THE ADM TOGAF FRAMEWORK: ANALYSIS AND DESIGN OF SALES INFORMATION SYSTEM ON PO. BUNGA TANI

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ABSTRACT

Objective – To help MSME businesses, especially PO. Bunga Tani needs the use of information system technology.

Methodology – This research uses a qualitative method and TOGAF ADM framework can provide an overview of sales information system design on PO. Bunga Tani, by using the preliminary phase to phase E, namely opportunity and solutions.

Findings – The results of the study found MSMEs PO. Bunga Tani has problems in its business activities, so it is necessary to implement information system technology. Therefore, analysis and design of information systems to produce a blueprint for the design of sales information systems in their business processes following the needs of MSMEs PO. Bunga Tani.

Novelty – By knowing the feasibility test in analyzing and designing sales information systems using the enterprise architecture scorecard method, to understand the proposed analysis and design is feasible or not.

Keywords: Enterprise Architecture, Information System Technology, PO. Bunga Tani, Sales, TOGAF ADM Framework

JEL Classification: B26, R11

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I. INTRODUCTION

In this era of industrial revolution 4.0, many entrepreneurs are using information technology as their business medium. According to Kemper, if a company has an internet network infrastructure, then the company is ready to be competent in the era of industry4.0 (Sundari, 2019). The need for information technology in the age of industrial revolution 4.0 becomes a factor for businesses that can support the growth or development of a company. Information Technology impacts business processes that are fast and accurate and has become one of the supporting factors in decision-making for companies (Putra & Rahayu, 2020).

Information Technology can make it easier for businesses to make decisions effectively and efficiently than using traditional methods. Thus, the role of technology is vital for the company in its business processes and essential to help make a decision (risma, 2017). The benefits of technology for MSMEs businesses proved to be very helpful for MSMEs to survive in this era of industry 4.0revolution. However, its utilization has not all been felt by MSMEs (Indonesia, 2020). A survey conducted by the OECD found the cause of the lack of MSMEs in adopting technology for their business is due to the lack of knowledge and understanding of the role of technology in strategic plans related to marketing,relationships with consumers, product development and business services (OECD, 2018).

Based on information from Kompas.com, digital economy observer Yudi Candra explained, until the end of 2018, the number of micro-businesses in Indonesia reached 58.91 million and small businesses 59,260. The number of medium enterprises reached 4,987. However, that already goes digital to just 5 percent. The rest is still very conventional in the development of its business. In carrying out its role, MSMEs are required to perform a good management system, both in terms of production, inventory, sales, and accounting (Fauzi & Handoko, 2018). The significant contribution of MSMEs to GDP requires MSMEs to adapt to the development of existing technology to survive and compete in the era of industrial revolution 4.0 (Rahayu & Makinto, 2017). One example of MSME businesses that still do not use Information Technology is PO. Bunga Tani. Processing of sales data on PO. Bunga Tani is still done manually; of course, the way is very inefficient in this era of industry 4.0. In data processing that is done routinely and requires high precision, of course, very need tools that can support the work of computer devices. Using advanced and modern computer technology can make it easier for us to process data to save time used in terms of cost and space that we use (Andrianto & Wijoyo, 2020).

PO. Bunga Tani was established in 2010 and still uses manual sales and transaction management. The problem with the PO. Bunga Tani is the management of activities related to documentation/recording of sales, errors in managing the stock of goods in the warehouse that often does not match the data written, loss of records that are not well documented, often errors in calculations due to diverse data. So with the problem in the case of PO. Bunga Tani's interest writer wants to create a model of analysis and design of sales Information System for PO. Bunga Tani by using the TOGAF ADM Framework as a solution for PO. Bunga Tani requires changes to the operational management of its company.

