Enterprise Architecture Planning in Pitcar Service Automotive Industry Using Odoo

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***Abstract*— Pitcar Service, a company operating in the automotive industry, is facing challenges in system integration, data management, and inefficient inter-departmental coordination. This research uses Enterprise Architecture Planning (EAP) to manage the implementation of information technology using Odoo. The aim is to help the company ensure that every step in the field of information technology aligns with the vision and business strategy. Qualitative methods are used by conducting interviews with the owner of Pitcar Service to gain a comprehensive understanding of operational challenges and stakeholder perspectives. This research produces documentation about the company's organizational structure and other supporting data, thus visualizing the company's business model mapping using the value chain. In addition, information related to systems and technology is also recorded for gap analysis. The results of this analysis are then used to design data, application, and technology architectures, and plan the implementation of an integrated information management system for the next 3 years. This process involves the use of Odoo software with several modules including CRM, Sales, Purchasing, Inventory, Accounting, POS, Cars, and scheduling to enhance and optimize the implementation of an integrated information management system at Pitcar Service.**

Keywords*— *Enterprise Architecture Planning (EAP), Automotive Industry, Information Systems Management, Odoo

***Abstrak*— Perusahaan Pitcar Service yang bergerak pada industri otomotif menghadapi tantangan dalam integrasi sistem, mengelola data, serta koordinasi antar departemen yang tidak efisien. Penelitian ini menggunakan Enterprise Architecture Planning (EAP) untuk mengatur penerapan teknologi informasi dengan menggunakan Odoo. Tujuannya adalah membantu perusahaan memastikan bahwa setiap langkah di bidang teknologi informasi sejalan dengan visi dan strategi bisnis. Metode kualitatif digunakan dengan melakukan wawancara dengan pemilik Pitcar Service untuk mendapatkan pemahaman yang komprehensif mengenai tantangan operasional dan pandangan pemangku kepentingan. Penelitian ini menghasilkan dokumentasi tentang struktur organisasi perusahaan dan data pendukung lainnya, sehingga dapat memvisualisasikan pemetaan model bisnis perusahaan menggunakan rantai nilai. Selain itu, informasi terkait sistem dan teknologi juga dicatat untuk melakukan analisis kesenjangan. Hasil dari analisis ini kemudian digunakan untuk merancang arsitektur data, aplikasi, dan teknologi, serta merencanakan implementasi sistem manajemen informasi terpadu selama 3 tahun ke depan. Proses ini melibatkan penggunaan perangkat lunak Odoo dengan beberapa modul termasuk CRM, Penjualan, Pembelian, Persediaan, Akuntansi, POS, Mobil, dan penjadwalan untuk meningkatkan dan mengoptimalkan implementasi sistem manajemen informasi terpadu di Pitcar Service.**

Kata Kunci*— *Enterprise Architecture Planning (EAP), Industri Otomotif, Manajemen Sistem Informasi, Odoo

I. INTRODUCTION

Advancements in industry and technology have played a role in advancing management and administration methods that provide benefits in terms of economic value, high accuracy levels, and precision[1][2]. Information system management is a strategic approach to managing information technology and data to support the goals and needs of a business organization[3]. Information system management involves planning, development, implementation, and maintenance of information systems and related technologies needed to collect, store, manage, and distribute relevant information for various levels of the organization[4]. Management involves all individuals in an organization in an integrated process that includes planning, organizing, implementing, and controlling various activities[5]. The goal of the information management process is to direct the achievement of the goals set by the organization, and this process continues continuously over time, providing a dynamic and responsive foundation for contextual changes and demands for evolution in the constantly changing business environment[6]. Efficient management implementation will result in optimal projects being realized because projects are completed on schedule, within budget, and with quality consistent with the original plan[7].

Currently, the effective use of information technology (IT) has the ability to increase the positive impact on the successful outcomes of information system management implementation[8]. The computerization of information system management has the potential to improve the effectiveness and quality of services in an automotive industry company specializing in car repairs, with the aim of achieving maximum operational efficiency[9]. The interaction between information system management and human resources (HR) in an organization plays an important role, as both have a sustainable

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impact on achieving organizational goals[10].

