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Integrated Enterprise Architecture Blueprint for PT Indomarco Prismatama using the TOGAF ADM Framework

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Abstract

The rapid development of the modern retail industry demands an integrated and adaptive information system to support operational efficiency and strategic decision-making. PT Indomarco Prismatama (Indomaret), as a leading national retail company, faces challenges in managing data, application integration, and business process optimization. This study aims to design an Enterprise Architecture using the TOGAF ADM framework to build a structured and future-ready information system. The research follows the TOGAF ADM phases, including Architecture Vision, Business, Application, Data, and Technology Architecture. Supporting tools such as UML diagrams (Use Case, Activity, Class, and Sequence) are used to visualize business processes and system interactions. The result is a blueprint that outlines both the current state and the proposed target architecture, featuring data integration through a centralized data warehouse, analytical dashboards (e.g., Power BI), and improvements in transaction, distribution, and inventory systems. This architectural design serves as a strategic guide for PT Indomarco Prismatama in implementing a responsive and efficient digital transformation aligned with the company's long-term goals.

Keywords: Enterprise Architecture, TOGAF ADM, Information System, UML, Retail, Indomaret

1. Introduction

PT Indomarco Prismatama, known as the operator of the Indomaret retail network, is one of the largest distribution and trading companies in Indonesia, operating more than 20,000 outlets across the country. Along with its business growth and increasing customer demand for fast and accurate service, the company faces significant challenges in integrating its information systems, managing data, and aligning business strategies with information technology (IT). In its daily operations, PT Indomarco Prismatama manages various systems, ranging from inventory management, logistics, transaction processing, to digital services such as the Klik Indomaret application. However, these systems often operate in silos and are not fully integrated, leading to data duplication, delayed information synchronization, and inefficiencies in managerial decision-making.

A previous study by indicates that although the Klik Indomaret service has improved customer convenience in online shopping, it still encounters several technical issues such as delays in stock updates, suboptimal integration between the front-end and back-end systems, and the absence of a standardized and comprehensive IT service management framework [1]. These issues disrupt the ordering process and pose a risk to customer satisfaction. In addition, research by Atha Apsari and Takaya reveals that Indomaret's inventory management system, although supported by IT, still struggles to respond to market demand fluctuations and does not yet fully support end-to-end supply chain optimization [2]. This indicates that despite the adoption of various IT solutions, PT Indomarco Prismatama lacks a comprehensive enterprise architecture framework that can harmoniously integrate all system components.

The core issue faced by the company is the absence of an Enterprise Architecture (EA) approach that serves as a strategic roadmap to align business processes with technology needs. The Open Group Architecture Framework (TOGAF) is one of the most widely adopted EA frameworks globally and is highly relevant for addressing these challenges. TOGAF provides a structured method for architecture development through its Architecture Development Method (ADM), which covers the entire planning lifecycle—from preliminary phase, architecture vision, business architecture, information systems, technology architecture, to implementation planning and governance. In the

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Indonesian context, the implementation of TOGAF has proven effective in several large enterprises. One such example is a study by Ismi Azhary on PT Industri Telekomunikasi Indonesia (INTI), which demonstrated that using TOGAF reduced data redundancy, improved system integration efficiency, and resulted in a more structured and sustainable IT development roadmap [3].

Enterprise Architecture (EA) is a framework that aligns business strategies with an organization's information technology systems in a structured and integrated manner. The concept of EA aims to provide guidance in managing the complexity of IT systems within large organizations by mapping out key components such as business architecture, data, applications, and technology. In practice, EA serves as a tool for digital transformation planning, business process efficiency, and cross-departmental integration. Previous study shows that consistent implementation of EA can improve the conformity of IT projects with organizational goals and reduce the gap between the existing and target conditions [4]. Meanwhile, Azhary states that the EA framework applied using the TOGAF approach in state-owned enterprises in Indonesia can produce a comprehensive blueprint of information systems, reduce data redundancy, and develop a measurable transformation roadmap [3]. Another study found that, the design of EA in educational institutions shows that the EA approach can integrate fragmented academic systems into a centralized, efficient, and manageable system [5]. Therefore, EA is not merely a technical tool but also a strategic instrument to ensure organizational sustainability and competitiveness in the digital era.

