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ANALYSIS AND DESIGN OF IT PROCUREMENT COMPANY ENTERPRISE ARCHITECTURE USING TOGAF ARCHITECTURE DEVELOPMENT METHOD (CASE STUDY: PT MITRA TELEMATIKA UTAMA)

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ABSTRAK

Proses bisnis dalam dunia bisnis menuntut perusahaan untuk dapat mengelola informasi dengan baik dan akan kebutuhan informasi masing-masing pihak yang berkepentingan dapat terpenuhi dengan cepat dan tepat. Pengembangan EA (Enterprise Architecture) di perushaan it merupakan pekerjaan rumit dan penuh tantangan. PT Mitra Telematika Utama mempunyai masalah pada kegiatan akuntansi dan kegiatan pembukuan. Perencanaan arsitektur sistem informasi organisasi merupakan proses yang kompleks, sehingga proses perencanaan harus dikelola dengan pedoman yang jelas yang bertujuan untuk menyelaraskan teknologi bisnis organisasi dan strategi publik untuk memciptakan hasil yang maksimum terhadap organisasi.. Merancang suatu model enterprise architecture membutuhkan sebuah kerangka kerja agar dapat mengelola sistem yang kompleks dan dapat menyelaraskan bisnis dengan teknologi informasi yang akan dikembangkan dalam organisasi. TOGAF merupakan suatu kerangka kerja yang dikembangkan oleh The Open Group dari 1995 sampai sekarang. TOGAF memberikan metode dan tools yang digunakan dalam merencanakan, menciptakan, merancang, serta mengelola pengembangan dan implementasi enterprise architecture. TOGAF memberikan metode yang detil tentang bagaimana membangun dan mengelola serta mengimplementasikan arsitektur enterprise dan sistem informasi yang disebut dengan ADM (Architecture Development Method), sehingga dalam merencanakan arsitektur enterprise, TOGAF ADM menghasilkan blueprint arsitektur aplikasi, arsitektur bisnis, arsitektur teknologi, arsitektur data, dan roadmap implementasi yang mana blueprint-blueprint tersebut berguna sebagai acuan pada saat mengembangkan sebuah arsitektur enterprise dalam hal ini pada PT. Mitra Telematika Utama.

***Kata Kunci**: Arsitektur Enterprise, ADM, TOGAF*

ABSTRACT

Business processes in the business world require companies to be able to manage information properly and the information needs of each interested party can be met quickly and accurately. The development of EA (Enterprise Architecture) in the company is a complex and challenging job. PT Mitra Telematika Utama has problems with accounting activities and bookkeeping activities. Planning the organizational information system architecture is a complex process, so the planning process must be managed with clear guidelines that aim to align the organization's business technology and public strategy to create maximum results for the organization. Designing an enterprise architecture model requires a framework to manage complex systems and align business with information technology that will be developed within the organization. TOGAF is a framework developed by The Open Group from 1995 to the present. TOGAF provides methods and tools used in planning, creating, designing, and managing the development and implementation of enterprise architecture. TOGAF provides a detailed method on how to build and manage and implement enterprise architecture and information systems called ADM (Architecture Development Method). TOGAF provides methods and tools used in planning, creating, designing, and managing the development and implementation of enterprise architecture. TOGAF provides a detailed method on how to build and manage and implement enterprise architecture and information systems called ADM (Architecture Development Method). TOGAF provides methods and tools used in planning, creating, designing, and managing the development and implementation of enterprise architecture. TOGAF provides a detailed method on how to build and manage and implement enterprise architecture and information systems called ADM (Architecture Development Method). So in planning the enterprise architecture, TOGAF ADM produces application architecture blueprints, business architectures, technology architectures, data architectures, and implementation roadmaps where these blueprints are useful as a reference when developing an enterprise architecture in this case at PT. Mitra Telematika Utama.

***Keywords**: architecture enterprise, TOGAF,ADM*

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I. INTRODUCTION

PT. Mitra Telematika Utama is a company engaged in trade, services, development, and industry that has been operating since 2012. In addition, the company still uses manual methods when conducting procurement activities. That is, using Microsoft Office applications for accounting activities and books for record management. As a result, IT procurement activities become inefficient, delaying data management related to IT procurement activities and disrupting the decision-making process. of the existing part of the company. This is because no information technology roadmap can identify application portfolios related to computerized information systems that are used to support companies in business process activities, especially the procurement process for information technology hardware and software.

Due to the existing problems, we need a way to reduce the constraints of PT. Mitra Telematika Utama. The TOGAF ADM framework is used as a way to design enterprise architectures because TOGAF ADM provides methods and tools for planning, designing, and managing the development and implementation of enterprise architectures. The TOGAF-ADM framework has complete phases and is structured systematically. This design can produce a blueprint for use in the development of information systems, especially in the IT procurement process, and provide a corporate architecture design that meets the vision and mission of PT. Mitra Telematika Utama.

In the research entitled "Integrated System Architecture Planning Using Togaf Adm (Case Study: Rosma Education Foundation)" written by Arif Maulana Yusuf and Budi Permana. In this study, there are problems, namely in facing future business challenges that are increasingly competitive, Yaperos has launched a business performance improvement program, which includes business process simplification, automation, and integration of business processes with the use of information technology. The current information system at Yaperos has no linkage between one part and another which has an impact on the foundation in carrying out its operational activities.[1]

The next research is entitled "School Information System Architecture Design with The Open Group Architecture Framework (Togaf) (Case Study: Ar-Rahmat Islamic Boarding School)" written by suhendri. In this study, there are several problems, namely manual data handling and processing, past data searches that take a long time, and the uncoordinated of each part involved in it. These things cause the value of school management performance not to be reached optimally. Therefore, an integrated information system is needed and can manage information about education administration quickly and precisely with the support of computer equipment. The output that can be achieved from the architectural design of the School Information System is to produce a model and a basic framework (blueprint) for developing an integrated school information system to support the needs of Islamic Boarding Schools.[2]

TOGAF was chosen because it focuses on the Architecture Development Method (ADM) life cycle and has the potential to be a more open, inclusive, and transparent source. The steps taken in this research start from preparation, management of business needs, design drawings, and building construction. The results of this study are business planning recommendations, including business plans, information systems plans, and transformation and migration opportunities, and contain documents such as pictures, diagrams, maps, examples, and text documents. Business requirements for information systems at PT. Mitra Telematika Utama. The results of this study are intended to guide the acquisition and development of information systems at PT. Mitra Telematika Utama can improve all the company's business activities, especially IT work at PT. Mitra Telematika Utama in the telecommunications sector to ultimately improve customer satisfaction in business services.