Enterprise Architecture Planning (EAP) is a planned approach or planning process for building an information system architecture that supports the goals and needs of company activities. EAP involves quality planning, testing, design planning, and support for the goals to be achieved by the information system and the company as a whole. This approach includes the definition of data architecture, application architecture, and technology architecture to support information in supporting business. EAP can also involve data-driven and business-driven development in enterprise architecture[11]. The advantage of EAP is to support good decision making and planning[12].

Odoo is business application software that provides various features, including CRM (Customer Relationship Management) which refers to a business strategy that integrates processes, people and technology. Odoo includes Project Management, Sales, Manufacturing, Warehouse, and Financial Management. Odoo is an open source management system or software that is very easy to use and integrate. Odoo comes in various forms, including web-based, desktop, and mobile. Odoo has various advantages, such as being supported by many communities, complete and integrated modules, ease of installation, and affordable costs[13].

The implementation of Odoo at PT. Elco Indonesia in the production module resulted in an Odoo ERP system that is tailored to the company's business processes and is capable of integrating the manufacturing module with the green procurement and green sales and distributor modules (Manufacturing Orders, Work Orders, and Overall Equipment Affection) from production orders in the Manufacturing module for Odoo-based industries[14]. Another study discussing the implementation of Odoo at CV Andri Jandika resulted in a revenue information system to record and process revenue data. The Accounting and Finance modules are designed to suit the needs of financial management[15].

Pitcar Service is a modern garage startup founded in February 2021 and headquartered in Purwokerto City, Central Java Province[14]. The scope of Pitcar Service's activities is car maintenance and repair. Pitcar Service is currently facing challenges in integrating systems, such as inventory management, repair scheduling, and customer interaction. The inability to have an integrated system can hinder operational efficiency and quick decision-making. Effective data management is crucial in the automotive service industry. Pitcar Service struggles with the collection, storage, and distribution of fast and accurate data, which can affect their ability to provide high-quality services. With several departments involved in daily operations, such as the mechanical, administrative, and customer service departments, effective coordination is key. Pitcar Service may have difficulty maintaining a smooth flow of information among these departments.

The automotive service industry, including services like those offered by Pitcar Service, often involves complex processes. With various aspects such as spare parts inventory management, repair scheduling, and interaction with customers, EAP can help design an integrated framework to manage all these aspects efficiently. EAP can assist Pitcar Service in identifying business processes that can be optimized. In the automotive service business, good coordination between different departments such as mechanics, administration, and customer service is crucial. EAP assists in designing an architecture that ensures a smooth flow of information and effective coordination among all departments.

Based on this background, the need for the implementation of EAP at Pitcar Service becomes very important, especially in the context of information system management. EAP provides a comprehensive strategic framework for designing, developing, and implementing integrated information technology solutions, in line with Pitcar Service's business needs in an effort to provide excellent service to customers. The hope is that this step can support the company in planning and expanding a framework that suits business needs, providing transparent guidance in system and technology development, and optimizing the company's capabilities by using resources efficiently. Therefore, Enterprise Architecture Planning (EAP) is carried out to formulate architecture in the implementation of information technology with the aim of helping the company ensure that every step in the IT realm aligns with the vision and business strategy[16][17]. Odoo is adopted to implement the company's architecture because this platform offers a number of features that can adapt to the company's needs and has the ability to follow the evolution of the company's needs[18].

II. RESEARCH METHOD

A qualitative approach was chosen in this study by taking a case study object, meaning the research was conducted directly at Pitcar Service to collect primary data through interviews and observations. The qualitative approach provides a deep understanding of the complexity of EAP implementation at Pitcar Service, focusing on operational challenges and stakeholder perceptions. Flexibility in data collection, such as in-depth interviews, allows for exploration of organizational nuances and dynamics, especially in the context of information technology implementation like Odoo. This approach emphasizes meaning and interpretation from the perspective of individuals or groups, which is crucial in interpreting changes such as EAP implementation. Greater involvement of stakeholders, including business owners, staff, and customers, provides a holistic perspective in the research of EAP implementation at Pitcar Service[19].

