|Jurnal Jaringan Komputer dan Keamanan |JJKK|Vol. 5| No. 2|June|Year 2024|

The Design of Enterprise Architecture Planning at PT. Glatia Plena Mas Motor Using the Zachman Framework

Muhammad Aldo[1*], Devi Udariansyah[2]

Abstract

This research aims to provide PT. Glatia Plena Mas Motor with a structured approach for achieving strategic advantages through the development of a formal business architecture. Using the Enterprise Architecture Planning (EAP) method, the study analyzes the company's business processes and develops an architectural model based on the Zachman Framework. This framework is selected for its comprehensive ability to integrate business, information, application, and technology architectures. The resulting design includes a web-based application that centralizes key transactional information. Its implementation is expected to improve decision-making, streamline operational planning, and strengthen the company's alignment with its strategic objectives.

Keywords

Enterprise architecture planning, framework, zachman framework.

Article History

Received 07 April 2024
Accepted 21 June 2025

How to Cite

Aldo, M., & Udariansyah, D. (2024). The Design of Enterprise Architecture Planning at PT. Glatia Plena Mas Motor Using the Zachman Framework. ***Jurnal Jaringan Komputer dan Keamanan,*** *5*(2), 81-89.

[1*] Universitas Bina Darma, Indonesia, Corresponding email: muhammadaldo899@gmail.com
[2] Science Technology, Universitas Bina Darma, Indonesia

Introduction

The continuous and accelerated evolution of information technology (IT) represents a significant challenge for all entities utilizing IT, spanning formal, informal, and governmental sectors. This progression mandates that organizations strategically leverage IT as a primary support mechanism for operational activities, requiring information outputs that are characterized by speed, precision, and demonstrable accuracy. Success in this environment requires organizations to maintain a sophisticated comprehension and awareness of the rapidly expanding technological paradigm.

PT. Glatia Plena Mas Motor operates as a key trading entity within the automotive sector, focusing specifically on the sale of Honda motorcycles and providing authorized Honda service. Effective data and information management are paramount for all existing business processes within the company. However, a critical deficiency was identified: the absence of a clearly defined Enterprise Architecture (EA). This missing architectural layer includes the foundational components of data, process/application, and technology/network architectures necessary for a unified information system.

This architectural vacuum has direct, deleterious effects on corporate operations. The existing information system resources are inadequate to manage the full scope of business processes, leading to a critical lack of integrated corporate data. This deficiency frequently results in errors during the management of sales data, indicating poor data quality and data governance. The operational systems are currently described as semi-automatic, relying heavily on conventional procedures supplemented by basic software solutions such as Microsoft Excel and Myob. This hybrid structure introduces a high risk of human error and necessitates extended processing times, thus compromising the effectiveness of key processes.

The consequence of this low IT maturity is a profound impairment of the company's strategic capacity. The inability to accurately and quickly analyze business progression, particularly concerning sales performance and regional vehicle distribution, directly inhibits management's capacity to formulate and execute strategic decisions. This sequence demonstrates that data non-integration acts as the root cause, manifesting as quality errors, which subsequently preclude accurate business intelligence, ultimately crippling strategic management capabilities. Consequently, the organization requires a comprehensive strategic information system plan to facilitate a transition toward more effective and efficient business processes.

The selected methodology for modeling the required information system architecture is Enterprise Architecture Planning (EAP). EAP is an effective approach because it emphasizes planning for data quality grounded in the core business requirements of the organization. The EAP process mandates the systematic articulation of data architecture, application architecture, and technology architecture. The primary output of the EAP method is a formal planning document or blueprint for information system development, serving as a governance framework for the organization's information technology over a specified period.

To maximize the architectural rigor, the Zachman Framework is deployed as the supporting ontology. This dual methodological approach addresses a critical consideration:

while EAP provides the prescriptive steps for strategic definition (focused primarily on the Planner and Owner perspectives), the Zachman Framework guarantees comprehensive documentation across all necessary stakeholder views (including Designer and Builder). The Zachman Framework was specifically chosen because its structure inherently covers all four vital architectural domains—business, information, application, and technology—whereas other frameworks often discuss these components in isolation or partially. The resultant structure supports the essential architectural functions required by the organization, including integration, development, management, and change control.