TOGAF (The Open Group Architecture Framework) is one of the most widely used Enterprise Architecture (EA) frameworks in the world. Within TOGAF lies an architectural development method known as the Architecture Development Method (ADM). ADM is an iterative process framework consisting of nine phases: Preliminary, Architecture Vision, Business Architecture, Information Systems Architecture, Technology Architecture, Opportunities and Solutions, Migration Planning, Implementation Governance, and Architecture Change Management. TOGAF ADM provides a systematic guide for designing, managing, and developing enterprise architecture from the initial phase through implementation and change management. In a previous study, the TOGAF ADM method was used to design a public service blueprint in the government sector and was proven effective in producing a structured system architecture that meets organizational needs [6]. Soraya and Sari also demonstrated the effectiveness of TOGAF ADM in designing procurement and production information systems in the manufacturing sector, resulting in a realistic and long-term implementation roadmap [7]. In the academic domain, TOGAF ADM applied to develop EA within a university setting, playing a crucial role in planning the integration of IT-based academic services [8]. Furthermore, a literature study highlighted the main challenges faced by organizations in implementing TOGAF, such as uneven understanding of each ADM phase and the lack of guidance during artifact development [9]. Therefore, TOGAF ADM is not merely a technical tool but a comprehensive managerial approach for transforming organizational architecture, particularly for large companies like PT Indomarco Prismatama, which face the complexity of widespread business processes and information systems.

Considering the high operational complexity of PT Indomarco Prismatama, the involvement of multiple stakeholders, and competitive pressure from the digital retail market, the development of a comprehensive and structured EA is urgently needed. By applying the TOGAF ADM approach, the company can develop a more adaptive business architecture, design integrated information systems, and plan a phased digital transformation aligned with strategic organizational goals. This architectural design can also assist the company in identifying gaps between the current and target states, as well as formulating effective migration and change management strategies. Therefore, this paper aims to design a TOGAF-based Enterprise Architecture for PT Indomarco Prismatama to improve system integration, operational efficiency, and the company's competitive advantage in the era of digital transformation

2. Method

This research is a descriptive qualitative study aimed at illustrating the existing condition of the information system architecture at PT Indomarco Prismatama and designing an integrated Enterprise Architecture (EA) blueprint using the TOGAF ADM (Architecture Development Method) framework. This approach is chosen because the research focuses more on the process of exploration, mapping, and comprehensive modeling of system architecture, rather than hypothesis testing or statistical analysis. This study also falls under the category of a case study, as it is conducted in-depth on a specific object, namely PT Indomarco Prismatama. This research was conducted at PT Indomarco Prismatama (Indomaret Group), specifically within the division that manages digital-based logistics information systems and customer service. The research period lasted for one month, from June 20 to July 20, 2025. The selection of this location and object was based on the consideration that the company has a high level of information system

complexity and has shown the need to align its business processes with technology through the Enterprise Architecture approach.

The data sources in this research consist of two types: (a) Primary Data, obtained through direct interviews with personnel involved in managing the company's IT systems and operations. The interviews were conducted using a semi-structured approach to gather information related to system requirements, business processes, challenges encountered, and expectations for architectural development. (b) Secondary Data, collected through the review of internal company documents (such as SOPs, system diagrams, operational reports, and current architectural documentation), as well as literature studies from academic journals, articles, and official TOGAF standards. The data collection techniques used include participatory observation of key business processes, documentation of existing information systems, and literature studies from relevant academic sources.

Data analysis was conducted using a qualitative descriptive approach, in which the collected data was systematically analyzed to identify patterns, structures, and relationships among the components within the system. The analysis process was carried out through several stages: (a) identification of Existing Conditions: Mapping the current state of the company's information systems, including business architecture, data, applications, and IT infrastructure, (b) Gap Analysis: Comparing the current conditions with the ideal target architecture based on the TOGAF framework to identify gaps or deficiencies in the existing system, (c) Architecture Blueprint Design: Developing the target architecture blueprint based on the analysis results, taking into account the components in each phase of the TOGAF ADM, and (d) implementation Roadmap Development: Formulating a step-by-step implementation plan for the system architecture based on organizational priorities and strategic needs.

In this study, several tools were utilized to support the analysis and design process of the Enterprise Architecture. The selection of these tools was aligned with the methodological needs of the TOGAF ADM framework and served to facilitate effective documentation and system visualization. The tools employed include: (a) UML Tools (Draw.io, Lucidchart). These tools were used to create various architecture diagrams such as Use Case Diagrams, Activity Diagrams, Class Diagrams, and Sequence Diagrams. These visual models help illustrate business processes, data structures, and interactions among system components. (b) TOGAF ADM Framework, this framework served as the primary methodological guide for analyzing and designing the enterprise architecture in a structured manner, from the initial planning phases to architecture change management. (c) Microsoft Excel and Word, Excel was utilized for compiling gap analyses, system requirement lists, and implementation roadmaps, while Word was used to document interview results, field observations, and the overall research report. (d) Scientific Literature, Peer-reviewed journals (indexed in Scopus, SINTA 1, and SINTA 2) were referenced to support the analysis in each TOGAF ADM phase. These sources also served to validate and reinforce the architectural design being developed with the support of these tools, the architectural design process could be carried out systematically, well-documented, and in accordance with best practices in enterprise-scale information system development

3. Results

3.1. Architecture Layer Overview

This diagram visualizes the overall enterprise architecture structure of PT Indomarco Prismatama, consisting of four main layers in accordance with the TOGAF framework: Business Architecture, Application Architecture, Data Architecture, and Technology Architecture.

a) The Business layer includes core processes such as procurement and distribution of goods, store operations, and customer service.
b) The Application layer consists of systems like POS, ordering applications, central monitoring dashboards, and procurement systems.
c) The Data layer includes transaction data, inventory, supplier information, and customer loyalty data.