The collected data will be processed and analyzed to produce research results as seen in Figure 1.

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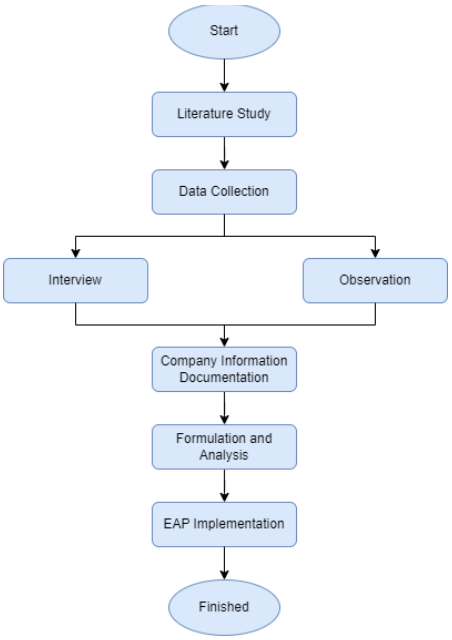

Figure 1. Research Stages

Figure 1 describes the stages of the research, as follows:

A. Literature study

Includes exploring various sources of knowledge such as leading journals and classic literature, is carried out as a solid foundation for in-depth understanding of Enterprise Architecture Planning (EAP) and Odoo software. The information obtained from the literature provides a strong intellectual foundation and a critical basis for designing holistic and innovative solutions to overcome various challenges faced by the organization.

B. Data collection

This includes conducting interviews and observations with the Chief Executive Officer (CEO) or business owner of Pitcar Service, Mr. Ilman Naafi'an. The aim is to document accurate information and collect additional supporting data, which will be the primary source in formulating and analyzing the implementation of EAP in the company environment.

C. EAP implementation

Involves processing the collected data to formulate and analyze the information that has been gathered. This is done by applying the EAP method in the business modeling process, defining the existing system and technology framework, developing a measurable data architecture plan, carefully designing the appropriate application and technology architecture, and formulating an efficient implementation plan. The approach covers technical aspects and integrates strategic aspects that support the organization's vision and mission comprehensively.

III. RESULT AND DISCUSSION

In general, the Results and Discussion chapter aims to explain and interpretation the research findings.

A. Company Data Documentation

Based on the results of interviews and observations at Pitcar Service, documentation about the organizational structure was designed, represented in Figure 2. The information in Figure 2 and other supporting data will serve as a source of information to be used in the formulation and analysis stages of EAP implementation in the company.

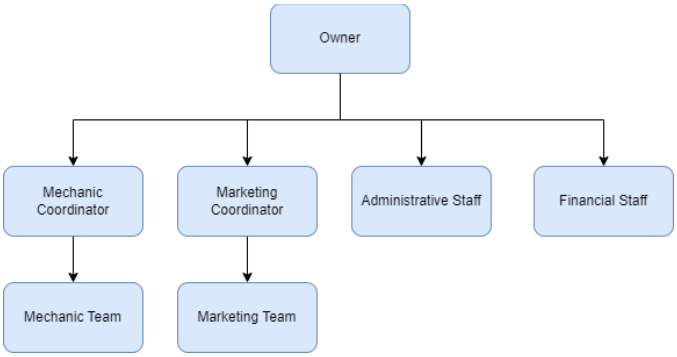

Figure 2. Pitcar Service Organizational Structure

B. Business Modeling

The value chain analysis was obtained from the interview conducted with the Owner of Pitcar Service, this analysis is used to evaluate the business environment of Pitcar Service with the aim of identifying the business processes that occur within the company. There are two dominant types of activities, namely primary activities and supporting activities as seen in Figure 3.