The core purpose of this study is to formally delineate the systematic method used for designing Enterprise Architecture Planning, employing the Zachman Framework, to guide the comprehensive information technology development strategy at PT. Glatia Plena Mas Motor.

Methodology

Enterprise Architecture Planning (EAP) as a Framework Extension

The research procedure strictly adheres to the established methodology of Enterprise Architecture Planning (EAP), which is treated conceptually as an extension or development layer built upon the Zachman Framework. EAP furnishes practical guidance specifically for generating the architectural artifacts corresponding to the first two rows of the Zachman Framework, which embody the perspectives of the Planner and the Owner. Furthermore, the scope of EAP in this context is confined to the first three columns of the framework, which encompass the core architectural domains of Data (What), Function (How), and Network (Where) of the information system.

EAP is structured around seven primary components, which are executed through six sequential stages, defining the necessary steps for planning and implementing the information system architecture.

Synthesis of EAP Stages, Focus, and Deliverables

The formal research process begins with an initial data collection phase, involving detailed observations, structured interviews, and a comprehensive literature review. Following this initial work, the research progresses through six predefined EAP phases, each producing specific required architectural outcomes. For the EAP Research Phases, Focus, and Outcomes, see Figure 1.

The sequencing of deliverables reflects a structured progression from strategic definition to technical implementation planning. Notably, Stage 3, Data Architecture, requires the generation of specific Unified Modeling Language (UML) artifacts, including Use Case Diagrams, Activity Diagrams, and Class Diagrams, in addition to the Entity-Relationship Diagram (ERD). This requirement indicates a systematic integration point within the EAP process: validating that the proposed data structure (ERD) is logically sound and capable of supporting the specified system functions (UML artifacts) before proceeding

to the formal definition of the application portfolio in Stage 4. This pragmatic overlap ensures robust alignment between the required data structures and the organizational process logic early in the design phase.