II. METHODOLOGY

A. Framework

To develop enterprise architecture in PT. Mitra Telematika Utama requires some levels of work aimed at the core structure of TOGAF-ADM. These steps are described in the flow chart, which is shown in the figure 1 below:

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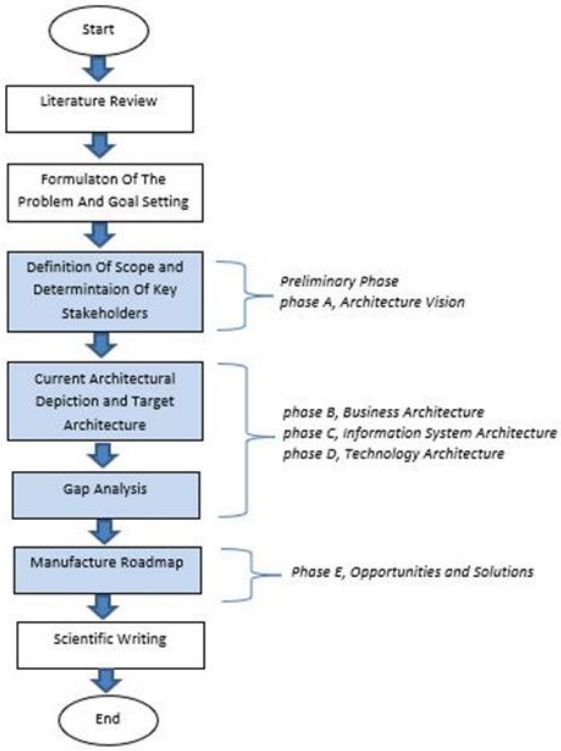

Fig. 1 Research Framework

B. Data Collection

Data is collected by direct observation or observing the container in question through many ways such as exploring aspirations, organizational forms, business activities and information technology procedures contained in the agency. Interview the parts of the organization that are continuous in the research. Conducting a review of the organization in question so that you can imagine what the object will be studied, clarifying the relationship of some variables, and testing hypotheses that are useful for confirming theory and making predictions.

C. TOGAF ADM

TOGAF consists of two main parts, namely the TOGAF Architecture Development Methods (ADM) and the TOGAF Foundation Architecture which are generic service and function architectures that provide a solid foundation on which more specific architectures and architectural components can be built. TOGAF ADM is the core of TOGAF. It is in itself a reliable and proven method for developing IT architectures that meet an organization's business needs, leveraging other elements of TOGAF, and other architectural assets available to the organization.[3]The last TOGAF version was TOGAF 9.1, launched on December 1, 2011. Evolutionary development of TOGAF 8, TOGAF 9 includes many new features including Rigidity improvements, and official Metamodel Content linking TOGAF artifacts together (although there are some issues with the Metamodel)

Elimination of unnecessary distinctions More examples and templates Additional guidelines and techniques include A formal business architecture-based approach. Planning-based business capabilities.[4]

Following are the stages of TOGAF ADM.

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Fig. 2 Togaf ADM

D. Enterprise Arsitektur

Enterprise architecture or better known as enterprise architecture is a description of the stakeholder mission which includes information, functionality/usability, organizational location, and performance parameters. Enterprise architecture describes a plan for developing a system or a set of integrated systems.[5]

Enterprise architecture is a logical, comprehensive, and holistic approach to designing and implementing systems and system components simultaneously.[6]

III. RESULT AND DISCUSSION

A. Preliminary Phase

This phase is the preparatory and initial phase to define the framework and principles aimed at confirming the commitment of stakeholders, determining the framework, and detailed methodology that will be used in the development of the enterprise architecture.[7] In determining the principles such as business architecture, application architecture, technology architecture, and also data architecture, the principles must be following the needs of PT. Mitra Telematika Utama.

1. Identification 5W+1H

   In determining the principles such as business architecture, application architecture, technology architecture, and also data architecture, the principles must be following the needs of PT. Mitra Telematika Utama.After determining the architectural principles in designing, then enter the stage of identifying 5W + 1H such as where, why, who, when, what and how in designing architectural designs. enterprise at PT. Mitra Telematika Utama. This stage functions in identifying what objects are involved in architectural design.

Table 1. 5W+1H

No	5W+1H	Description
1.	*What*	Object : Scope of an Architecture Description: Designing enterprise architecture at PT. Major Telematics Partner
2.	Who	Object : Who designs the model and is responsible Description: a. Designer name : M Alvie Helmuzar b. Who is in charge: Leaders of PT. Major Telematics Partner
3	Where	Object: Place to do research Description: PT. Mitra Telematika Utama di Jl. Pasar 2, Komp. Grand Nusa Setia Budi No. A5 Ring Road Medan – Sumatera Utara
4	When	Object : Completion Time Description : May 2022
5	Why	Object : Why make enterprise architecture design Description : The purpose of designing an enterprise architecture is to make it easier for PT. The main Telematics partner in carrying out its business activities. In addition, it realizes the need for IS/IT which produces output in the form of an application roadmap and blueprint
6	How	Object: Using what in designing enterprise architecture. Description: The architectural design is designed using a TOGAF ADM framework

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B. Phase A: Architecture Vision