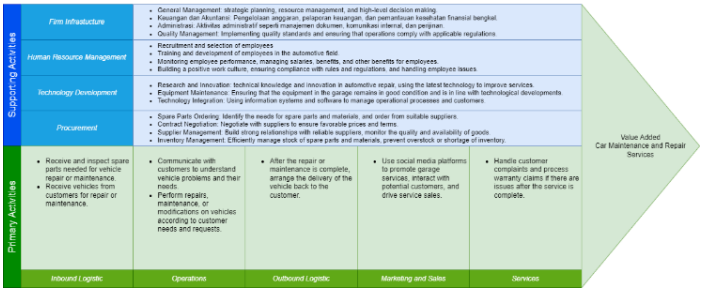

Figure 3. Pitcar Service Value Chain

1) Primary Activities

a. Inbound Logistic

- Receive and inspect spare parts required for vehicle repair or maintenance.
- Receive vehicles from customers for repair or maintenance.

b. Operations

- Communicate with customers to understand vehicle problems and their needs.
- Perform repairs, maintenance, or modifications on vehicles according to customer needs and requests.

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c. Outbound Logistic

- After the repair or maintenance is complete, arrange the delivery of the vehicle back to the customer.

d. Marketing and Sales

- Use social media platforms to promote garage services, interact with potential customers, and drive service sales.

e. Services

- Handle customer complaints by processing warranty claims if there are issues after the service is complete.

2) Supporting Activities

a. Firm Infrastructure

- General Management: Strategic planning, resource management, and high-level decision-making.
- Finance and Accounting: Budget management, financial reporting, and monitoring of the garage's financial health.
- Administration: Administrative activities such as document management, internal communication, and licensing.
- Quality Management: Implementing quality standards and ensuring operations comply with applicable regulations.

b. Human Resource Management

- Recruitment and selection of employees.
- Training and development of employees in the automotive field.
- Monitoring employee performance, managing salaries, benefits, and other benefits for employees.
- Building a positive work culture, ensuring compliance with rules and regulations, and handling employee issues.

c. Technology Development

- Research and Innovation: Technical knowledge and innovation in automotive repair, using the latest technology to improve services.
- Equipment Maintenance: Ensuring that the equipment in the garage remains in good condition and is in line with technological developments.
- Technology Integration: Using information systems and software to manage operational processes and customers.

d. Procurement

- Spare Parts Ordering: Identify the needs for spare parts and materials, and order from suitable suppliers.
- Contract Negotiation: Negotiate with suppliers to ensure favorable prices and terms.
- Supplier Management: Build strong relationships with reliable suppliers, monitor the quality and availability of goods.
- Inventory Management: Efficiently manage stock of spare parts and materials, prevent overstock or shortage of inventory.

C. Current Systems and Technology

The condition of the use of systems and technology that is currently taking place is assessed by analyzing its use at Pitcar Service, to assess whether integration has occurred or not. Details related to system integration in current use are recorded in Table I below.

TABLE I. CURRENT SYSTEM

Identification	Integrated	
	Yes	**No**
Customer Management System: to manage customer information, marketing activities, and interactions with customers.		No
Sales Management System: to manage sales status monitoring and sales reporting		No
Purchase Management System: to manage the process of purchasing spare parts and raw materials needed.		No
Inventory Management System: to manage the inventory of spare parts efficiently and monitor spare parts stock.		No
Financial Management System: to manage the recording of financial transactions, and financial reports.		No
Transaction Management System: to manage the recording of sales, payments, and inventory management, with the integration of sales and inventory management systems.		No
Vehicle Management System: to manage customer vehicle information and maintenance history.		No

Details related to current technology use are recorded in Table I below.

