

Implementation of Zachman Framework to Support Business Activities and Performance

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ARTICLE INFO	ABSTRACT
Keywords: Zachman Framework, Business Activities, Business Performance Received: 16 Dec 2023 Accepted: 17 Feb 2024 Published: 28 Feb 2024	PT Suzuki Indomobil Motor (SIM) is a foreign investment company engaged in the business of Component Industry and Assembly of two-wheeled SUZUKI Brand motor vehicles (Motorcycles) and four wheels (Cars) which strives to provide solutions to the needs of transportation for the community by providing the principle of Total Solution, namely by providing the best service to consumers by combining synergies between technology and information systems. Building integrated systems within the company requires very careful and planned planning in order to pay attention to all stakeholders in the company. Planning the entire system including all aspects of the organization and business is what is known as Enterprise Architecture (EA). EA is used to analyze, integrate, and document the architecture in the enterprise. The increasingly effective and efficient utilization of IS and IT supports business activities, achieving One of the frameworks that addresses issues in the development of information systems in the company from various points of view is the Zachman Framework. Increasingly effective and efficient use of information systems (IS) and information technology (IT) that support business activities to achieve organizational goals and services for stakeholders. This goal is expected to be achieved optimally if there is synergy between the SI and IT strategies and the IT strategy.

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1. INTRODUCTION

The use of information technology in companies is able to create advantages in competitive competition and is also the main target of efforts to implement IS/IT in companies. The design development that will be implemented using IS and IT strategies can achieve satisfactory targets. For every company operating in the business sector, of course they hope for profits which will be the turning point they want to achieve (Davinci and Andry, 2020; Lin and Dyck, 2010).

The use of information technology in business makes it easier for every business actor and creates efficiency and effectiveness for the company so that by using information technology the company is able to create a competitive advantage and be able to compete in the global market (Wu et al., 2015; Dereli, 2015). The development of increasingly complex organizations means that the need for information and data will increase (Janssen et al., 2017). To meet these needs, it is necessary to develop an integrated information system that can support business processes running in organizations that provide quality data or information aimed at reducing costs, increasing productivity, providing data and information sharing facilities and improving service to customers.

The importance of data integration in a large-scale company called an enterprise has been widely discussed in various references (Saggi & Jain, 2018; Fosso Wamba & Mishra, 2018). The availability of

well-formatted data, in one well-managed data source is also a goal of organizational development. To make this happen, accurate strategy and planning are needed.

Information technology and its evolution. The idea is that essentials are often stable compared to specific solutions found to address current problems, helping to safeguard the essentials of the business, by allowing for maximum flexibility and adaptivity. In developing Enterprise Architecture, it is necessary to adopt or develop your own EA framework for enterprise architecture. There are various kinds of frameworks that can be used for enterprise architecture development, namely by using the Zachman Framework. Enterprise Architecture or enterprise scale architecture identifies and defines common data types that support business functions defined by the business model (Pereira and Sousa, 2004).

By designing a good enterprise architecture, it is hoped that harmony between information technology and business needs can be achieved which can carry out business processes in accordance with the company's goals and targets. Enterprise architecture describes a plan for developing a system or set of systems (Rouhani et al., 2015). Logical organization of main business processes and information technology (IT) capabilities that reflects the need for integration and standardization of operating models (Rahimi et al., 2016). The main use of enterprise architecture is to inform, guide, and limit decisions for organizations, especially in making information technology investments (Kotusev, 2018).

According to Irfanto & Andry (2017), enterprise architecture can also be used as a way to increase IT efficiency when business innovation is developed by the company. How the implementation of enterprise architecture can be used by organizations, it is best for organizations to adopt a method or framework that can be used in developing the enterprise architecture. So with the enterprise architecture method it is hoped that it can manage complex systems and can align business and IT that will be invested (Yunis & Surendro, 2015).

Enterprise architecture is a method used to build a company architecture, according to Khumaidi et al. (2016), enterprise architecture is a data quality planning approach method that is oriented towards business needs and how to implement the architecture in such a way as to support the turning of business wheels and the achievement of information systems and organizations. The definition of Enterprise Architecture includes the following: 1) Enterprise Architecture is a relevant descriptive representation (model) to describe an enterprise and what must be produced to meet management needs. 2) Enterprise architecture is a definition of a business system with what the business environment should be and can also be a design for managing and operating each business component, for example, policies, operations, infrastructure, information. 3) Enterprise Architecture is a mechanism to ensure that an organization's information technology resources are in line with the organization's strategy (Hazen et al., 2017). From these definitions, enterprise architecture can be used as a reference or guideline when developing information and communication systems because enterprise architecture is a blueprint.