The Technology layer encompasses end-user devices (POS terminals, scanners), service platforms (central and branch servers), and network infrastructure (VPN, cloud, internet).

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This diagram in **Fig. 1.** was created during the Architecture Vision phase and further developed throughout the subsequent TOGAF architecture phases. As explained by Sitorus and Nugroho, the use of a layered structure in Enterprise Architecture facilitates the analysis of interrelated components and supports the step-by-step integration plan across layers[10]. This diagram also provides a comprehensive overview to management in understanding the connection between business strategy and the supporting technology systems.

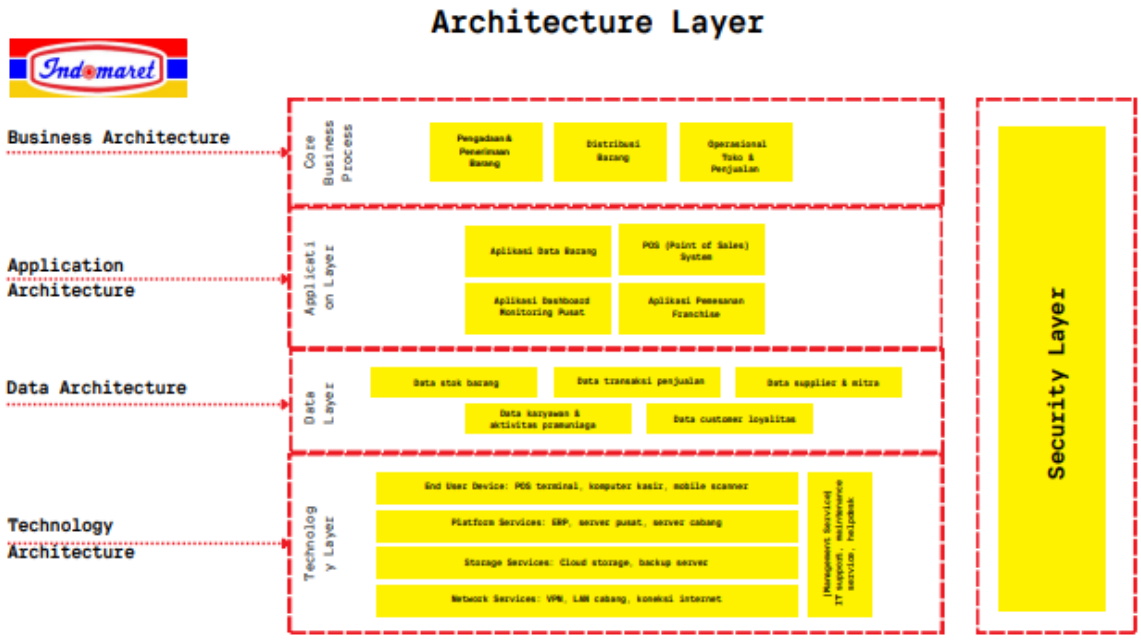

Fig. 1. Architecture Layers

3.2. Diagram Current State Application Architecture

This diagram in **Fig. 2.** illustrates the current state of application integration at PT Indomarco Prismatama. Core applications such as the Point of Sales (POS) system, goods ordering application, central monitoring system, and procurement system operate independently, with only partial digitalization across certain processes. Most application integrations are still performed manually, resulting in delayed data synchronization and low operational efficiency. In the context of TOGAF ADM, this diagram was developed during the Baseline Application Architecture phase to identify existing applications, the flow of communication between them, and the extent of automation implemented. According to Widiatmoko and Wibowo, mapping the current application architecture is crucial to avoid system duplication and serves as a foundation for designing a more optimized target architecture[11], [12]. By visualizing the current manually integrated workflows, the company can identify priority areas for digital transformation initiatives.