II. LITERATURE REVIEW

MSMEs

According to Law No. 20 of 2008 concerning Micro, Small and Medium Enterprises (MSMEs), it is defined as a manufacturing company owned by an individual or individual organization and that meets the standards of micro-enterprise required by law. SMEs are autonomous economic enterprises, production, and businesses controlled by individuals or legal entities. According to PMI standards, they are not directly or indirectly managed or branched, owned, managed, or owned by medium or large companies. As required by this law, small and medium-sized businesses are autonomous, run by individuals or entities that are not controlled, or originate from small companies that directly or indirectly own, control, control, or part thereby. It's an economic production company. Large corporations or corporations whose net worth or annual turnover is governed by law (Pembangunan et al., 2019).

MSMEs classification

In its development, micro and small and medium enterprises are the largest groups of companies. The classification of MSMEs is based on the following assessment (Nugraha, 2019):

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1) Subsistence business is a small business used as a job opportunity to make a living and is often referred to as the informal sector—for example, street vendors.

2) Microenterprise is a micro-enterprise that is a craftsman but does not yet have an entrepreneurial spirit.

3) Dynamic Small Business is a small and medium business that is entrepreneurial and can accept subcontractors and exports.

4) Fast Moving Enterprise is a small and medium-sized company that already has an entrepreneurial spirit and has become a large company.

PO. Bunga Tani is a group of MSMEs Fast Moving Enterprise because it can open job opportunities and employ local farmers to be part of its business and distribute fish to various regions on the island of Java.

TOGAF ADM Framework

According to The Open Group, The Open Group Architecture Framework (TOGAF) is an architectural framework that provides methods and tools to assist in the acceptance, production, use, and maintenance of enterprise architectures. TOGAF is based on repetitive processes supported by best practices and the reuse of existing architectural assets [10]. TOGAF consists of 9 (nine) cycle phases. In phase 4 focused on the development of technological architecture (Gormantara & Emanuel, 2020).

Phase- phase TOGAF ADM

TOGAF consists of nine steps in cycle format. The fourth phase focuses on the development of technological architecture (Mulyanto, 2017):

Figure 1. TOGAF ADM Cycle

1. Preliminary Phase

   During this phase, decisions are made on how to create a design. This phase can be used as an approach to success in enterprise architecture.

2. Phase A: Architecture Vision

   In this phase, consistency is expressed in the view of the importance of enterprise architecture planning in achieving PO. Bunga Tani.

3. Phase B: Business Architecture

   This phase is about business strategy, organization, and key activity information. In this phase, the business process scenario flow on the PO. Bunga Tani.

4. Phase C: Information System Architecture

   The focus of this phase is to identify and determine the power that supports the company's business architecture and consideration of information systems.

5. Phase D: Technology Architecture

   This phase can improve or improve the operations of the information systems that have been available and can describe the technology structure needed to manage raw material procurement activities, production, and sales at PO. Bunga Tani.

6. Phase E: Opportunities and Solution

   This phase describes the results of gap analysis starting from phase A to phase D.

7. Phase F: Migration Planning

   This phase prepares and plans for migration for the implementation of the new application architecture that has been created in the previous phase.

8. Phase G: Implementation Governance

   In this phase, the project is implemented as a work plan program to achieve the desired architecture.

9. Phase H: Architecture Change Management

   This phase ensures that the architecture reaches business targets and defines the setting of the architecture change management process for the new Enterprise Architecture.

III.RESEARCH METHODOLOGY

This study took the object of MSMEs PO. Bunga Tani is an individual company run by H. Muhammad Dawud. The company is engaged in agriculture and personal trading. In its business activities, the company conducts business by selling a wide range of agricultural products, including organic fertilizers, medicinal crop pests (pesticides, insecticides, and fungicides), agri-food animal feed, and pest medicine for various types of fish. The company is also a supplier of fish that will be distributed throughout java island.

PO. Bunga Tani has an agricultural area of 12,825 ha managed by seven permanent staff and 139 farmers. Seven staff are divided into three parts, namely office, field, and warehouse. With the business growing, operational and planning needs are no longersimple for the company's development. So PO. Bunga Tani needs a sales Information System to

plan,manage and facilitate the right decision-making in developing its business.