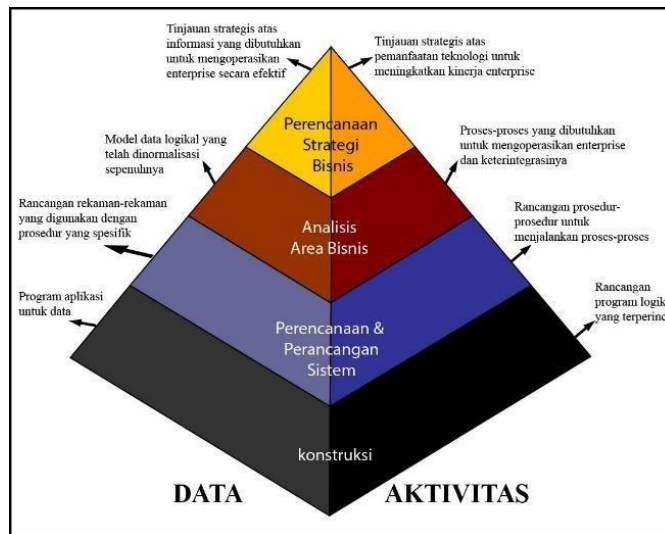


Figure 1. Enterprise Architecture Structure

An image of Enterprise Architecture can be seen in the image above. The Zachman Framework is an Enterprise Architecture framework that provides a way to view and define an enterprise in a formal and well-structured manner. This framework consists of a two-dimensional classification matrix which is built from a combination of several general questions, namely What, Where, When, Why, Who and How (Iyamu, 2018; Lapalme et al., 2016).

- 1) What (data): describes the unity that is considered important in business. These entities are things about which information needs to be maintained.
- 2) How (function): defines functions and activities. Input and output are also considered in this column.
- 3) Where (network): shows the geographic location and relationships between activities in the organization, including the main geographic locations of the business.
- 4) Who (people): represents the people in the organization and the metrics for measuring their abilities and performance.
- 5) When (time): represents time and indicates work criteria. This column is useful for designing schedules and processing architectures.
- 6) Why (motivation): explains the motivation of the organization and its work. Here you can see the goals, objectives, business plans, knowledge architecture, rationale and decision making in the organization.

The Zachman Framework is a scheme for classifying enterprise artifacts. The Zachman Framework consists of 6 columns and 6 rows. Each column represents the focus, abstraction, or topic of enterprise architecture, namely: data, function, network, people, time, and motivation. Each row represents the following perspective:

- 1) Planner's Perspective: establishes context, background, & goals.
- 2) Owner's Perspective: establishes the conceptual model of the enterprise.
- 3) Designer Perspective: establishing an information system model while bridging what the owner wants & what can be realized technically and physically.
- 4) Builder's Perspective: determines the technical & physical design used in supervising technical and physical implementation.
- 5) Subcontractor Perspective: determines the role and reference for the party responsible for developing the information system.
- 6) Functional Perspective: represents the user perspective and real implementation results