Create a uniform view of the importance of enterprise architecture to achieve organizational goals formulated in the form of strategy and determine the scope of the architecture to be developed.[8]

1. Company Profile
   Mitrama is an abbreviation of Mitra Telematika Utama, where the abbreviation of Mitrama is listed on the logo which is given the symbol of an eagle's eye which is symbolic of foresight to see an opportunity, never give up, protection, speed of strength and power in the air. PT. Mitra Telematika Utama is engaged in information technology (IT).
2. Defining Vision and Mission
   The definition of the vision of PT Mitra Telematika Utama is to make a company that is totality, professional, has above average quality and is trusted in technology development.
   not to forget that PT Mitra Telematika also has a mission, namely to produce quality and competitive IT products, provide professional services to partners, develop mutually beneficial partnerships, create the best and latest innovations for each product, optimize benefits and added value for partners.
3. Organizational Structure

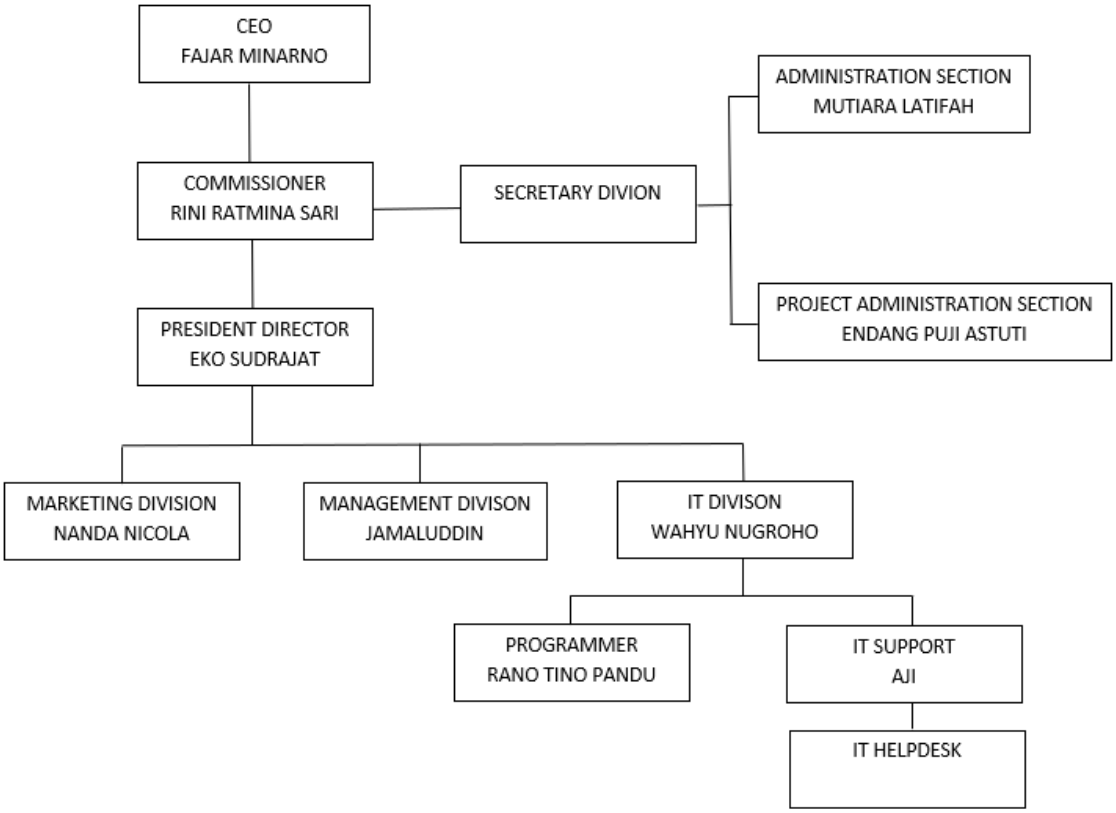

Fig. 3 Organizational Structure

4. Organizational Structure Proposal
   The reason why there is a proposal for an organizational structure is that in the current organizational structure, PT. Mitra Telematika Utama in the IT division still lacks subsections to focus on handling communication between customers such as answering all questions from customers related to technical matters. The following is a proposal from the organizational structure of PT. Mitra Telematika Utama.