This study using the qualitative research method. In accordance with the case, this study uses qualitative methods in the form of case studies to obtain an understanding that corresponds to the object of research. The sampling technique conducted in this study is Purposive Sampling because information data retrieval is chosen as the subject of the sample, and sampling technique is a way of obtaining data or information on a specific type of person that can provide data or information that researchers want.

Data Analysis Techniques

- Preliminary phase: collecting information data such as current business processes, a requirement management phase discusses business resources.

- Architecture Vision: understand the vision, mission, strategy, and objectives of the company.

- Business Architecture: explain how the business process architecture in developing its targets and meeting the company's needs.

- Information System Architecture: there are two architectures used, namely data architecture that includes the type and source of data

  needed and application architecture that is how the application model is designed as required.

- Technology Architecture: development of technological architecture required by the needs of the company.

- Opportunities and Solutions: this phase focuses on processing architectural identification with SWOT analysis.

IV. FINDINGS AND RESULT

1. Preliminary phase

This stage knows the business needs of the company in designing a Sales Information System. Here's the requirement catalog as a condition of business needs:

Table 1. Requirement Catalogue

	ness Requirement
	adaptive SI infrastructure
	grated sales SI
	system can be synchronized
	availability system
	tion must include business resources.

After knowing the needs of the company's business, there is an architectural principle as a guide to the basic general rules in designing enterprise architecture at this preliminary phase. This principle must be in accordance with the needs of the company and its business processes. Here are the architectural principles:

Table 2. Principle Catalogue

No	es of Principles	ciple Name
1.	Business principle	Agility and flexibility mean that the architecture created must be adjust the conditions of the company
2.	Data principl	Integrated process means that the business process must be integr with other systems
3.	Application principle	Easy to use means that the system or application must be easy to us
4.	Technology principle	Interoperability means to use of standardized software, hardware, a orms.

Description of the selection of the principal name, agility and flexibility, integrated process, ease of use, interoperability of each type of principle based on the proper needs and according to the company's request.

2. Phase A: Architecture Vision

The architectural phase illustrates the needs that support this stage of architectural vision, namely the vision and mission that supports this phase of the company's vision and mission of the Architectural vision, and the strategic plan derived from that vision, information system architecture, and similar technological, architectural vision as the organizational structure of the company—then summarized using the value chain diagram.

The next stage of architectural vision discusses the needs that support the architectural vision, namely the vision and mission of PO. Bunga Tani, business architecture vision, information system architecture vision, and technology architecture vision.

Vision of PO. Bunga Tani

Realizing solutions with farmers to increase agricultural production by using environmentally friendly agricultural products. Become,

➢ Prioritizes the best service to increase agricultural production with environmentally friendly products.

Mission PO. Bunga Tani

Develop local farmers in managing businesses in agriculture for the advancement of local Indonesian farmers and create prosperity for PO. Bunga Tani.

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> ➢ Providing support in managing the business in technology-based agriculture for the advancement of local Indonesian farmers.

Vision, Mission, and Strategic Plan of Business Architecture

➢ **Business Architecture Vision**
Create information technology systems for stakeholders in managing business processes in meeting the needs of businesses PO. Bunga Tani.

➢ **Business Architecture Mission**
PO conducts every business activity. Bunga Tani can use Information System technology to create business activities to be more effective and efficient and implement business process automation.

➢ **Business Architecture Strategy Plan**
Analyze business activities and set targets on business architecture, conduct training or briefing to all stakeholders in response to changes in the business environment.

Vision, Mission, and Strategic Plan of Information Systems Architecture

➢ **Information Systems Architecture Vision**
To strengthen the business processes in the company, Creating adaptive Information Systems.

➢ **Information Systems Architecture Mission**
Make data as information in the development of the company's business processes, improving the efficiency of staff performance, build an integrated data structure and there are data security features, making information systems user friendly, synchronize the system so that it can be used simultaneously, making the system high availability.