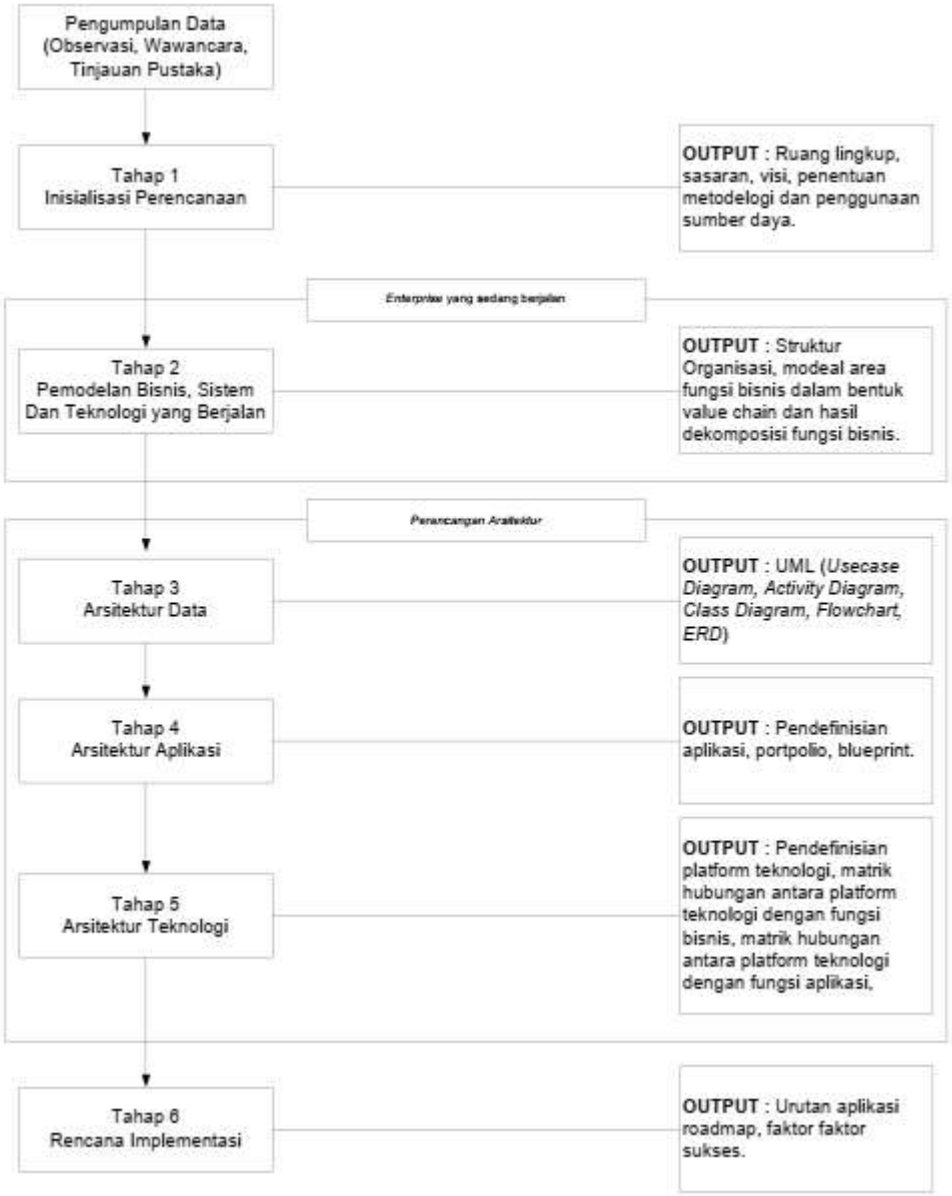

Figure 1. Research Framework

Results and Discussion

This section details the architectural artifacts and specifications generated by applying the EAP methodology, categorized according to the corresponding perspectives of the Zachman Framework.

Review of Enterprise Conditions

The initial phase involved the Planning Initialization (3.2.1), where the organization was formally defined as the research object. The core objective was ensuring that the information system planning's vision, scope, and goals were inextricably linked to the organization's core business processes. This was followed by the Review of the Current Enterprise Condition (3.2.2), which involved a two-step process: modeling the existing business processes and identifying the essential human resources involved. Key roles identified include the Administration & Finance Chief (AFC), the service counter section, the salesman section, and the mechanic section. Finally, the Review of the Future Enterprise Condition (3.2.3) utilized the current state analysis to propose and outline the desired data architecture, application architecture, and technology architecture necessary for the target state.

Zachman Framework Architectural Perspectives

The architectural findings are presented below, starting with the high-level contextual views and progressing toward the physical implementation models.

Planner Perspective

The Planner Perspective (Row 1) defines the contextual scope from a high-level, external viewpoint, encompassing several dimensions of organizational analysis. The What (Data/Entities) dimension involves the description of the data elements or entities relevant to the information system governing operational activities, while the How (Function/Process) dimension articulates the processes occurring within the organization's operations at a global or abstract scale. The Where (Network/Location) dimension specifies the physical location of PT. Glatia Plena Mas Motor at Jln. Perintis Kemerdekaan No.8 Palembang and identifies its core business function as the sale of Honda motorcycles and authorized service provision. The Who (People/Roles) dimension highlights the crucial individuals and roles involved in the business processes, referencing personnel categories established during the business process modeling phase. The When (Time/Schedule) dimension provides an abstract description of the activities and time dependencies that characterize the organization's operations as perceived by the planner. Finally, the Why (Motivation/Strategy) dimension explains the fundamental objective of the organization, namely the pursuit of systematic and structured operational activities essential for achieving and realizing its vision and mission.

Owner Perspective

The Owner Perspective (Row 2) transitions from the abstract context to conceptual models, defining the enterprise from the viewpoint of the business owner. The What (Data) dimension details the functional relationships between the entities defined in the Planner perspective, explaining how these relationships facilitate the execution of Enterprise Architecture Planning (EAP) design processes. The How (Function) dimension elaborates upon the conceptual processes represented in the diagrams developed under the "What" column, translating entity relationships into operational workflows. The Where (Network) dimension specifies the conceptual or logical locations where the proposed information system is intended to be deployed, while the Who (People) dimension outlines the assignment of human resources designated by the owner for the implementation and maintenance of the EAP design. The When (Time) dimension provides the proposed schedule governing the execution phases of the design, and the Why (Motivation) dimension critically defines the steps necessary to ensure alignment of system and information technology development with the overarching business strategy and processes. Establishing this alignment at the Owner level creates a formal governance mechanism, ensuring that subsequent technical specifications developed by the Designer and Builder remain directly traceable to, and compliant with, the business owner's strategic intent.

