pays to the supplier.

After all equipment for the implementation of company services is ready, the director conducts marketing of company services to the closest clients. This marketing can be done door to door or also through a system of connections and recommendations or trust. When a client wants to rent services from a company, a contract or employment agreement is made with the company. After the agreement is made, the administration will collect data and information related to the agreement. Like the order schedule, and so on.

The schedule that has been made by the administration will then be delegated to the clerk for the execution of the order. Kerani will arrange the driver to place an order according to his schedule.

In its implementation, the driver will go to the place where the client placed the goods. The driver will transport the goods and be delivered to the destination the client wants. And after that, the driver will receive a handover letter of goods and collect it to the clerk. Kerani will give it to the administration, and the administration will record and give the note to the cashier or finance to provide wages for the driver and also collect fees from the client. And then finance and administration will provide an order report to the manager.

Table 1: Job desk and Position Forwarding Company

No	Position	Job desk
1	Director	The main leadership of company. Leader the company. Decision maker.
2	Coordinator of Jakarta, Tangerang and Surabaya	Coordinate the course of business (trucking) at each company. Monitoring the performance of each employee underneath (operational, et al).
3	Admin Section	Operational workers who report their work to the manager. Take care of matters relating to the administration.
4	Finance section	Operational workers who report their work to the manager. Taking care of matters related to company
5	Kerani	Head of the drivers. Take care and manage the truck and its place. Arrange the drivers to deliver the goods according to the schedule.
6	Drivers	Make delivery according to the specified order schedule.

The organizational structure of the company is very simple, consisting of Director, Coordinator of Jakarta, Tangerang and Surabaya, Admin Section, Finance section, Kerani and Drivers. Job desk and position from staff and management from company can be seen in Table 1. Job desk and Position Forwarding Company.

4.3 Mapping Data to the Zachman Framework Matrix

After the data about the company's business processes have been collected then proceed to the

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process of mapping into the Zachman Framework matrix. The matrix used is only two rows and three columns of the Zachman framework, namely the planner and owner rows along with the what, how and where columns. Here are the results of the mapping:

4.3.1 Planner

What. Data relating to this information system include marketing (general company data, contact us message data), delivery of goods (client data, driver data, truck data), daily cash (transaction data in and out), payment of debt or installments (company debt or installment data, important event data), payroll (permanent employee data, employee performance data, payroll data), truck maintenance (truck information data, truck damage and repair data, truck repair costs), and account data.

How. The processes that occur include marketing (company introduction, service offerings, and question and answer with prospective customers), delivery of goods (recording client data, scheduling orders, monitoring order paths), daily cash (the process of recording cash in and out of cash per day), payment of debt or installments (recording information on debt or installments, recording important events, monitoring payments), payroll (recording employee data, recording employee performance, managing salaries), truck maintenance (truck data collection process, recording if damage or truck repair), and the reporting process.

Where. This line discusses the location of the main business location on Jl. Kopi No. 67 Roa Malaka, Tambora, West Jakarta 11230.

4.3.2 Owner

What. Here is Figure 4 about the use case diagram of the Forwarding Company that will be built: Based on Figure 4, it can be seen if there will be nine actors who will have a role or part in the information system that will be built. These actors include Super admin, web admin, permanent employees, leader, clients, cashier, administration, kerani, and managers. Each actor has their respective functions. The following is the explanation:

Super admin, plays the role of the party responsible for managing and monitoring the overall information system. This actor has the highest position in the information system because he has the freest access to every part of the information system to be built.

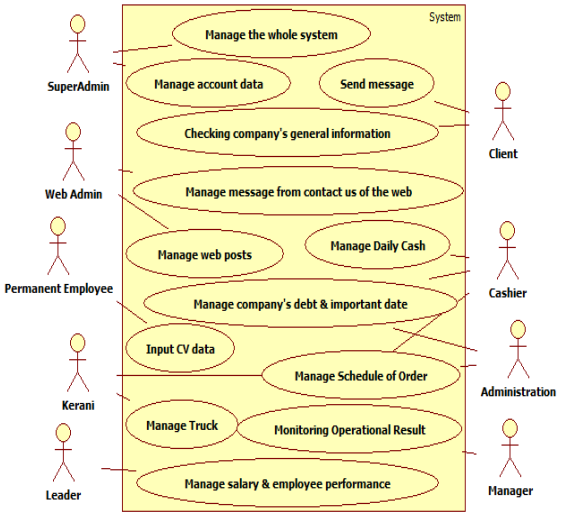

Figure 4 : Use Case Diagram of Forwarding Company

Web admin, plays the role of the party who will later operate an information system engaged in marketing, namely the company profile website. Admin will manage the contents of the website and take care of incoming messages from clients or website visitors.

Clients, or website visitors, can interact with the information system that will be built by checking access to the information contained on the website and can send messages to the company.

Leader, this type of actor will later be used by the company owner in managing payroll for his permanent employees.

Permanent employee, this type of actor will be owned by all permanent employees of the company. Playing a role in inputting information data such as curriculum vitae into the system, as well as being able to check the salary he gets.