➢ **Information Systems Architecture Strategy Plan**
Analyze data architecture target, choose the type of data as needed by stakeholders in supporting the company's business processes, conduct training or briefing of staff on the function of a data, describe the application architecture based on the Application Architecture Vision, analyze the architecture of the application that is built to ensure that the application is in accordance with the needs of the company, in designing the application architecture using outsourcing services if there is no IT personnel in the company, conduct training to staff/employees in operating the application system.

Vision, Mission, and Strategic Plan of Technology Architecture

➢ **Technology Architecture Vision**
Provision of technology infrastructure provided with a cost-effective approach, technology development should be adapted to the integration of the system in the PO. Bunga Tani.

➢ **Technology Architecture Mission**
Manage infrastructure investment according to the right target, the integrity of all technology architectures.

➢ **Technology Architecture Strategy Plan**
Designing technology architecture according to the target, determining non-functional needs such as software and hardware according to minimum standards, and conducting

training to staff/employees in the field of technology, the company supports the budget for the provision of technology needs.
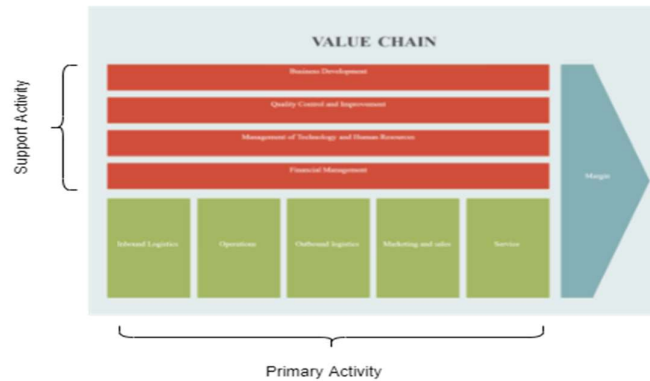
Value Chain

Figure 2. Value Chain

In analyzing the value chain, there are grouping activities, namely primary activity and support activity. PO. Bunga Tani has four supporting activities and five main activities with the following explanations:

1. Primary Activity

a. Inbound Logistic: is the stage of procurement of goods where the activity is related to warehousing and inventory.

b. Operation: the stage that conducts the selection of goods, and also the pricing of selling products

c. Outbound Logistic: activities related to the distribution and delivery of goods

d. Sales and Marketing: promotion stage to get the product known to the public

e. Service: service stage where this activity is related to the training and provision of services to both customers and employees

2. Support Activity

a. Business Development: activities in business product development and ensuring customer needs

b. Quality Control and Improvement: can ensure activities are in accordance with procedures and meet SLAs.

c. IT and HR Management: management of information technology in supporting the effectiveness of the company's main business processes as well as developing human resources in accordance with the company's objectives

d. Financial management: in conducting financial management, the company can monitor the budget efficiently in the financial statements

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3. **Phase B: Business Architecture**

The business architecture stage is conducted based on evaluating the architectural vision by analyzing the value chain. The following is an analysis of the business architecture gap.

Table 3. Analysis Gap

Current Business Activities	Analysis	Target
Manual logging of all business activities	Renew all business activities by implementing IT	Implementation of IT implementation is integral to all parts of the division based on company's business objectives
HR doesn't understand IT use	Conducting training for employees	Maximum Human Resources are required to have certification in IT implementation