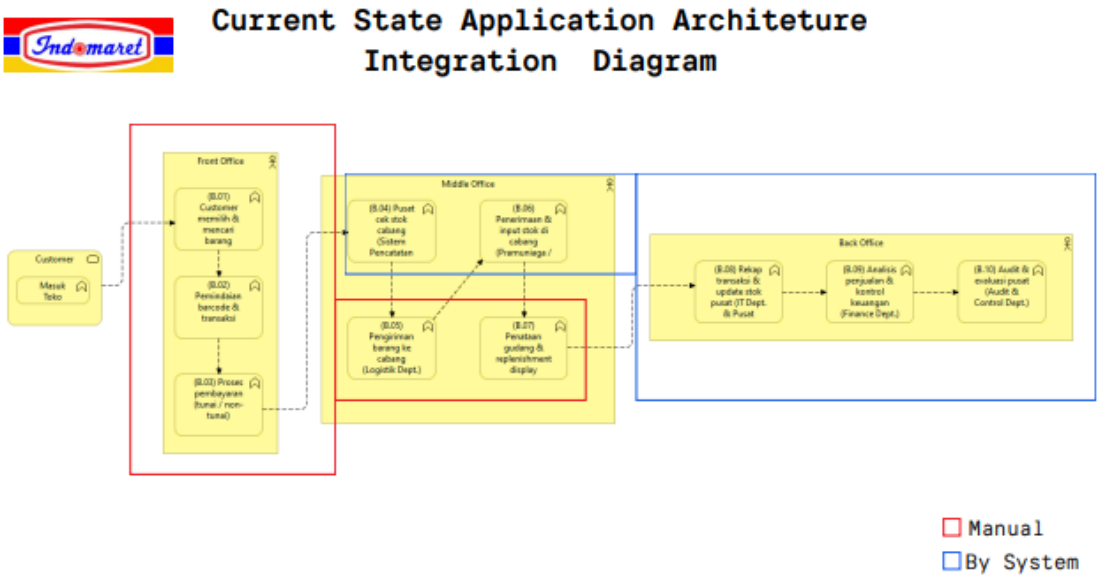

Fig. 2. Current State Application Architecture Integration Diagram

3.3. Diagram Target State Application Architecture

This diagram **Fig. 3.** represents the outcome of the Target Application Architecture phase within the TOGAF ADM framework. In the target condition, all operational applications such as the Point of Sale (POS) system, monitoring dashboards, franchise ordering applications, and procurement systems are designed to be integrated within a unified application ecosystem, enabling seamless communication through middleware or a service bus. The primary goal of this target application architecture is to enhance process efficiency, minimize data synchronization delays, and simplify centralized system management. The design of an integrated application architecture can significantly reduce operational costs, accelerate service response times, and improve overall data quality[13]. The diagram also reflects a modular and service-oriented architecture (SOA) approach, which enables the system to be developed and scaled flexibly in alignment with evolving business requirements.

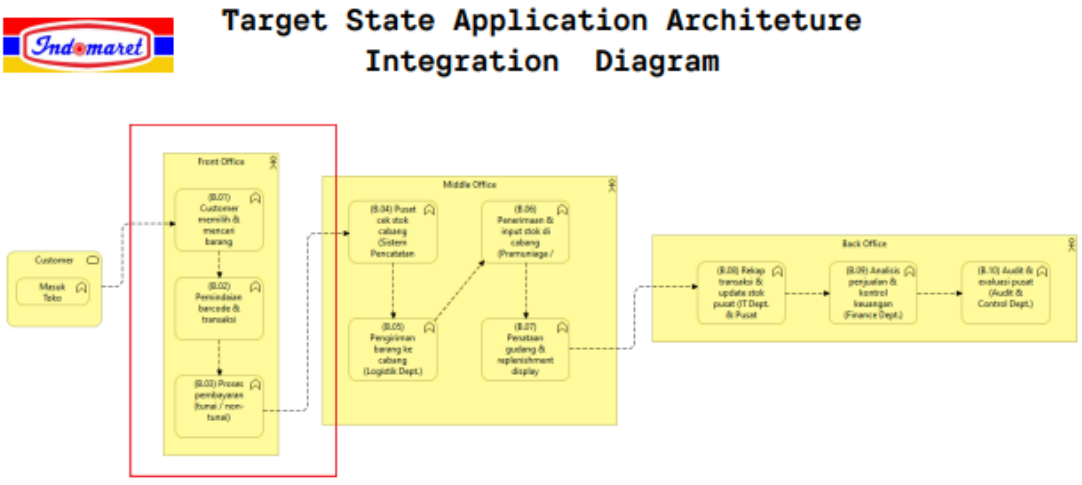

Fig. 3. Target State Application Architecture Integration Diagram

3.4. Diagram Current State Data Architecture

This diagram **Fig. 4.** illustrates the current state of data management and flow within PT Indomarco Prismatama. Data such as inventory stock, sales transactions, customer information, and supplier records are still managed separately

based on their respective application systems. This separation leads to data duplication, redundancy, and a high risk of inconsistency across databases. Within the Baseline Data Architecture phase of the TOGAF ADM framework, it is essential to identify the primary data sources, storage structures, and data movement across applications. According to Putri and Maulana, identifying the existing data architecture serves as a critical foundation for information system transformation, especially in designing a unified data model that can be utilized across organizational functions[14]. This mapping process also highlights the need for improved data governance to enable effective data-driven decision-making.