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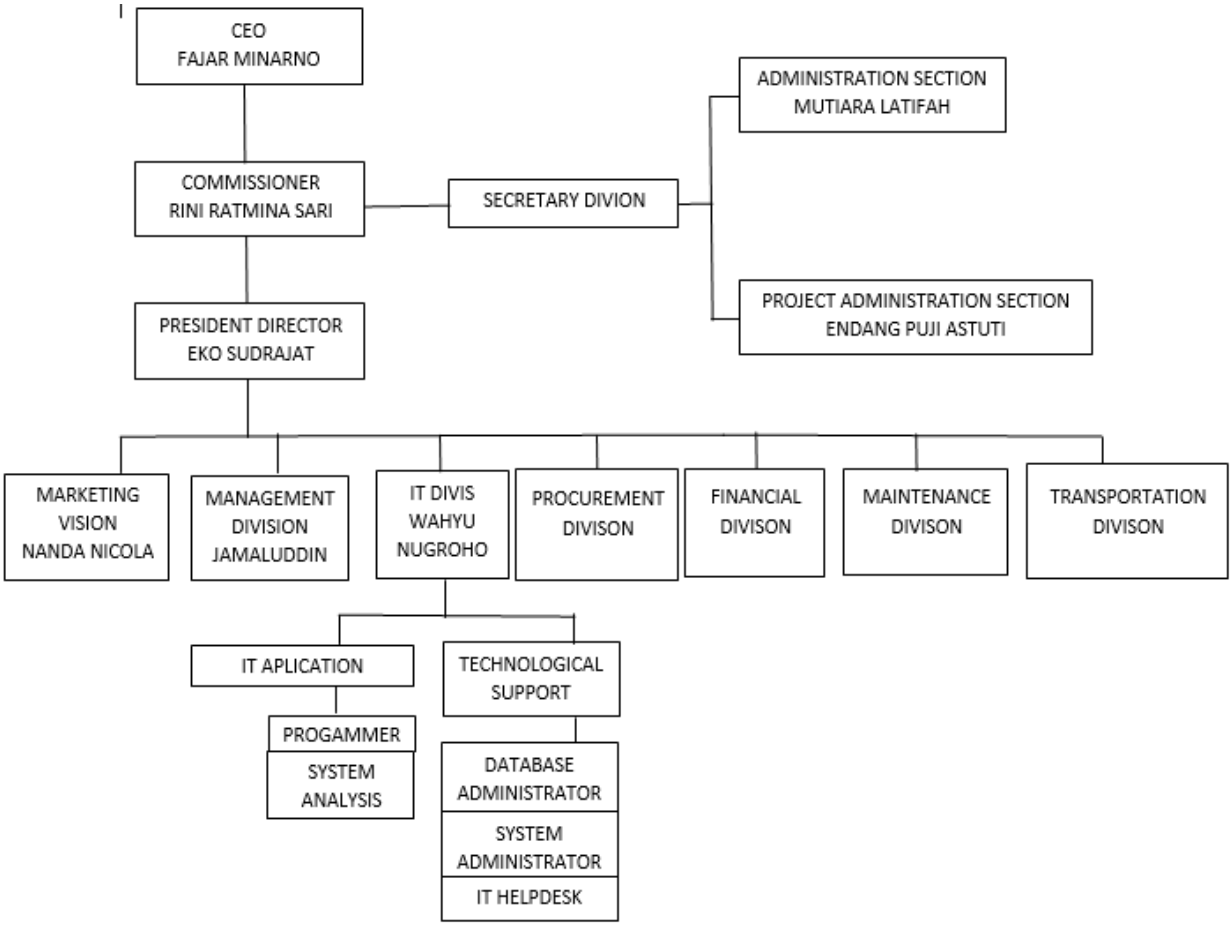

Fig. 4 Organizational Structure Proposal

5. Analysis Value Chain

The value chain has the purpose to classify all business activities in PT. Main Telematics Partner. Classification of business activities produces two groups, main activities and support activities.

Support Activities	Administration					
	Information technology management					
	Staffing					
Main Activities	***Inbound Logistic*** 1. Receipt of supply of goods from suppliers	***Operations*** 1.Maintenance 2.Packaging 3.checking	***Outbound Logistic*** 1.Product Delivery 2.Warehousing	***Marketing*** 1. Promotion of goods and services by phone and CV	***Service*** 1. Services that prioritize customer satisfaction (installation and repair)	**Margin**

Fig. 5 Analysis Value Chain

Caption

a. Main activities
   1. Receipt of supply of goods from suppliers.
   2. maintenance, packing, checking

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3. product delivery, warehousing
4. Promotion of goods and services by phone and cv.
5. Services that prioritize customer satisfaction.

b. Support activities
1. Administration
2. Information technology management.
3. Staffing

C. Phase B: Business Architecture

At this stage, the author will describe the business architecture contained in this final project including mapping business processes, business functions, and business services. There are business processes and sub-processes in each business service, there are also some business functions and business sub-functions in each business process, while small activity units are included in the business sub-function.

1. Business services: procurement/services and sales
2. Business process: procurement service and sales service
3. Business functions: ordering goods to vendors, finance, receiving orders, shipping, marketing

Architectural business design proposal :