Analysis gap includes analysis of the company's current business activity and the target of architecture that can be achieved in implementing the information system approximately 3-4 years. Then to achieve the target, the thing to do is to know the business process that occurs in the company.
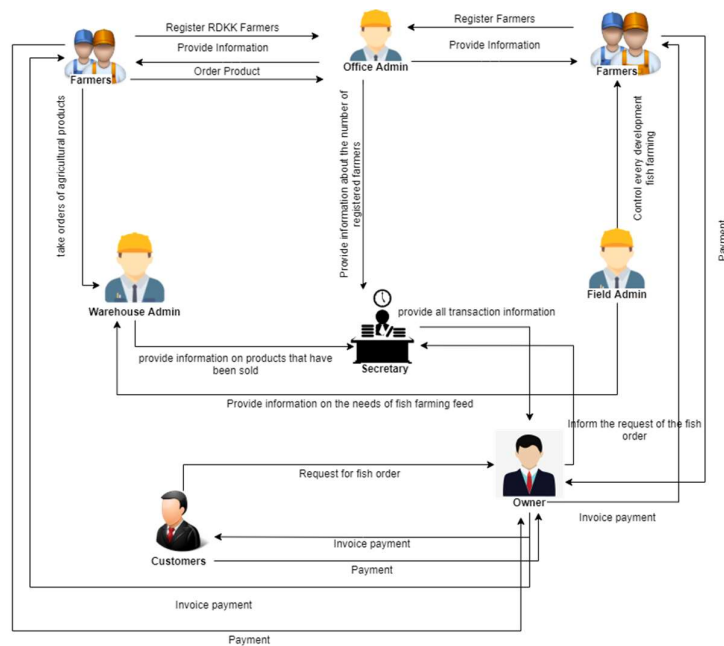
PO. Bunga Tani Business Processes

Figure 3. Business Process As Is

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The next step was to create an overview of the business processes that have implemented the sales information system:
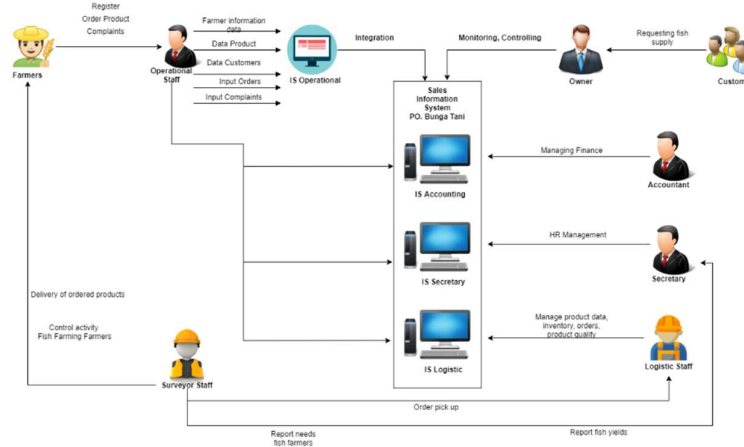

Figure 4. Process Business To Be

Information system business process, the proposed business process is submitted based on the company's needs by using sales Information System and with the results of the analysis of business architecture gap.

4. **Phase C: Architecture System Information**

After doing the next stage of business architecture, namely the architecture of information systems that contains the definition of the scope of needs based on analysis from the previous business architecture phase. The following is an analysis of the design of the Sales Information System:

Table 4. Analysis Needs

Functional Needs	Non-functional Needs
system must be able to store data on system should store customer and farmer data system must store employee data system must keep sales saction data system must be able to print data/reports	Computer Web/Browser Internet Connection