ENTERPRISE ARCHITECTURE - A FRAMEWORK™

	DATA	What	FUNCTION	How	NETWORK	Where	PEOPLE	Who	TIME	When	MOTIVATION	Why	
SCOPE (CONTEXTUAL)	List of Things Important to the Business		List of Processes in which the Business Performs		List of Locations in which the Business Operates		List of Organizations Important to the Business		List of Events Significant to the Business		List of Business Goals/Strat		SCOPE (CONTEXTUAL)
Planner	Entity = Class of Business Thing		Function = Class of Business Process		Node = Major Business Location		People = Major Organizations		Time = Major Business Event		End Means = Major Bus. Goal/Critical Success Factor		Planner
ENTERPRISE MODEL (CONCEPTUAL)	e.g. Semantic Model		e.g. Business Process Model		e.g. Business Logistics System		e.g. Work Flow Model		e.g. Master Schedule		e.g. Business Plan		ENTERPRISE MODEL (CONCEPTUAL)
Owner	Ent = Business Entity Reln = Business Relationship		Proc = Business Process IO = User Views		Node = Business Location Link = Business Linkage		People = Organization Unit Work = Work Product		Time = Business Event Cycle = Business Cycle		Ent = Business Object Means = Business Strategy		Owner
SYSTEM MODEL (LOGICAL)	e.g. Logical Data Model		e.g. Application Architecture		e.g. Distributed System Architecture		e.g. Human Interface Architecture		e.g. Processing Structure		e.g. Business Rule Model		SYSTEM MODEL (LOGICAL)
Designer	Ent = Data Entity Reln = Data Relationship		Proc = Application Function IO = Data Element		Node = IT System (Process, Resource, etc.) Link = Line Characteristic		People = Role Work = Deliverable		Time = System Event Cycle = Processing Cycle		Ent = Business Object Means = Action		Designer
TECHNOLOGY MODEL (PHYSICAL)	e.g. Physical Data Model		e.g. System Design		e.g. Technology Architecture		e.g. Presentation Architecture		e.g. Control Structure		e.g. Rule Design		TECHNOLOGY MODEL (PHYSICAL)
Builder	Ent = Segment/Tables Reln = Pointer/Query		Proc = Computer Function IO = Data Element/Set		Node = Hardware/System Software Link = Line Specifications		People = User Work = Screen Format		Time = Execute Cycle = Component Cycle		Ent = Condition Means = Action		Builder
DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)	e.g. Data Definition		e.g. Program		e.g. Network Architecture		e.g. Security Architecture		e.g. Timing Definition		e.g. Rule Specification		DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)
Sub-Contractor	Ent = Data Reln = Address		Proc = Language/Script IO = Control Block		Node = Addresses Link = Protocols		People = Identity Work = Job		Time = Interval Cycle = Machine Cycle		Ent = Sub-condition Means = Step		Sub-Contractor
FUNCTIONING ENTERPRISE	e.g. DATA		e.g. FUNCTION		e.g. NETWORK		e.g. ORGANIZATION		e.g. SCHEDULE		e.g. STRATEGY		FUNCTIONING ENTERPRISE

Figure 2. Enterprise Architecture Framework

provides a structured matrix combining six interrogatives (What, How, Where, Who, When, Why) and six abstraction levels to holistically represent an organization. This approach ensures that business processes, data, technology, and people are aligned systematically. When integrated with the Value Chain Model, it enables organizations to map activities into primary and support functions, ensuring that each process adds value and supports strategic goals, thereby strengthening the alignment between IT and business functions

Value Chain Model: The function of the value chain is to describe how to view business as a chain of activities that can convert input into output so that it has value for customers. The Value Chain provides a framework for identifying and inventorying business function areas, namely by grouping functional areas into:

- 1) Primary Activities, as follows:
 - a. Inbound logistics: activities related to receiving, storing and disseminating input.
 - b. Operations: activities that transform input into output into final products.
 - c. Outbound logistics: activities related to distributing products/services to customers.
 - d. Marketing and sales: activities related to marketing and sales such as promotions and so on.
 - e. Service: activities related to service providers to improve product maintenance such as training, repair and maintenance.
- 2) Support activities are as follows:
 - a. Company infrastructure (firm infrastructure): activities related to costs and assets related to general management, accounting and finance, security and safety of information systems and other functions.
 - b. Human resources management: activities related to development, training and compensation for all individuals and developing employee skill levels.
 - c. Technology development: activities related to costs related to products, improvements, processes, equipment design, development of computer software, telecommunications systems, new database capabilities and development of computer-based system support.
 - d. Procurement: activities related to how resources are obtained such as the function of purchasing inputs used in the organization's value chain.

Enterprise Architecture Planning EAP is a method used to build an information architecture in which a data quality planning approach is oriented to business needs and how to implement the architecture in such a way as to support the turning of business wheels and the achievement of information system and organizational content. However, EAP does not design the business and its architecture, but defines the business and architectural requirements. In EAP, architecture explains the

data, applications and technology needed to support the organization's business (Gunawan et al., 2021).

- 1) Layer 1 (Starting position)
Planning Initiation: starting Enterprise Architecture Planning on the right track (including: determining the methodology used, who will be involved, the toolset needed). At this stage a work plan will be produced, ensuring management commitment.
- 2) Layer 2 (Current position)
 - a. Business modeling: gathering knowledge about business and information used in running a business.
 - b. Current systems and technology: determine current systems and technology as a basis for long-term migration plans.
- 3) Layer 3 (Where we want to be in the future)
 - a. Data architecture: determines the main types of data needed to run the business
 - b. Application Architecture: defines the main types of applications needed to manage data and support business functions.
 - c. Technology architecture: determines the technology platforms required to provide an environment for applications that manage data and support business functions.
- 4) Layer 4 (How to get there) Deployment plan: define application deployment stages, deployment schedule, and propose a clear path to migrate from current position to desired future position.