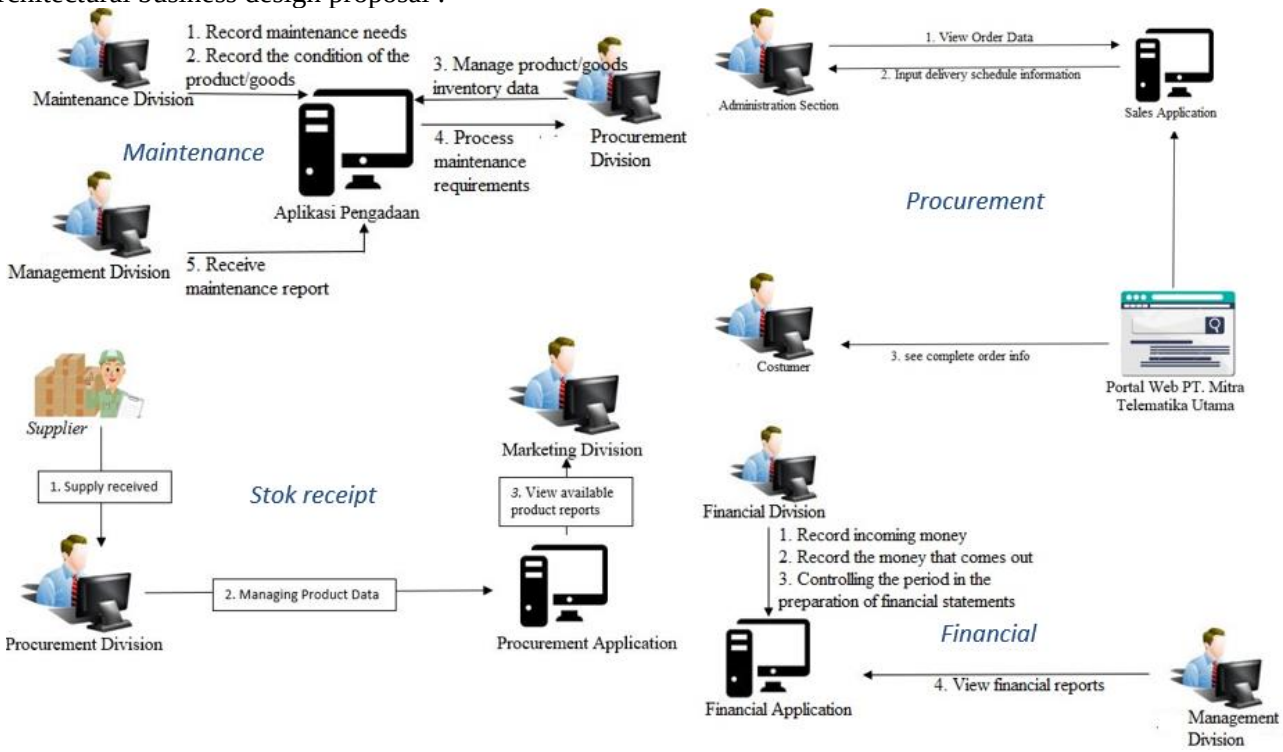

Fig. 6 Architectural business design proposal part one

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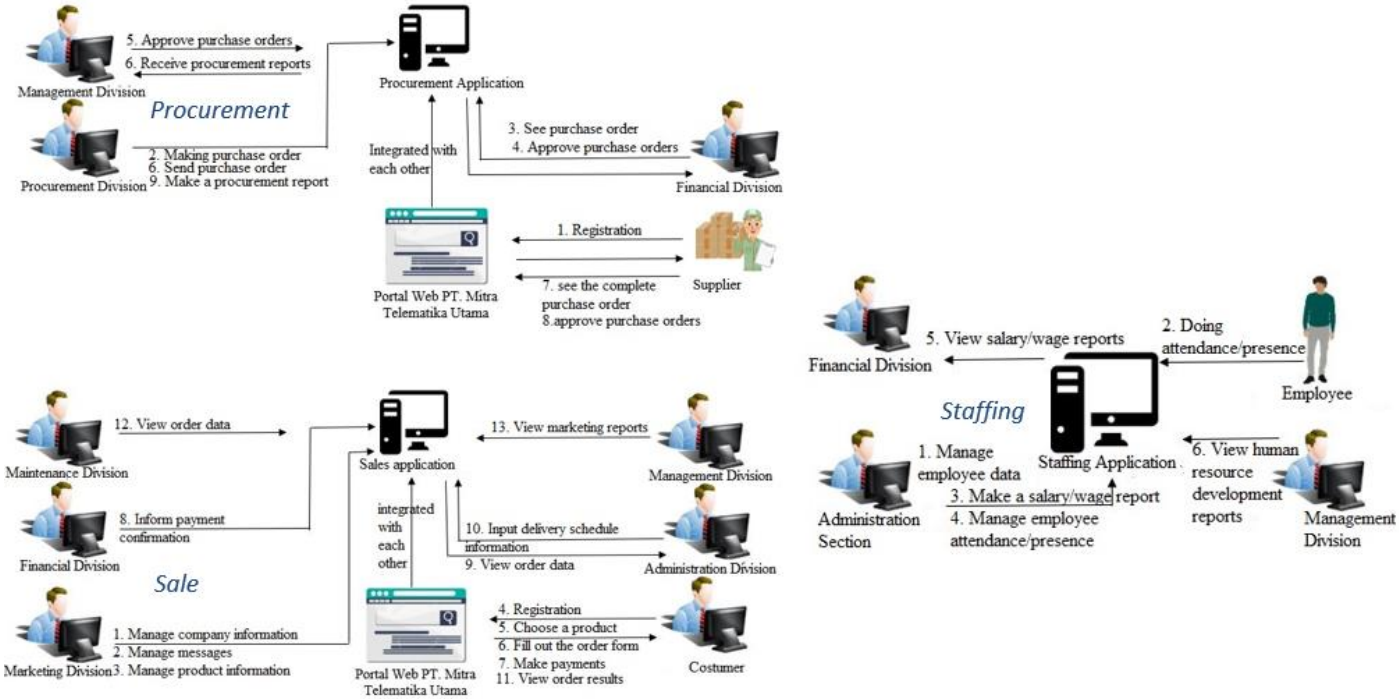

Fig. 7 Architectural business design proposal part two

D. Phase C: Information System Architecture

this stage the emphasis is on how to develop an information system architecture.

1. Architecture Aplication

   To answer the needs of the application architecture at PT. Mitra Telematika Utama, There are five proposed application architecture designs, such as the PT. Main Telematics Partners, procurement applications, personnel applications, financial applications, and sales applications. The tools that will be used in designing the architecture of this application are use case diagrams. The reason for using use case diagrams is to visualize all actors in carrying out their roles in each application, in each application what actors are doing, and also to show the correlation of each actor to the use cases contained in each application.

