Enterprise Architecture Planning in Pitcar Service Automotive Industry Using Odoo

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***Abstract*— Utilization of information technology has an important role in the process of creating, changing, storing, communicating and disseminating information. Especially in the context of corporate business, especially in the field of information systems management, information technology brings significant benefits in managing, organizing, planning, and achieving information system goals. Pitcar Service is an entity in the automotive sector based in Purwokerto, Central Java, facing challenges in optimizing information system management activities. Lack of information system integration results in obstacles in planning, monitoring, coordination, and visibility. To overcome this, the Enterprise Architecture Planning (EAP) approach was used to design a web-based integrated information system by utilizing Odoo software for project management at Pitcar Service. The results of this research can be used to design data architecture, application architecture and technology, as well as plan the implementation of an integrated information management system over the next 3 years. The implementation of EAP in the Pitcar Service company is expected to facilitate the management and development of architecture in accordance with business needs, provide clear direction for system and technology development, and optimize the company's potential through efficient use of resources.**

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

***Abstrak*—** **Pemanfaatan teknologi informasi memiliki peran penting dalam proses pembuatan, perubahan, penyimpanan, komunikasi, dan penyebaran informasi. Terutama dalam konteks bisnis perusahaan, terutama di bidang manajemen sistem informasi, teknologi informasi membawa manfaat yang signifikan dalam mengelola, mengorganisasi, merencanakan, dan mencapai tujuan sistem informasi. Pitcar Service merupakan sebuah entitas di sektor otomotif yang berbasis di Purwokerto, Jawa Tengah, menghadapi tantangan dalam optimalisasi kegiatan manajemen sistem informasi. Kurangnya integrasi sistem informasi mengakibatkan kendala dalam perencanaan, pemantauan, koordinasi, dan visibilitas. Untuk mengatasi hal ini, pendekatan *Enterprise Architecture Planning* (EAP) digunakan untuk merancang sistem informasi terintegrasi yang berbasis web dengan memanfaatkan perangkat lunak Odoo untuk manajemen proyek di Pitcar Service. Hasil dari penelitian ini dapat digunakan untuk merancang arsitektur data, arsitektur aplikasi dan teknologi, serta merencanakan implementasi sistem manajemen informasi terintegrasi selama 3 tahun ke depan. Implementasi EAP di perusahaan Pitcar Service diharapkan dapat memfasilitasi pengelolaan dan pengembangan arsitektur yang sesuai dengan kebutuhan bisnis, memberikan arahan yang jelas untuk pengembangan sistem dan teknologi, serta mengoptimalkan potensi perusahaan melalui pemanfaatan sumber daya yang efisien.**

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

# 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 organizatio[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 impact on achieving organizational goals[10]. Therefore, the implementation of Enterprise Architecture Planning (EAP) is necessary to formulate the architecture in the implementation of information technology with the aim of supporting business aspects and the implementation plan for the architecture[11][12]. Odoo is adopted to implement the company's architecture because this platform offers a number of features that can adjust to the company's needs and has the ability to follow the evolution of the company's needs[13].

Pitcar Service is a modern garage startup founded in February 2021 and based in Purwokerto City, Central Java Province[14]. The scope of Pitcar Service's activities is car repairs, where the overall management has not yet implemented an integrated information system. This situation can create difficulties for the company in achieving its goals in completing a job.

Based on this background, the need for EAP implementation at Pitcar Service is very important, especially in the context of information system management. The hope is that this step will support the company in planning and expanding a framework that is suitable for business needs, providing transparent guidance in system and technology development, and optimizing company capabilities by using resources efficiently. The implementation of EAP in information system management in the company is carried out by utilizing Odoo software because it has the potential to reduce excesses in design, development, and development in terms of time, resources, and costs[15].

# LITERATURE REVIEW

* 1. Enterprise Architecture Planning (EAP)

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[16]. The advantage of EAP is to support good decision making and planning [17].

* 1. Management Information System

Management Information System (MIS) is a system to help companies manage, store, retrieve and analyze information to support the management decision making process. MIS consists of hardware and software that functions as the basis for a company's operations. MIS is applied in a company because of several of its main functions, such as increasing work productivity and saving operational costs within the company or organization, helping management to plan, supervise, direct and delegate work to all team members through a single command or coordination relationship, and increase efficiency and the effectiveness of the data presented in real time and more accurately[18].

* 1. Odoo

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[19].

# RESEARCH METHOD

The qualitative approach method was chosen in this research by taking a case study object, which means the research was conducted directly at Pitcar Service to collect primary data through interviews and observations. The collected data will be processed and analyzed to produce research results, as shown in Figure 1.

A diagram of a business process

Description automatically generated

Figure 1. Research Stages

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

1. 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.

1. Data collection

Includes conducting interviews and observations at Pitcar Service with the aim of documenting accurate information and gathering additional supporting data, which will be the main source in formulating and analyzing the implementation of EAP in the company's environment.

1. 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.

# RESULT AND DISCUSSION

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

* 1. 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.

A diagram of a company

Description automatically generated

Figure 2. Pitcar Service Organizational Structure

* 1. Business Modeling

A value chain analysis is used to evaluate the business environment of Pitcar Service with the aim of identifying the business processes that take place within the company. There are two dominant types of activities, namely primary activities and supporting activities, as seen in Figure 3.

A screenshot of a computer

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Figure 3. Pitcar Service Value Chain

1. Primary Activities
2. *Inbound Logistic*

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

1. *Operations*

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

1. *Outbound Logistic*

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

1. *Marketing and Sales*

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

1. *Services*

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

1. Supporting Activities
   1. *Firm Infrastucture*

* 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.
  1. *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.
  1. *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.
  1. *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.
  1. 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 |  |
| **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.

* 1. 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 |

* 1. 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** | **Requierement** | **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 |

* 1. 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.

TAB 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 |  |  |  |

# KESIMPULAN

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 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.

It is hoped that future research related to the implementation of information management modules will conduct an in-depth study of the real effects of the implementation of an integrated information management system at Pitcar Service. This research can focus on quantitative and qualitative analysis of operational efficiency improvements, customer service improvements, and the financial impact generated by the system integration. In addition, consideration should also be given to research related to the long-term sustainability of this system in the context of changing business needs and evolving technology.

##### ACKNOWLEDGEMENTS

The source of this data comes from observations and interviews with the owner of Pitcar Service, therefore we would like to thank Pitcar Service and friends who have contributed to the process of completing the research so that this research can be completed well.

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