TABLE II. CURRENT TECHNOLOGY

Identification	Integrated	
	Yes	**No**
Hardware: server, computer, laptop, printer, and network devices.	Yes	

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Software: communication applications, garage management system.		No
Network and communication: wired network, wireless, email, social media, garage website.	Yes	
Data storage: backup data data storage server, data backup		No
Security: firewall, antivirus, data encryption		No

Table I which contains information about the Current System, and Table II, which includes information about the Current Technology, are used to perform a gap analysis, so that the results can be used to formulate a system and technology improvement plan at Pitcar Service, with the aim of ensuring smooth integration in its operations.

D. Data Architecture

Data architecture plays an important role in articulating the existing business functions at Pitcar Service. This function focuses on the development of system activities and provides support for the business processes that are taking place in the company, as seen in Table III.

The business entities and data described in Table III Pitcar Service Data Architecture stem from a value chain analysis of the business environment. This entity depiction illustrates the system flow planned for developing the proposed integrated project management application solution.

TABLE IV. PITCAR SERVICE DATA ARCHITECTURE

Business Entity	Data Entity
Management	Operational performance reports, employee evaluation reports
Finance and Accounting	Financial reports, tax reports
Customer Relations	Customer history, contact information, and customer feedback
Administrative Staff	Service scheduling, sales data

E. Application and Technology Architecture

The application and technology architecture is used to rejuvenate and develop applications needed by the company, with the aim of supporting data management and existing business functions at Pitcar Service, as seen in Table IV.

Based on Table IV there are seven recommendations for the use of modules in Odoo software that are planned to be adopted at Pitcar Service.

TABLE V. PITCAR SERVICE APPLICATION AND TECHNOLOGY ARCHITECTURE

Activity	Requirement	SI/TI Proposal
Customer Management	Manage customer information, marketing activities, and customer interactions. Includes customer contact management, tracking communication history, scheduling visits or calls, and customer data analysis.	CRM (Customer Relationship Management) Module
Sales Management	Manage price quotes, creation of sales orders, sales status monitoring, and sales reporting.	Sales Module
Purchase Management	Management Manage the purchase process of spare parts and raw materials needed. Includes features such as creating purchase orders, receiving goods, supplier management, and creating purchase invoices.	Purchase Module
Inventory Management	Manage spare part inventory efficiently. This module includes stock monitoring features, storage location management, low inventory alerts, and stock adjustments.	Inventory Module
Financial Management	Manage financial aspects of the company such as recording financial transactions, payments, receipts, and compiling financial reports.	Accounting Module
Transaction Management	Perform sales recording, payments, inventory management, and integration with Sales and Inventory modules.	POS (Point of Sale) Module
Customer Vehicle Management	Manage customer vehicle information and maintenance records, periodic maintenance schedules, service history, and vehicle reporting.	Cars Module *Customization module

F. Implementation Plan

The implementation plan is developed according to the company's needs, as well as the plan for implementing software and Odoo modules over the next 3 (three) years at Pitcar Service, as listed in Table V.

TABLE VI. PITCAR SERVICE IMPLEMENTATION PLAN

Recommended Module	Year		
	2023	2024	2025
CRM Module			
Sales Module			
Purchase Module			
Inventory Module			
Accounting Module			
POS Module			
Cars Module			
Upgrading and Optimization			

IV. CONCLUSION

The research on Pitcar Service produced documentation about the company's organizational structure and other supporting data within the company, so that it can visualize the mapping of the company's business model using a value chain. In addition, information related to systems and technology was also recorded to carry out a gap analysis. The results of this analysis were then used to design data architecture, application, and technology architecture, and plan the implementation of an

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integrated information management system for the next 3 years. This process involves the application of Odoo software with several modules including CRM, Sales, Purchase, Inventory, Accounting, POS, Cars, and scheduling to improve and optimize the implementation of an integrated information management system at Pitcar Service.

However, it should be noted that this research is limited to focusing on enterprise architecture planning, or its initial planning stage only. Conducting EAP becomes crucial to help the company ensure that every step in the IT realm aligns with the vision and business strategy. For further research, it is expected to present an analysis related to the implementation that has been carried out by Pitcar Service. This includes an evaluation of operational efficiency, improved customer service, and the financial impact of the system integration that has been done.

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