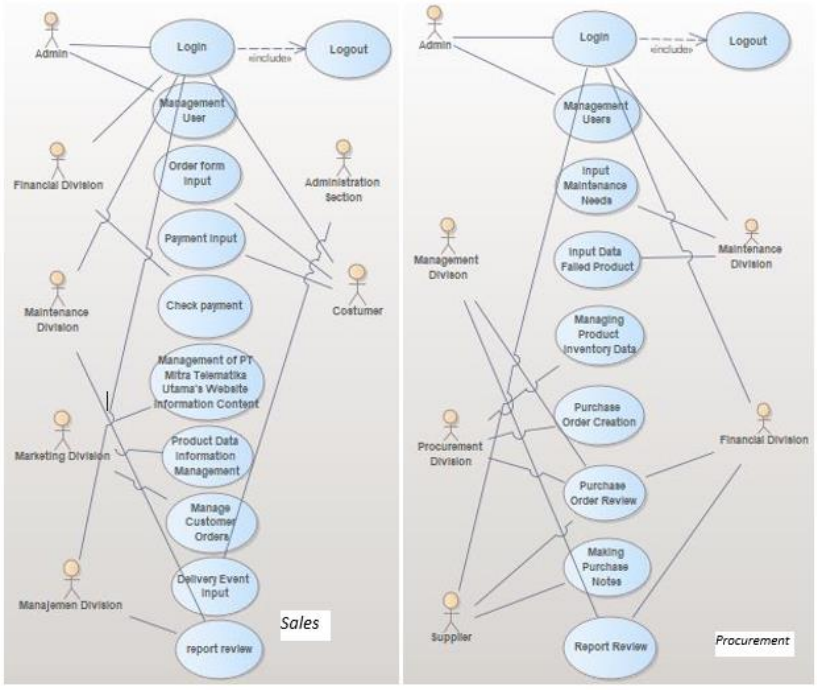

Fig. 8 Architecture Application 1

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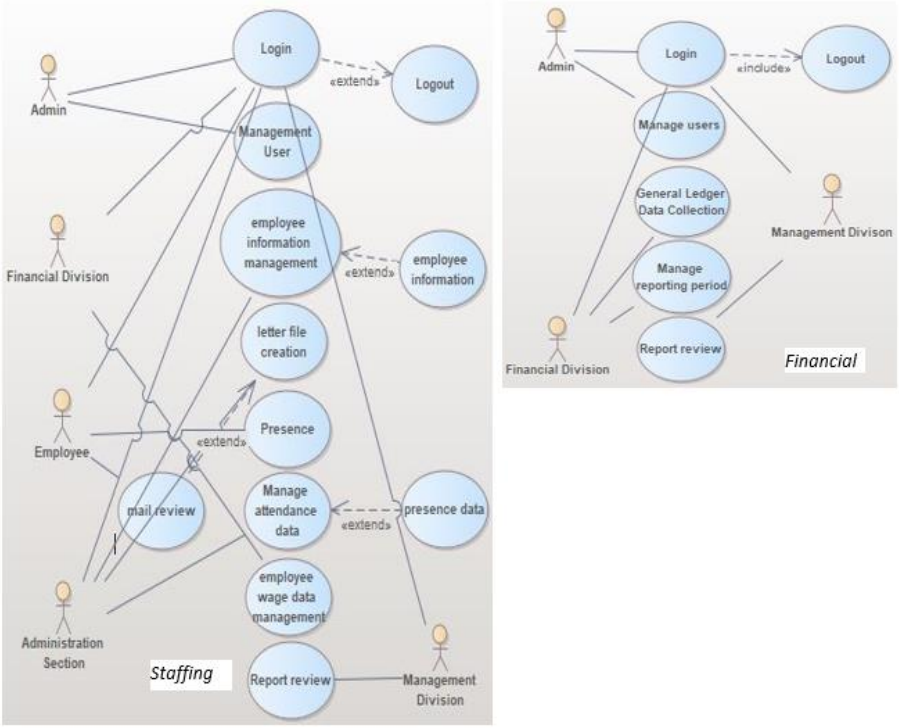

Fig. 9 Architecture Application 2

2. Data Architecture
   Designing the data architecture is done at this stage. In designing the data architecture using data dissemination diagram tools.

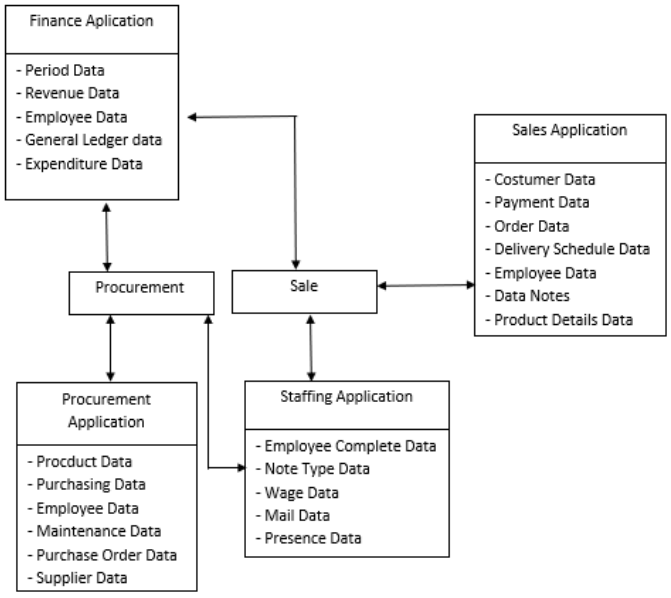

Fig. 10 Data Architecture

E. Phase D: Technology Architecture

This stage refers to the evolution of the technology architecture defined in the application architecture into a set of technology components representing multiple components such as software, hardware, and networks in a manner that is individually organized and configured on the technology platform.