2. METHODS

The methodology used in creating this research design is using the Enterprise Architecture (EA) methodology with the Zachman framework method as a tool for the documentation process (Supriadi and Amalia, 2019), as well as literature studies as a reference for obtaining a process design including several methods, as follows:

- 1) Literature search, namely research carried out by exploring relevant libraries related to the research topic being studied.
- 2) Direct observation carried out at the location (observation) in order to see directly the processes that occur during production related to the material needed in preparing research such as studying documentation.

In this research, the steps refer to the methodology of Enterprise Architecture Planning (EAP) . The steps that must be taken so that the research can run well are:

- 1) Review of the Current Condition of the Enterprise
 - a. Business process modeling
In the business process modeling step, identification and documentation of the organizational structure is carried out, identification and definition of business functions by creating an initial business model and then relating business functions to units in order to understand each unit's responsibilities for a function.
 - b. Current systems and technology
This step includes identifying the systems and technology currently used by the enterprise by collecting system and technology data, documenting all the basic systems and technology currently used by the enterprise.
- 2) Architectural Design
 - a. Data Architecture
This activity includes identifying and defining the data entities needed for the enterprise to support business functions.
 - b. Application Architecture
This activity includes identifying and defining the applications needed to manage data and

support enterprise business functions.

c. Technology Architecture

This activity includes identifying and defining the technological principles needed in an enterprise to manage data so that business functions can run well.

3. RESULTS AND DISCUSSION

As the initial stage of the EAP methodology; Initialization of system planning defines the organization as a research object related to the vision of information system planning, scope and objectives (Lee and Gough, 1993), with the hope that the information architecture development carried out can be in accordance with the core business processes undertaken by the company which consists of three steps, namely:

1) Process of defining the scope and means of EAP

- a. Input aspect: input aspect includes the stock report process, production activity reports.
- b. Process aspect: in this aspect the focus is the motor vehicle production process.
- c. Output aspect: results in the form of motorized vehicles which are distributed to motorbike dealers and product quality is monitored, and testing is carried out so that consumers can safely use the product.

2) System and Application Integration

- a. Initialization of planning.
- b. Current business models and technology.
- c. Data architecture, applications and technology.
- d. Implementation.

The business process in the image below which is depicted using Value Chain is a process that exists to formulate a list of existing business processes to define the functions that exist in each business process which will be modeled in the form of a business process .



Figure 3. Value Chain

The following is an explanation of the analysis results using the Zachman Framework method:

3.1 What

Kolom What mengenai data yang ada pada PT. Suzuki Indomobil Motor.

Scope:

This section will describe the entities that play a role in motor vehicle production. The parsing is done textually.

- 1) Leadership
- 2) Warehouse Manager
- 3) Production Manager
- 4) Dealers
- 5) Finance

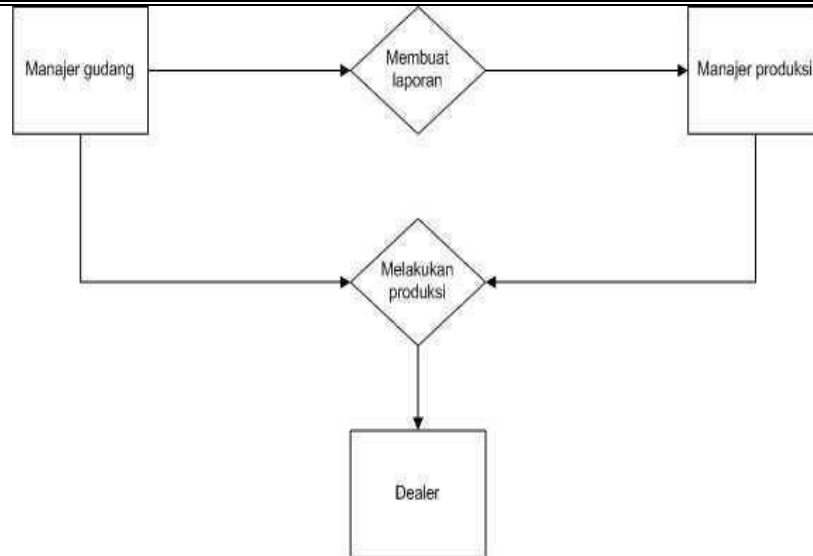


Figure 4. Entities in the Production Process

3.2 How

The How column discusses the processes that occur in the motor vehicle production system.