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To meet the needs of businesses that support the system with high availability 24/7, used java web socket technology and java server pages (JSP) that can run push message mechanisms to send notification messages from the server to clients (operational, accounting, logistics, and secretaries) in real time that can be run both through smartphone, PC and other devices such as laptops. Below is the integrated system design scheme as an overview of the sales information system design in PO. Bunga Tani:
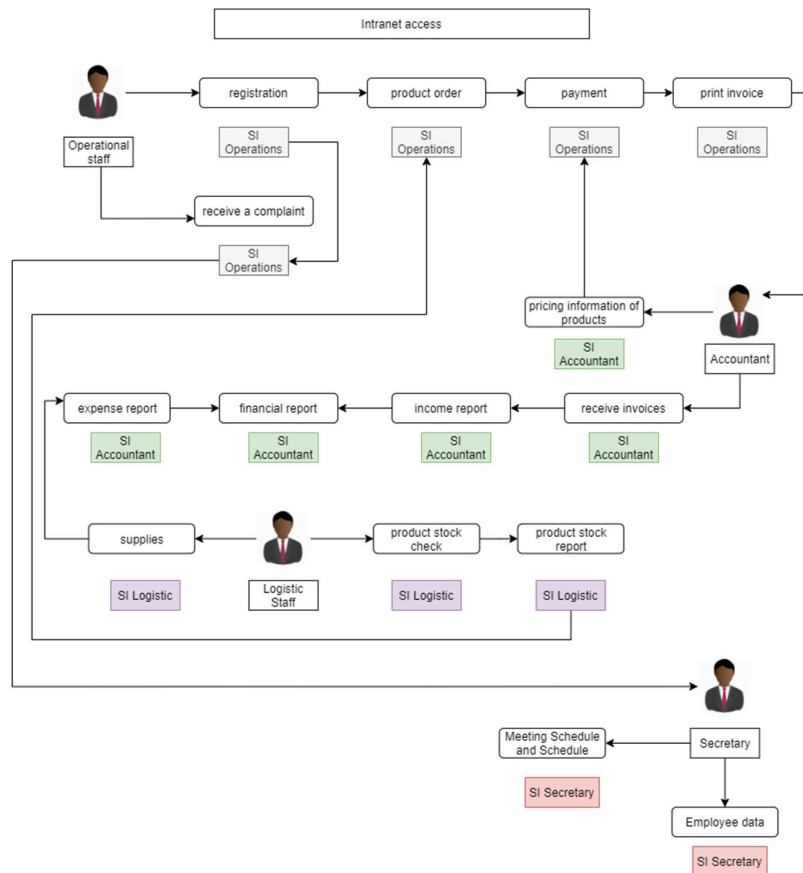

Figure 5. Sales Information System Integration Scheme

5. Phase D: Technology Architecture

After analyzing the needs at the information system architecture stage, the next step is to propose the technology architecture needed by the company; this architectural design includes technology principle, technology platform identification, and network topology, as follows:

1. Technology principle hardware, software, and devices. Hardware must support client-server technology. Software OS must support Information Systems designed and be user-friendly and support the network and, of course, GUI-based. Information technology devices must support client-servers, internet networks specifically for information systems in the company; internet access must be fast and stable and support the company's activities.

2. Identification of platform technology to support business functions in determining application strategy and data distribution. In principle, the technology requires a network of technologies that become IS liaison to each division; it is necessary to configure the hardware and software

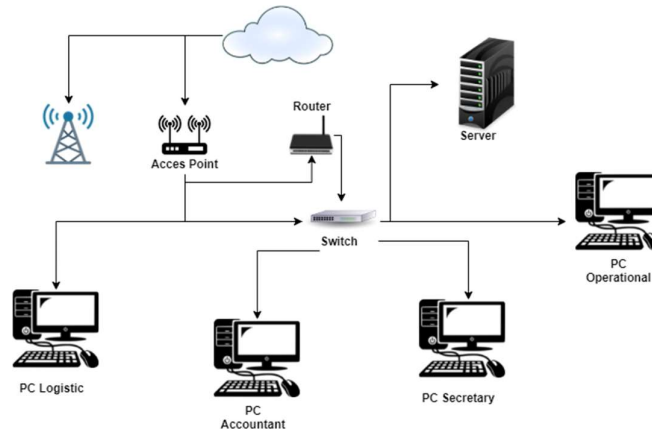3. Network topology designed to meet the needs of the company as follows:

Figure 6. Network Topology

Star topology network uses switches to connect clients, hardware elements such as servers as the center of forming a computer network that stores all information and data. The router connects two or more networks to send data and information from one network to another. Access points have the same functionality as routers and emit wireless signals from routers to create networks.