1. Internal Network Configuration

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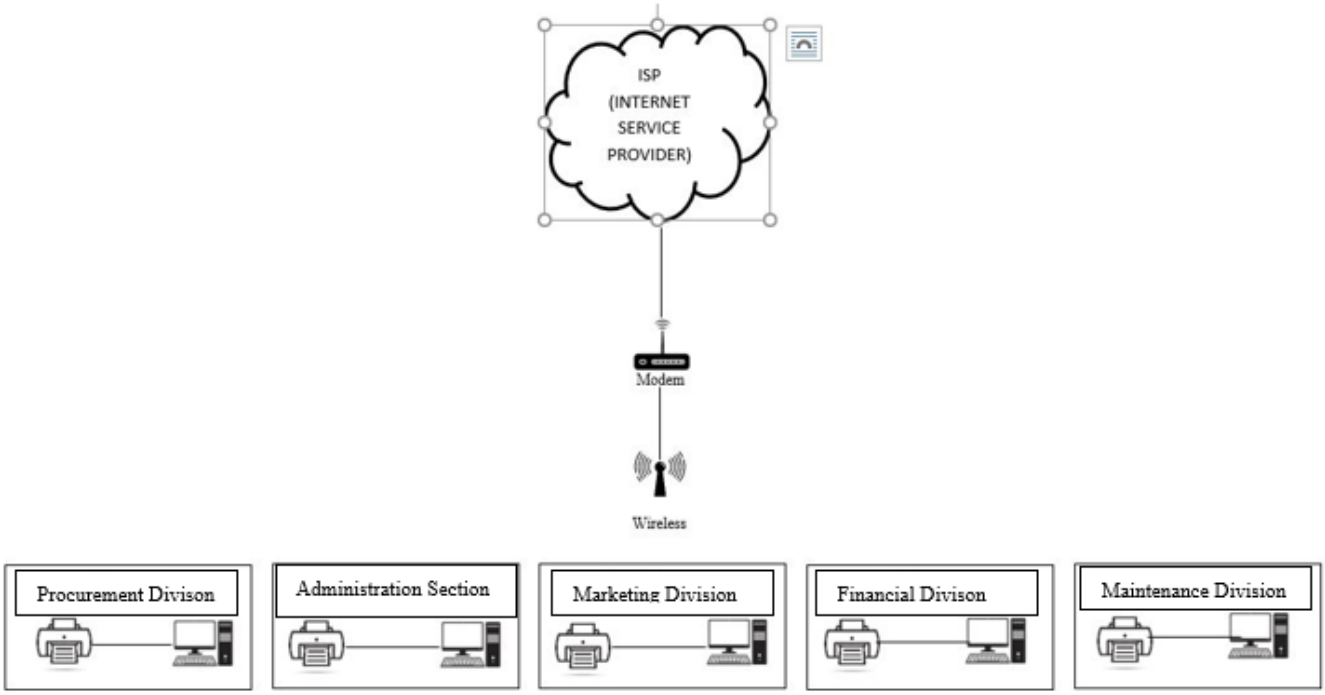

Fig. 11 Internal Network Configuration

In sending or receiving data, PT Mitra Telematika Utama still relies on paper-based and uses e-mail between divisions and sections. The network architecture currently only relies on the internet network available there and is also considered inflexible. Therefore, a technology network is proposed as follows:

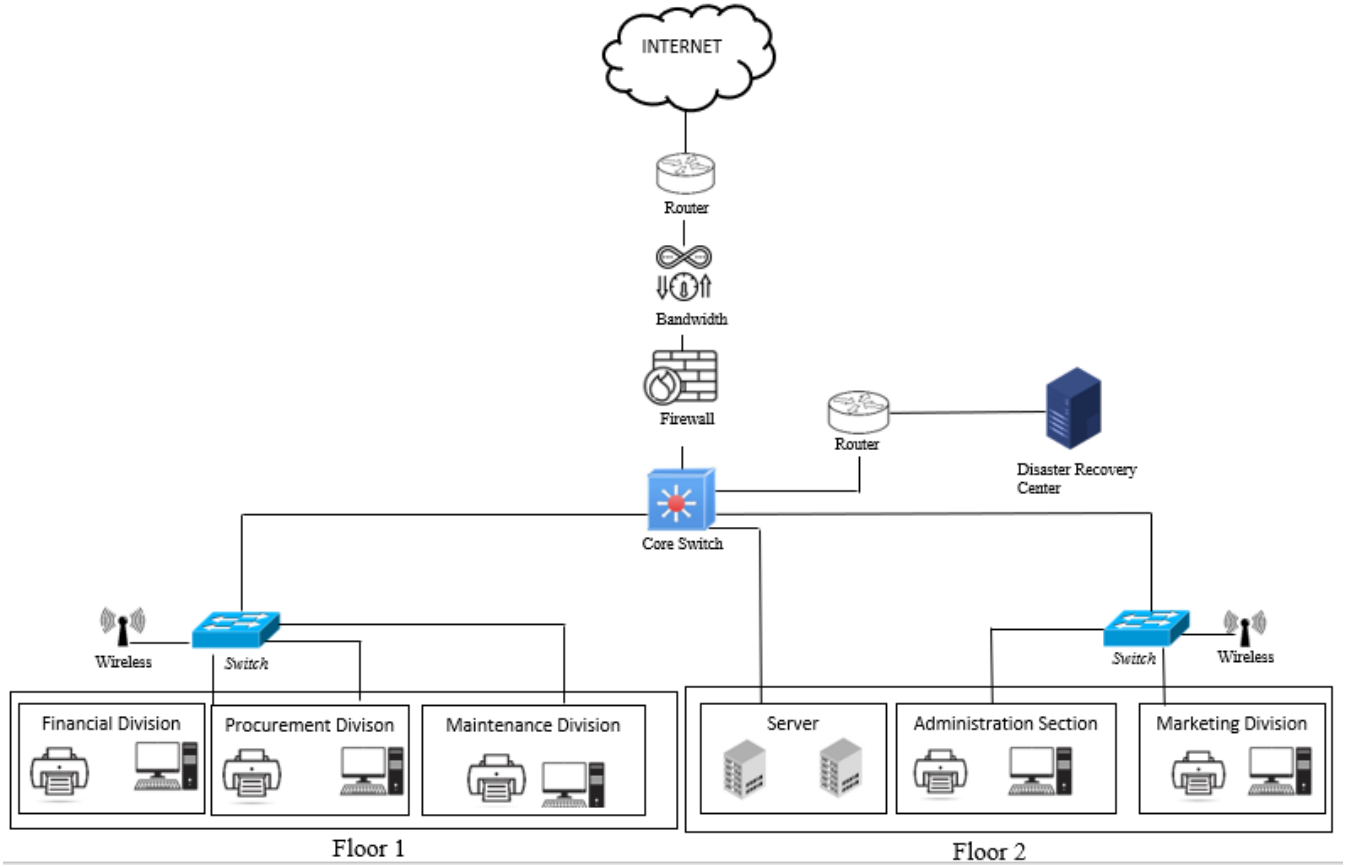

Fig. 12 Network architecture proposal

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F. Phase E: Opportunities and Solutions

From all architectural designs, there are opportunities to create information systems that form an enterprise architecture that can help companies develop their business processes, and also have the opportunity to change legacy systems in the future if more modern technologies emerge.