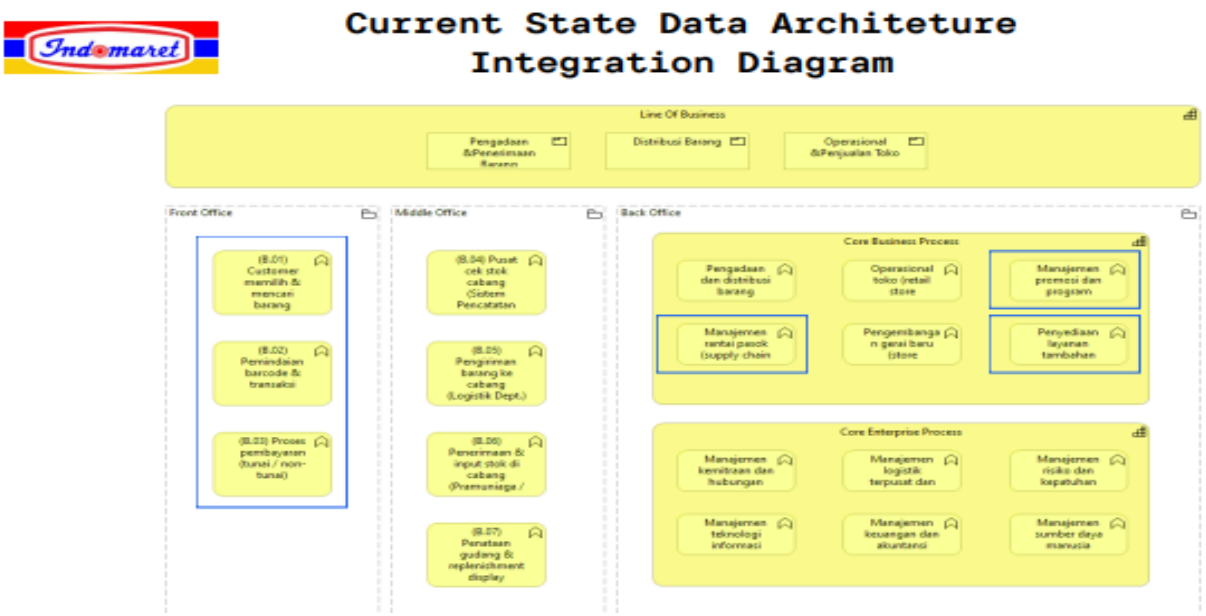

Fig. 4. Current State Data Architecture Integration Diagram

3.5. Use Case Diagram

a) The Use Case Diagram in **Fig. 5.** is a component of the Unified Modeling Language (UML) modeling framework, which serves to illustrate interactions between users (actors) and the system based on its core functional processes. This diagram plays a critical role in the early stages of system design, as it simplifies complex functional requirements into a visual representation that is easily understood by both technical and non-technical stakeholders. In the Use Case Diagram of PT Indomarco Prismatama (Indomaret), four primary actors are involved: Head Office, Store Staff (Pramuniaga), Cashier, and Customer. Each actor interacts with the system through specific use cases that represent actual business processes.

b) The Head Office is involved in the Stock Management process, which has an <<extend>> relationship to the Shipping process—indicating that managing stock includes the optional task of delivering goods to branch stores.

c) The Customer interacts through three main use cases: Searching for Products, Selecting Products, and Placing Orders. The Selecting Products use case includes (<<include>>) the Placing Orders process, showing that ordering cannot occur without first selecting a product.

d) The Store Staff is responsible for in-store activities such as Receiving Goods, Updating Stock, Displaying Products, and Printing Barcodes. These processes reflect the flow of goods from reception to shelf display, including barcode generation.

e) The Cashier handles the final transaction stage, including Receiving Payments and Printing Receipts, representing the frontliner transaction workflow.