Cashier, the type of actor that will be given to those who make arrangements in the field of cashiers or cash managers. The cashier will manage the daily cash transaction data management, as well as the management of debt or installment data that must be paid by the company.

Administration, the type of actor that will be given to the administration of the company. This party will play a role in inputting data orders and

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clients so that the goods can be scheduled for a regular delivery of the system.

Kerani, the type of actor that will be given to the chief driver. This actor will manage the driver data, truck, and assist in arranging the order schedule that has been made by the administration.

Manager, the type of actor that will be given to parties who are the right hand of the company owner or manager at the company. This party will supervise and monitor the results of the work or work processes carried out by other parties through the system.

How. Discussing the activities that can be bring out by each actor in the information system that will be created. The following is the explanation: Super admin can manage account data and the entire system. Leaders can input work performance data of each permanent employee that can give effect to the salary they will get. Permanent employee input data and can check the salary earned along with a little note about their work performance. The cashier manages data related to cash outflows per day, as well as managing the debt or installment data owned by the company in the system. Administration can input client data, order data, and data regarding important dates for the company.

The Kerani can arrange or manage the driver and truck data that will be used to carry out an order (helping to complete the delivery schedule), in addition, Kerani can also input the damage or repairs made to the truck.

The manager has the duty to supervise and monitor the process of shipping goods and various other work reports. Web admin can manage the company information contained in the website, as well as manage incoming messages from clients. Clients can access the company's website and can do question and answer by sending messages on the website.

Where. In this line discusses the location where the information system will be placed. Information systems will be in the local network (daily cash, freight forwarding, payroll, truck maintenance, debt payments) and public networks (company profile website). The following is shown Figure 5 current network map owned by the company today:

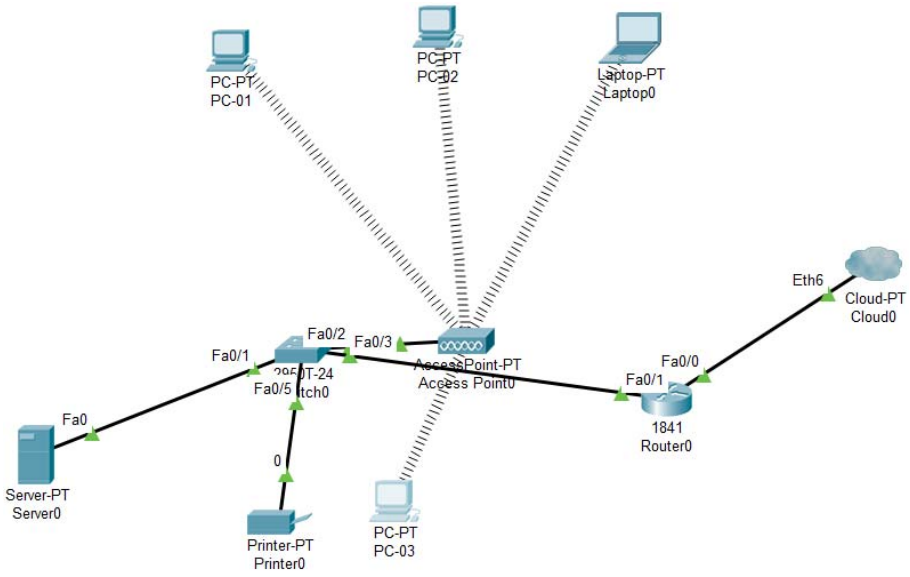

Figure 5 : Current Network Map.

Based on the Zachman Framework mapping results, it can be seen if the results of enterprise architecture planning are as follows, shown in Figure 6 Proposed Business Process.

From Figure 6, it can be seen if there will be six applications that will help run the proposed company's business processes. There are 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

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the services offered by the company through this website.

• Goods delivery 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.