With this architectural design, it can finally provide solutions to business processes that in carrying out the process are still doing the bookkeeping method manually.

G. Phase F: Migration Planning

The purpose of this stage is to develop procedures for changing the technology that uses the old system to the new system. At this stage, it will describe a series of applications regarding the application to be implemented according to its priorities and also regarding the application roadmap.

1. Application Sequence

   In describing a series of applications, we will use an operational perspective which has a function in determining a series of application applications. The operational perspective consists of two, namely the front office system, which means a collection of application systems that aim directly at serving users, and the back office system which means a collection of application systems whose purpose is to assist activities such as general or administrative activities.

Table 2. Application Secuence

No	Application Name
1	Website PT. Mitra Telamatika Utama
2	Procurement Application
3	Sales Application
4	Financial Application
5	Staffing Application

The front office system consists of the website of PT. Mitra Telematics Utama while the back office system consists of procurement applications, sales applications, financial applications, and personnel applications.

2. Application Roadmap

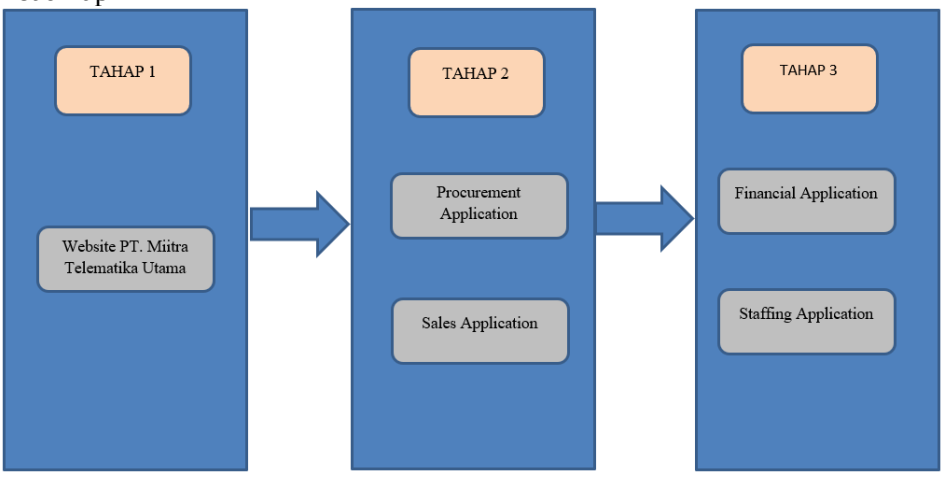

Fig. 13 Application Roadmap

The first thing to do is create a web whose goal is that the web becomes a container for each application. Making the procurement application has the second order to be done. Making sales applications has a third order that is done. Making financial applications has a fourth-order that is done. Making a staffing application has a fifth order to be done.

IV. CONCLUSION

PT. Mitra Telematika Utama in carrying out daily business processes have not optimized the use of information systems and technology. Therefore, in this study, create an enterprise architecture design in order to adjust the IS/IT strategy and business strategy. In designing enterprise architecture, researchers utilize the TOGAF ADM framework so as to create a blueprint for the main architecture contained in TOGAF such as technology architecture, business architecture, data architecture and application architecture.

PT. Mitra Telematika Utama only use Microsoft Office and Microsoft Excel as supporting applications in carrying out daily business processes. As a result, the data are not collected or are still scattered in each section and are not integrated with each other. Therefore, this study makes an enterprise architecture design that maximizes the use of IS/IT in order to create an automated system through integrated applications in each section such as the sales application architecture and procurement application architecture so that with this design they are able to provide good business services. at PT. Mitra Telematika Utama.

REFERENCES

[1] A. M. Yusuf and B. Permana, "DENGAN MENGGUNAKAN TOGAF ADM (Studi kasus : Yayasan Pendidikan Rosma)," vol. 14, no. 1, pp. 24–32, 2019.

[2] Suhendri, "Perancangan Arsitektur Sistem Informasi Sekolah dengan The Open Group Architecture Framework(Togaf) (Studi Kasus: Pondok Pesantren Ar-Rahmat)," *Infotech J.*, vol. 1, pp. 40–46, 2015, [Online]. Available: https://jurnal.unma.ac.id/index.php/infotech/article/view/43

[3] T. Ramadhane, I. Santosa, and L. Ramadani, "Perancangan Arsitektur Umum Perushaan Telekomunikasi Pada Proses Capacity Management Menggunakan Etom, Sid, Dan Tam," *JIKO (Jurnal Inform. dan Komputer)*, vol. 5, no. 1, pp. 38–46, 2022, doi: 10.33387/jiko.v5i1.3983.

[4] Pranata Komputer, "The Open Group Architecture Framework (TOGAF)," *https://prakom.banjarmasinkota.go.id/*, 2021. https://prakom.banjarmasinkota.go.id/2021/10/the-open-group-architecture-framework.html (accessed Aug. 06, 2022).

[5] R. Yunis, K. Surendro, and E. S. Panjaitan, "Pemilihan Metodologi Pengembangan Enterprise Architecture untuk Indonesia. In:," *Pros. SNIKA*, vol. 3, no. 1, p. 9, 2008.

[6] T. S. M. YUSUF SANNY, DEDEN A WAHAB SYA'RONI, "Enterprise Architecture Planning Sistem Informasi," *Maj. Ilm. Unikom*, vol. 9 No.1, no. 1, pp. 21–32, 2019.

[7] M. Fitriawati, J. J. Sudirham, and Imelda, "Perancangan enterprise architecture menggunakan togaf adm 9.1 di pppptk tk dan plb bandung," p. 2014, 2014.

[8] E. Nurmiati, Z. Zulfiandri, and A. M. A. Styafi'i, "Perencanaan Enterprise Architecture …," pp. 60–68, 2020, [Online]. Available: http://journal.uinjkt.ac.id/index.php/aism