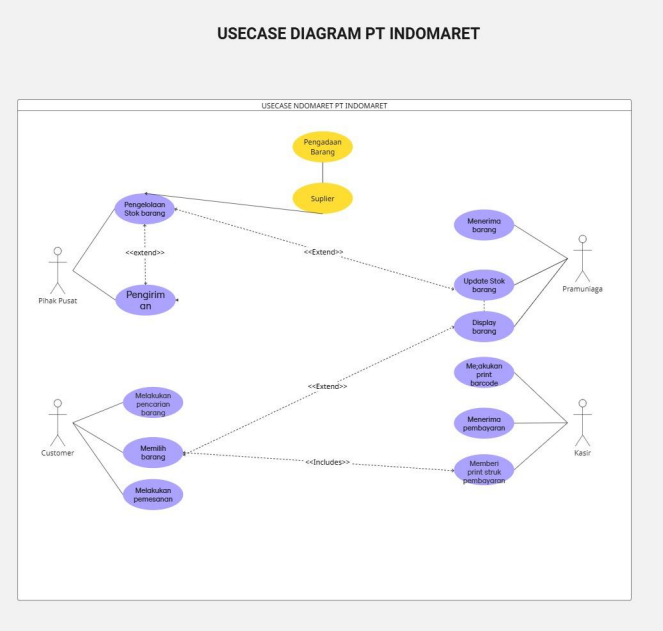

Fig. 5. Use Case Diagram

This diagram portrays the system as an integration medium among various actors in a complex business environment. The relationships among use cases use <<extend>> to illustrate optional or additional activities such as shipping and barcode printing, and <<include>> to indicate functional dependencies between core activities. The use of Use Case Diagrams is highly effective in identifying user requirements and modeling interaction scenarios within complex systems—especially in the retail sector, which involves multiple functional roles such as distribution centers, retail outlets, and customers[15]. Furthermore, Widyanto and Yuliani argue that Use Case Diagrams also assist developers in narrowing the application development scope in a more focused and efficient manner[16]. By utilizing Use Case Diagrams, the company can gain a clearer understanding of system requirements and ensure that field-level business processes are accurately reflected in the enterprise information system design.

3.6. Activity Diagram

An Activity Diagram in **Fig. 6.** is a form of modeling in UML (Unified Modeling Language) that serves to illustrate the flow of activities within a business process or system. This diagram is particularly useful for identifying sequences of work, decision-making conditions, and the involvement of different actors in a single process. In the context of Enterprise Architecture design, the diagram is used in the Business Architecture phase of the TOGAF ADM framework to systematically and structurally map out business processes. The Activity Diagram for PT Indomaret models the flow of purchasing activities involving three main actors: the Customer, the Store Attendant, and the Cashier. The process begins with the customer searching for goods. If the item is difficult to find, the customer may ask for assistance from the store attendant. If the item is located, the process continues to the payment stage; if not, the customer may choose to search for another item or terminate the shopping process. The customer then selects a payment method, either cash or non-cash (such as credit/debit card), while the cashier receives the payment and processes the transaction. If the payment is successful, the system prints a receipt as proof of the transaction, completing the process. This diagram includes several logical branches (decision nodes), such as: Was the item found? Does the customer want to search for another item? What is the chosen payment method? Was the transaction successful? Activity Diagrams play a crucial role in mapping business processes because they capture the complexity and actual workflow involving multiple actors[13]. These diagrams also help in detecting potential bottlenecks or inefficient repetitive tasks. Furthermore, the diagram highlights cross-role collaboration that reflects the real working structure in the field. With the use of swimlanes for each actor, the system can be visualized as a series of collaborative activities operating within an integrated retail service system.

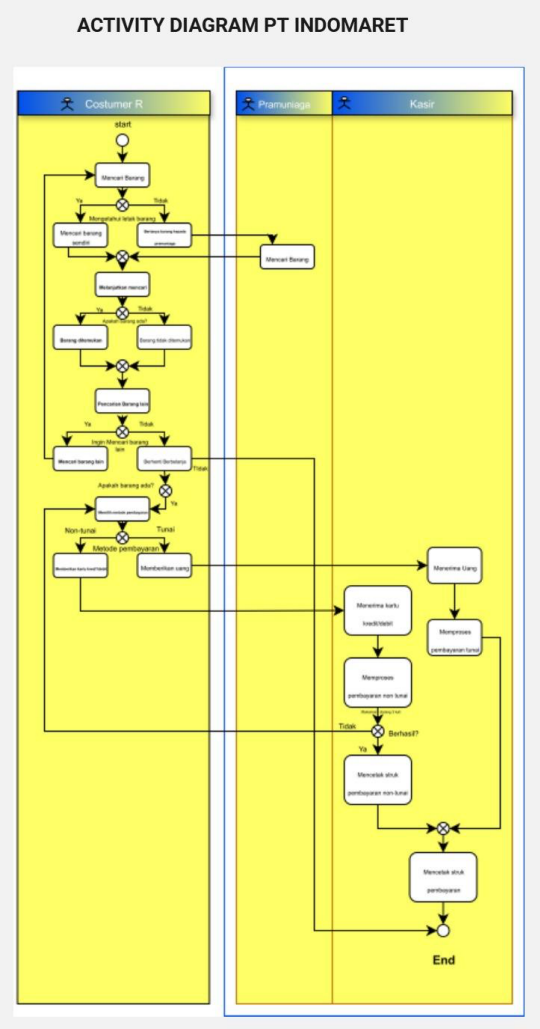

Fig. 6. Activity Diagram

3.7. ERD / Class Diagram

A Class Diagram in **Fig. 7.** is a component of UML modeling used to visualize the structure of a system through entities (classes), attributes, and the relationships between them. This diagram also functions as a representation of an Entity Relationship Diagram (ERD) in the context of database design. In the Information System Architecture phase of TOGAF ADM, the Class Diagram is used to formulate the data structure required by the system and to support integration between application modules. In the Class Diagram for PT Indomaret, several key entities play a crucial role in managing operational data, including:

a) Item Table contains information related to items sold, such as id_barang, nama_barang, kategori, harga_jual, harga_satuan, diskon, and harga_diskon. This entity is central and relates to other entities such as Sales Transactions, Inventory, and Procurement Transactions.
b) Cashier, Store Attendant, and Headquarters Staff, these three entities store employee information along with their user access credentials. Each has identity attributes such as id, nama, useracc, no_hp, and email. The Cashier is directly linked to Sales Transactions, while the Headquarters Staff is related to Procurement Transactions.
c) Sales Transactions, Stores sales data, including id_barang, id_kasir, jumlah, total_harga, and metode_pembayaran. This data is critical for reporting and sales analysis.

d) Inventory, records information on stock quantity and item prices in the warehouse, including harga_normal, jumlah, and tanggal_masuk. It is linked to the Stock Request Transactions for restocking purposes.
e) Procurement Transactions and Stock Requests, these two entities are used to record vendor purchases and stock requests from the central warehouse. They include attributes like jumlah_barang, kapasitas_kapal, supplier, and tanggal_transaksi.

This Class Diagram is designed with clear and well-defined relationships. Relationships between entities, such as foreign keys (FK) and primary keys (PK), are explicitly displayed to support a relational and integrative database design. The Class Diagram is a foundational element in building the data structure of an information system, as it provides the initial blueprint for the database to be developed[11], [12]. This is crucial to ensure data consistency, transaction validity, and inter-entity connectivity. The implementation of a Class Diagram like this also supports more accurate system analysis during the Data Architecture phase in TOGAF ADM and facilitates the development of a modular and extensible system.

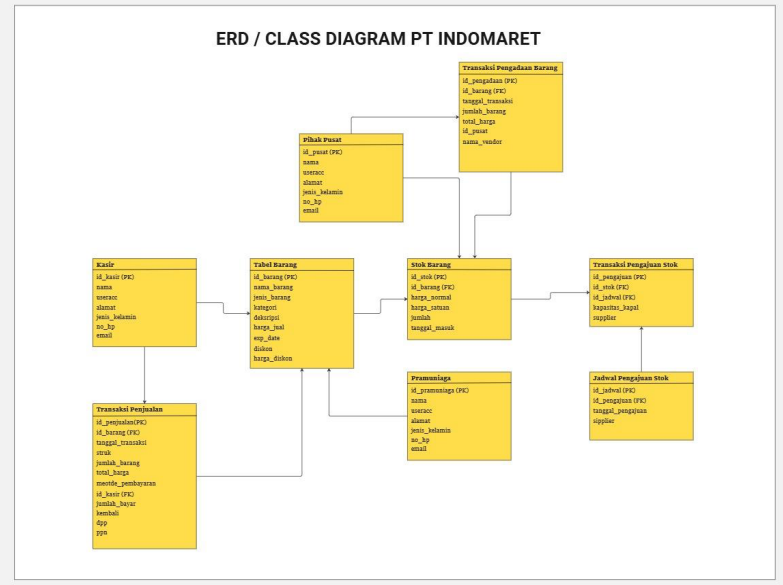

Fig. 7. Entity Relationship Diagram

3.8. Enterprise Architecture Impelementation

This diagram in **Fig. 8.** illustrates the integrated data and system architecture designed to support operational management, analytics, and reporting within PT Indomarco Prismatama (Indomaret). It visualizes how data from various sources are integrated and utilized through the Extract, Transform, Load (ETL) process into a centralized data warehouse, which is then accessed through analytical portals such as Power BI and Tableau.

The enterprise draws on a heterogeneous landscape of operational systems that together capture end-to-end retail activities. Core sources include the POS Transaction Database (recording itemized sales and tender details), Customer & Store Shift Database (customer interactions and operational shift logs), Warehouse & Goods Distribution Database (inventory movements and logistics traces), Product Management Database (master data, pricing, and product hierarchies), Customer & Membership Database (profiles, loyalty events, and segmentation attributes), Employee & Shift Database (rosters, roles, and timekeeping), and Daily Store Report Database (store-level KPIs, anomalies, and narratives). Each database contributes a distinct semantic slice—ranging from high-velocity transactional facts to slowly changing master data—thereby enabling a comprehensive view of sales, customers, supply chain, and workforce operations. This diversity is intentional: it reduces blind spots in downstream analytics while preserving the granularity required for auditability and operational reconciliation.