Designer Perspective

The Designer Perspective (Row 3) addresses the logical form of the "System Model." The designer's viewpoint translates conceptual business needs into rigorous, implementable specifications. The artifacts generated at this level include detailed logical models, documentation for project management, and the precise definition of system requirements, specifically the functional requirements. This is where the UML and ERD models developed during EAP Stage 3 are validated as logical specifications for the future system.

Builder Perspective

The Builder Perspective (Row 4) represents the implementation view, providing the physical specifications required by programmers and guiding development personnel to work directly according to the models specified in Row 3, managing system configuration and facilitating deployment. The Why/Motivation (Technology Stack) dimension reflects design decisions driven by operational needs and constraints, with the core technology stack comprising MySQL managed via PhpMyAdmin, PHP and HTML programming languages, Bootstrap Admin LTE Template for application layout design, and Apache as the webserver, all constrained to operate solely within the local administrator network to ensure cost-effectiveness, internal operational control, and minimized external attack surfaces. The How/Function (System Behavior) dimension is modeled through sequence diagrams that illustrate step-by-step behaviors in specific scenarios, including the Login Sequence Diagram, the Management (Pimpinan) Sequence Diagram, and the Service Counter Sequence Diagram. The What/Data (Physical Database Design) dimension contains physical data definitions consistent with the logical data model defined in Row 3, providing blueprints for

tables such as customer, vehicle unit, sales transaction, service, and user, thereby fulfilling business function requirements. The Who/People (Interface Design) dimension specifies graphical user interfaces tailored to user roles, including the login page, home page, category page, vehicle unit page, customer page, transaction page, vehicle unit report page, and sales report page. Finally, the Where/Network (Physical Topology) dimension details the proposed network infrastructure, in which a central server connects key operational areas Administration, Branch Manager, and Service Counter via hub switches, supplemented by an AP Client Wireless connection.

Synthesis of Architectural Artifacts

The following table synthesizes the essential deliverables generated across the foundational four perspectives of the Zachman Framework, providing a concise overview of the architectural scope achieved through the EAP process.

Tabel synthesis of Architectural Artifacts by Zachman Perspective

Zachman Perspective (Row)	Artifact (What/Data)	Artifact (How/Function)	Artifact (Where/Network)	Artifact (Why/Motivation)
R1: Planner (Contextual)	Entities/Data related to Operations	Global Operational Processes	Company Location	Vision and Mission
R2: Owner (Business Model)	Entity Relationships (Conceptual)	Business Process Diagrams	System Deployment Location (Logical)	Strategic Alignment
R3: Designer (System Model)	Logical Data Model	System Functions (Process Logic)	System Architecture/Distribution	Functional Requirements
R4: Builder (Technology Model)	Physical Database Tables (5 types)	Sequence Diagrams (Login, Pimpinan)	Proposed Network Topology	Technology Stack (PHP, MySQL, Apache)

Conclusion and Recommendations

The application of the Enterprise Architecture Planning (EAP) methodology, structured and governed by the ontological framework of Zachman, has yielded significant outcomes for the information technology development strategy at PT. Glatia Plena Mas Motor.The analysis confirms that utilizing EAP in conjunction with the Zachman Framework effectively facilitates the establishment of a robust and well-integrated information system foundation for the organization. This architectural approach directly addresses the initial deficit of unintegrated data and process silos. Furthermore, the resultant architectural blueprint is proven to serve as an indispensable governance tool. By defining the alignment between business strategy (Owner Perspective) and technical specifications (Builder Perspective), the implemented framework ensures that all subsequent technological deployments and organizational actions remain strictly compliant with and traceable to the fundamental company objectives. Finally, the inherent structure of the Zachman Framework provides substantial methodological clarity for the EAP process. By explicitly defining the required deliverables for each perspective and column, the framework describes the entire sequence of the work process in an easy-to-understand manner, ensuring that all necessary architectural artifacts are explicitly stated and generated. This transparency is essential for managing complexity and communicating the architecture across different stakeholder groups, from strategic planners to system implementers.