1) Scope:

The main processes that occur in motor vehicle production. Motor vehicle production system. The following are the procedures carried out in the system: The first step taken is reporting from each dealer that they need motor vehicle stock.

2) Required documents:

- Reports from motorbike dealers to the warehouse manager containing the remaining stock of motorbikes.
- The warehouse manager makes a report on the production process to the production manager at the production site. The production manager prepares spare parts for the motor vehicle production process.

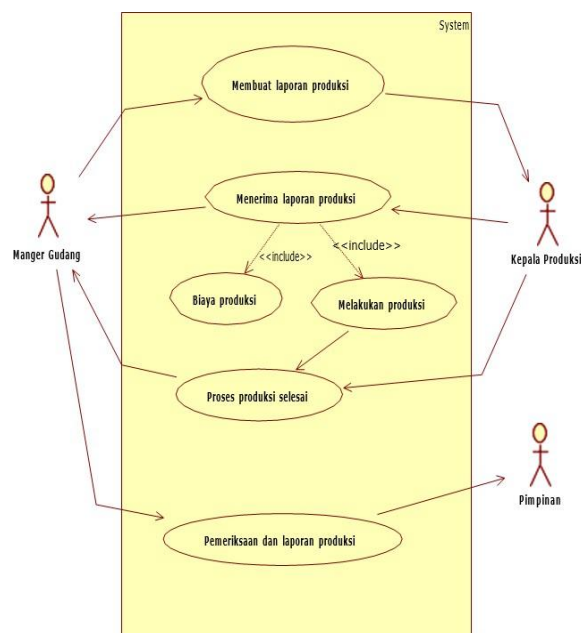




Figure 5. Work Scheme

3.3 Where

Pada kolom Where akan dibahas lokasi yang digunakan untuk pengembangan. lokasi bisnis utama yaitu lokasi dimana perakitan kendaraan roda dua dilakukan.

- 1) Scope
- 2) Enterprise Model
- 3) System Model

Mengembangkan site link topologi atau skenario jaringan PT. Suzuki Indomobil Motor.

3.4 Who

The Who column will discuss human resources who play an important role in the two-wheeled vehicle production process.

Scope:

The following is a list of organizational units that play a role in the motor vehicle production system.

- 1) Leadership
Monitor all activities at PT. Suzuki Indomobil Motor.
- 2) Warehouse Manager
Carry out activities where all vehicle availability for sales is carried out.
- 3) Production Manager
Carrying out the production process of motorized vehicles for distribution to dealers.

3.5 When

In the When column, the main activities that occur within PT will be discussed. Suzuki Indomobil Motor.

Scope:

This section will discuss a list of the main activities that occur in vehicle production globally, namely:

- 1) Stock report from dealer.
- 2) Making reports for vehicle production by the warehouse manager.
- 3) Receiving production reports by the production manager.
- 4) The production process is carried out by the production manager.
- 5) Vehicle production has been completed.
- 6) Distribution of motorized vehicles to dealers.

This section explains the entire process in the scope section, namely:

- 1) Stock report from dealer.
- 2) Making reports for vehicle production by the warehouse manager.
- 3) Receiving production reports by the production manager.
- 4) The production process is carried out by the production manager.
- 5) Vehicle production has been completed.
- 6) Distribution of motorized vehicles to dealers.

3.6 Why

In the Why column, PT's long-term plans will be discussed. Suzuki Indomobil Motor. This long-term plan includes the company's vision and mission and creates a work environment that is fun, creative, productive and object-oriented.

Scope:

PT. Suzuki Indomobil Motor has a high orientation towards business, where the entire process pays attention to the comfort and quality of the products and services produced to customers is high and satisfying.

4. CONCLUSION

Conclusions from the results and discussions that have been carried out using the Zachman Framework method can be concluded, namely: 1) Enterprise Architecture is needed so that companies have a standard information architecture. 2) The benefits of Enterprise Architecture are as a basis for developing information systems. 3) The Zachman Framework is an enterprise architecture framework that provides a way to view and define a running enterprise so that it is more structured and integrated with IT development. 4) Enterprise information architecture will be a reference for long-term technology investment by considering the company's interests.

Meanwhile, suggestions that can be given so that business processes run smoothly are: 1) Creating an enterprise architecture that can support policy strategies in planning system development and presenting documentation. 2) The Enterprise Architecture model that has been produced can be used as a strategic target for the company in improving business processes. 3) The Zachman framework is an enterprise architecture framework that provides a way to view and define an enterprise in a formal and well-structured manner, for the availability of data documentation, systems and technology that supports business processes with IT development.

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