All source feeds are funneled into a governed ETL pipeline that extracts raw records, applies data quality rules (validation, standardization, deduplication), reconciles keys across domains, and conforms schemas before loading them into a centralized data warehouse. The staging layer isolates ingestion volatility, while transformation layers enforce business logic and harmonize reference data, ensuring metric consistency across reports and models. This

disciplined ETL approach elevates the fitness-for-use of analytical data—improving timeliness, accuracy, comparability, and serves as a keystone for digital transformation and data-driven decision-making in large retail settings[17]. By operationalizing lineage and quality checks, the pipeline underpins trustworthy reporting and repeatable advanced analytics.

Curated, integrated data is exposed through role-aware analytical and administrative portals. Business users access interactive dashboards in platforms such as Power BI and Tableau to monitor performance, diagnose variance, and explore trends via drill-downs and ad-hoc queries. Technical administrators employ PostgreSQL-backed dashboards and management consoles to oversee data loads, validate aggregates, and manage metadata. Access control follows the principle of least privilege with role-based permissions that differentiate operational staff (task-focused views and inputs), store supervisors (tactical monitoring and exception handling), and central administrators (enterprise-wide oversight, data stewardship, and report lifecycle management). The portals also support structured data input/update and controlled report upload/download to close the loop between operations and analytics governance.

The architecture is intentionally integrated with enterprise applications to ensure closed-loop, real-time decision support. SAP Retail anchors core retail and supply-chain processes, while monitoring portals provide operational telemetry for availability, throughput, and incident tracking. EDC/export subsystems standardize electronic transaction extraction for settlement and audits, and export/backup services enforce recoverability, compliance, and business continuity. Aligned with TOGAF's enterprise-wide integration principles, these couplings enable seamless data exchange across business functions and shorten the latency from event to insight to action. Prior work shows that such an integrated data architecture is critical for multi-branch retail organizations: it consolidates dispersed data into a single analytical backbone and strengthens analytics capabilities through modern visualization tools like Power BI and Tableau [18].

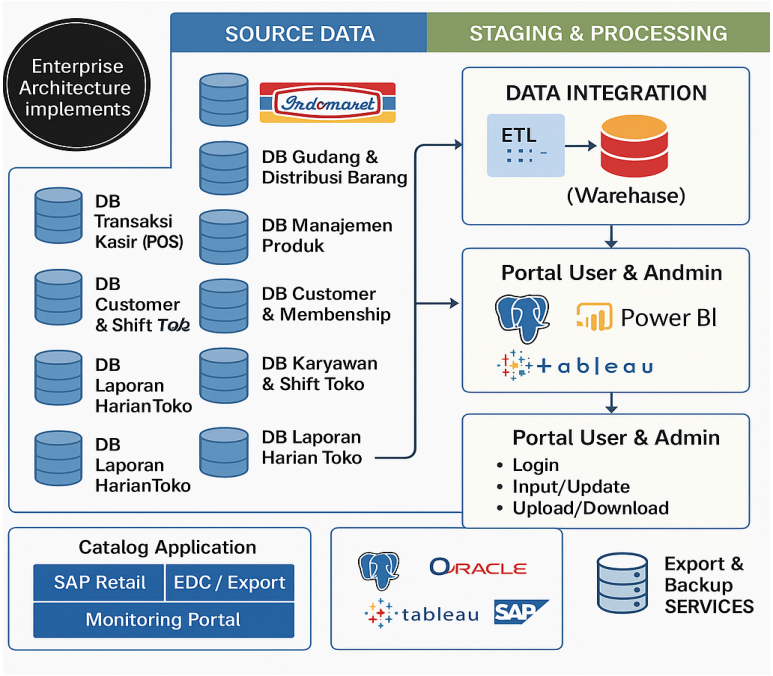

Fig. 8. Archotecure Enterprise Design

4. Conclusion

Based on the results of the research and the Enterprise Architecture (EA) design at PT Indomarco Prismatama using the TOGAF ADM framework, it can be concluded that the need for integrated information systems and structured digital transformation is crucial in supporting large-scale retail business operations. The company's existing systems are still siloed and not fully integrated, leading to inefficiencies, data redundancy, and delays in decision-making. Through the TOGAF ADM approach, this study successfully designed an enterprise architecture blueprint consisting

of four main domains: business architecture, application architecture, data architecture, and technology architecture. Modeling using UML diagrams (Use Case, Activity, Class, and Sequence) also helped enhance the understanding of business process flows and the interaction between systems and actors in a more detailed and visual way. The current state diagram highlights various weaknesses of the existing systems, while the target state architecture offers solutions such as integration through middleware, data consolidation into a data warehouse, and the use of analytics portals like Power BI and Tableau. This design not only improves the structure of the information system but also aligns business processes with the company's strategic goals in a more adaptive and sustainable manner. With this EA design, PT Indomarco Prismatama can develop a more realistic, effective, and measurable digital transformation roadmap. The final outcome of this research is expected to serve as a foundation for building a more modern, flexible IT system that supports the company's competitive advantage in the increasingly dynamic era of retail digitalization.

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