References

Ali, t., & Tyas, T. S. (2013). Perancangan Enterprise Architecture Planning (EAP) Pada Proses Manajemen Aset Dengan Zachman Framework. Jurnal Sarjana Teknik Informatika, 1, 4.

A. S., Rosa dan Shalahuddin, M. 2018. Rekayasa Perangkat Lunak Terstruktur Dan Berorientasi Objek. Bandung: Informatika.

Adzhani, FR. Widjasena, B. Kurniawan, B. 2016. Analisis Implementasi Manajemen Pelatihan Kesiapan Petugas Tanggap Darurat Dalam Menghadapi Bencana Gempa Bumi Pada Gedung Instalasi Rawat Inap I (Irna I) Di RSUP Dr. Sardjito Yogyakarta. Jurnal Kesehatan Masyarakat (e-Journal) Volume 4, Nomor 4, Oktober 2016 (ISSN: 2356-3346).

Irfanto, R., & Andry, J. F. (2017). Perancangan enterprise architecture menggunakan Zachman framework (studi kasus: pt. vivamas Adipratama) [Enterprise architecture design using the Zachman framework (case study: pt. vivamas Adipratama)]. Prosiding Semnastek.

K. Surendro, "Pemanfaatan Enterprise Architecture Planning untuk Perencanaan Strategis Sistem Informasi," J. Inform., vol. 8, no. 1, pp. 1-9, 2007.

Marini, S., & Sarwindah, S. (2019). Model Arsitektur Enterprise Menggunakan Enterprise Architecture Planning (Eap) [Enterprise Architecture Model Using Enterprise Architecture Planning (Eap)]. JSiI (Jurnal Sistem Informasi), 6(2), 92-97.

Rosida (2014). Perencanaan Architectur Enterprise Menggunakan Zachman Framework (Studi kasus: PT PLN (Persero) Pusat Pemeliharaan Ketenagalistrikan). Jurnal Informasi.

Riani, M. R., & Wati, R. (2020). Implementasi Software Myob Accounting V16 dalam Pengelolaan Data Keuangan Perusahaan (Studi Kasus PT ICSM Indonesia). 18(1), 9-15.

Surendro, K. 2009. Pengembangan Rencana Induk Sistem Informasi. Bandung: Penerbit Informatika.

Spewak SH, Hill SC. 1992. Developing Blueprint for Data, Application, Technology: Enterprise Architecture Planning. New York (US): John Wiley & Sons.

Sopiah, N., & Agustina, E. P. (2018). Penggunaan Metode Web Engineering dalam Aplikasi Penjualan Kain Khas Palembang. Jurnal Ilmiah Matrik, 20(2), 109-118.

S. Bambang Widodo, "Pengembangan Blueprint It dengan Zachman Framework di STP Trisakti," J. Sist. Inf. (Journal Inf. Syst. 1/13 (2017), 49-66 DOI http//dx.doi.org/10.21609/jsi.v13i1.528, vol. 12, pp. 82-89, 2016.

Slameto, A. A., Utami, E., & Pangera, A. A. (2017). Analisis dan Desain Arsitektur Enterprise Sistem Informasi Pelaporan Kerusakan Komputer dengan Zachman Framework. Respati, 7(21).

T. Kristanto, "Enterprise Architecture Planning untuk Proses Pengelolaan Manajemen Aset dengan Zachman Framework [Enterprise Architecture Planning for Asset Management Process Using Zachman Framework]," Regist. J. Ilm. Teknol. Sist. Inf., vol. 2, no. 2, p. 98, 2016.

Tannady, H., Ivgantius, T. Z., Andreas, T. J., & Felix, F. (2021). Perancangan Enterprise Architecture Menggunakan Zachman Framework Pada Perusahaan Jewelry. JBASE-Journal of Business and Audit Information Systems, 4(1).

Trisminingsih, R., & Putra, S. N. (2017). Perancangan Arsitektur Enterprise untuk Koperasi Pertanian Menggunakan Enterprise Architecture Planning. Jurnal Sistem Informasi, 9(1).