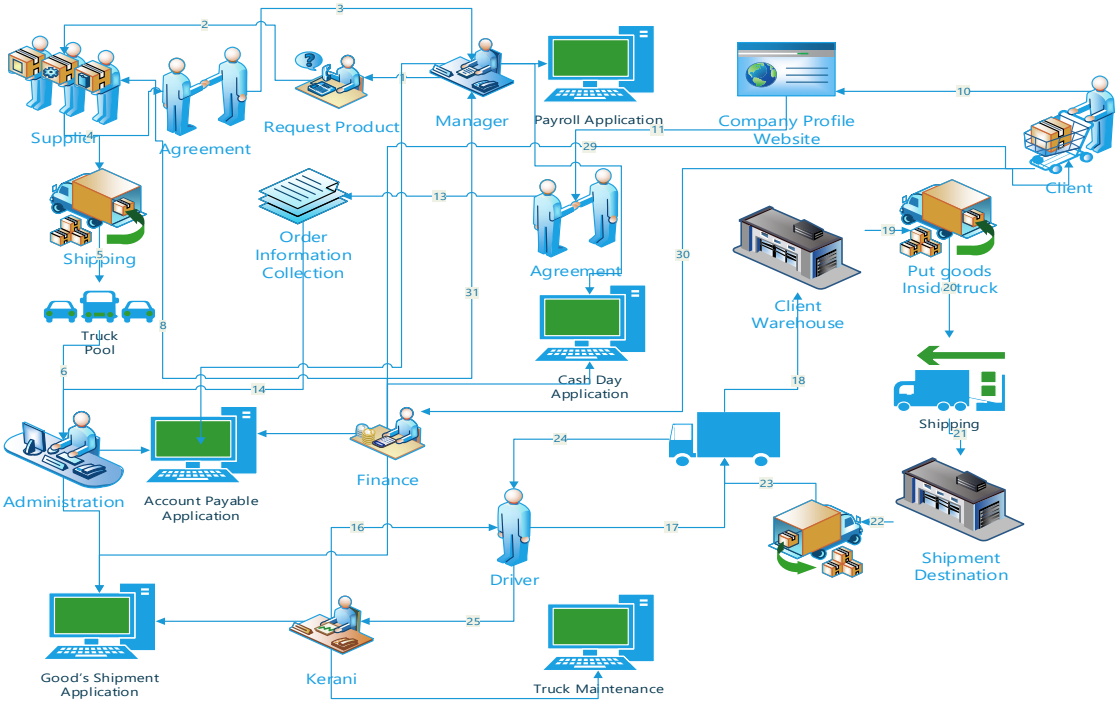

Figure 6 : Proposed Business Process.

4.4 Implementation Plan

From the results of business process planning for the company, there will be six applications that will be implemented in the company's business processes. Implementation of this application will be carried out in sequence based on the application portfolio as follows.

From Table 2 Portfolio Application, 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.

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

Table 2: Portfolio Application.

Category	Application
Strategic	Daily cash application, truck maintenance application, account payable application
Key operational	Company profile website
High-oriented	Goods delivery application
Support	Payroll application

This section will explain the comparison that exists between the company's current conditions with the conditions in which the company has implemented the proposed application. The following discussion: new organizational structure with IT/IS Division, can be seen in Table 3 New Job desk for IT/IS Division.

Table 3 : New Job desk for IT/IS Division

No	IT/IS Division	Job desk
1	CIO (Chief Information Officer)	Lead IT /IS the company. Establish strategies and vision and mission of the company.
3	IT strategy & planning	Strategic thinking and the best planning for the running of IS / IT in the company in accordance with the times
4	IT application & development	Manage applications related to businesses that exist in the company. Creating or developing applications for companies so that business processes run smoothly.
5	IT network & infrastructure	Manage and oversee the network that is built in the company. Manage and maintain IS / IT infrastructure. Maintain the security of the existing network at the company.
6	IT operation	Providing assistance or training for non-IT workers in using new applications. Helps input data into the application.

4.5 Proposed New Value Chain

Based on the results of the analysis of the company, there is changes in the value chain based on Zachman Framework are:

4.5.1. Main activities
- Inbound logistics

The activities contained in this section have not changed much from before. This activity is still ongoing to obtain goods or information from suppliers to support the company's main business processes.
- Operations

This activity has a slight change compared to before. If previously the storage or management of data information is still done manually, after using the application, the management of information or data related to the company's business processes will be done digitally.
- Outbound logistics

This activity also has a change when compared to the previous value chain. If previously a report related to a business process was made manually, then after using the application, the report will be automatically generated by the application. Besides the reports generated can also be automatically stored in a database, so companies do not need to be complicated to archive data in a particular place or storage space.
- Marketing and sales

The activities in this stage have a slight change when compared to the previous value chain. The difference here will be seen in the use of the proposed company profile website. If the company profile website has been implemented, marketing and question and answer with prospective clients/users can be done through the application.
- Services

The service offered by the company might be able to add services such as 24H online customer service on the company profile website, and so on.

4.5.2. Supporting activities
- Infrastructure firm

This section has additions when compared to the previous value chain. Where in the new value chain there will be a data server room and some other supporting infrastructure for IS / IT.
- Human resource management

This section has additions when compared to the previous value chain, which is the payroll process. Where after using the proposed payroll application, workers can see their own payroll report each period with details of deductions or additional salaries.
- Technology development

This section has changed when compared to the previous value chain. Where after using the proposed applications, of course, applications, networks, and other software/hardware related to SI / IT will be included in this section.
- Procurement

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This section has a slight change when compared to the previous value chain. Where when implementing SI / IT in the company, of course, the company also needs equipment that can support the running of IS / IT in the company, such as cable, internet connection, and others.

The interesting thing from the results obtained in this study is the proposed business process as shown in Figure 6 which consists of Portfolio Application, New Job desk for IT / IS Division and Proposed New Value Chain found in forwarding companies, and which distinguishes from previous research is an architectural technology design that consists of planning an Order and Roadmap for the Implementation.

5. CONCLUSION

From the research that has been done, it can be concluded if the Zachman framework can be used to help plan the development of corporate architecture. In addition, based on the EA planning carried out using the Zachman framework, 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, shipping, daily cash management, debt or mortgage 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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