6. **Phase E: Opportunity and Solutions**

   After doing the step by step that has been passed, at this stage is analyzing the opportunities and solutions of companies applying information system technology. This stage uses SWOT analysis (Strength, Weakness, Opportunity, Threats) as opportunities and solutions as follows:

1. Strength
a. Use of Information System Technology
b. Making PO. Bunga Tani as a pioneer in the use of IT
c. Quality of Human Resources
2. Weakness
a. Limitations of network technology
b. Limited human resources for technology knowledge requires training that can costmoney.
3. Opportunity

a. The need for technology is very high

b. Evolving technology

4. Threats

a. Data loss

b. Cybercrime attacks
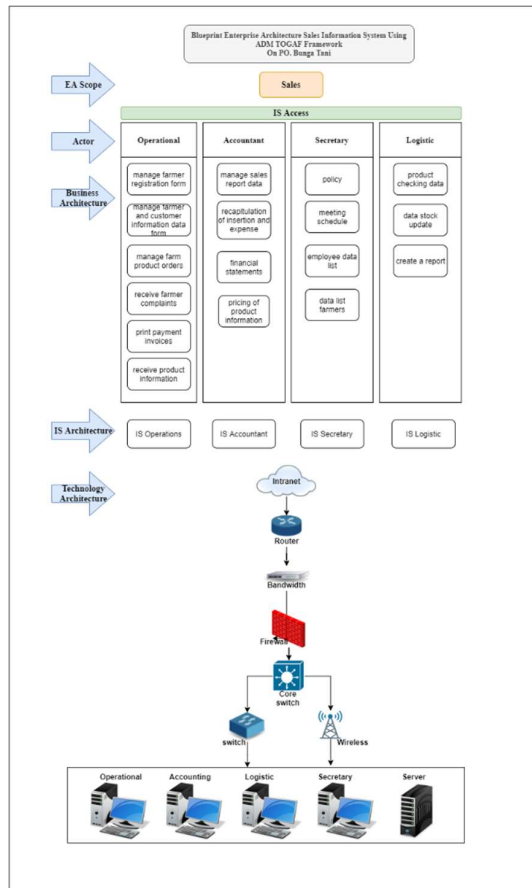
Blueprint Design IS Sales of PO. Bunga Tani

Figure 7. Blueprint Design

Its architectural scope regarding sales, divisions that interact with its systems, i.e., there are operational, accountant, secretary, and logistics sections. Business architecture that becomes business process activities that are operational parts includes managing registration and data of farmers and customers, managing product orders, managing farmer complaints, and creating and printing invoices. The accountant's department includes working income and expenses, setting product prices, and doing bookkeeping. The secretary includes managing employee and farmer data and making policies that the owner has approved. The logistics section includes product stock reports and product checks. The

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information system architecture includes IS operations, accountants, secretaries, and logistics. The technology architecture uses the star topology.

Validation

After recommending the proposed design of the architecture of the sales information system required testing in the design using the Enterprise Architecture Scorecard method created by Jaap Schekkerman with the following provisions:

- Point 0 = if unknown and undocumented
- Point 1 = if only part is known and partly documented
- Point 2 = if fully known and well documented
  With the following classifications:
- If the result is <50%, then the plan is deemed unfit for
- If the result is>50%, then the plan is considered feasible
  After obtaining the results of the feasibility test by the PO. Bunga Tani and obtained an average score of 78%, which means that the plan is feasible.

V. CONCLUSION AND RECOMMENDATIONS

First, designing this sales information system using TOGAF by performing stages from the preliminary phase's initial design to opportunity and solutions. Second, the proposal submitted from this research to PO. Bunga Tani is about designing sales information system architecture using the TOGAF ADM framework, a blueprint or overview of developing a sales information system. Third, results of feasibility test validation were conducted by PO. Bunga Tani and representatives from each division get a feasible validation result of an average of 76%. For further research, the results of this survey can be used as a basis for investigation and review for further change management to proceed to the H stage of Architecture Change Management. Furthermore, a research survey can be done using a larger sample to continue phase H Architecture Change Management.

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