Indonesian Journal of Enterprise Architecture
P-ISSN: 3035-6410; E-ISSN: 3035-6402
Journal Homepage: http://journal.lontaradigitech.com/IJEA

Implementation of Enterprise Architecture Zachman Framework at PT. Shopee Internasional Indonesia (Shopee Application)

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ARTICLE INFO

Keywords: Information architecture; Information technology; Zachman Framework.

Received: 19 Jun 2023
Accepted: 18 Agu 2023
Published: 31 Agu 2023

ABSTRACT

The development of information technology and increasingly fierce competition in business life requires companies to have a strong and efficient information architecture to optimize their business. The framework that can be used to develop information architecture is the Zachman Framework. The purpose of this research is to examine the implementation of the Zachman Framework in the context of developing information architecture at Shopee. The results showed that the Zachman Framework provides a comprehensive framework for the development of Shopee's information architecture. Elements of the Zachman Framework such as perspectives (who, what, when, where, why, how), objects (data, activities, networks, people, time, motivation), and usage can be used to describe and organize various aspects of an enterprise's information architecture. The implementation of the Zachman Framework helps Shopee design, analyze, and design information systems that suit the company's business needs and strategies.

1. INTRODUCTION

In the rapidly evolving digital era, companies worldwide face challenges in managing the complexity of information technology and ensuring alignment between business objectives and technology infrastructure (Adelia et al., 2020; Pereira & Sousa, 2004). PT Shopee International Indonesia, as one of the leading e-commerce companies in Southeast Asia, also faced similar challenges and responded with a comprehensive digital transformation strategy through the development and enhancement of the Shopee application. In this context, the concept of enterprise architecture is crucial as a comprehensive view of the structure and components of an organization, encompassing business processes, information technology, and human resources, to support the achievement of strategic goals (Wiyana & Winarno, 2015). One of the widely used approaches is the Zachman Framework, which has proven effective in planning, managing, and implementing enterprise architecture (Kotusev, 2019; Suryana, 2012), sehingga dapat membantu organisasi memastikan keselarasan antara teknologi dan tujuan bisnisnya.

In this context, enterprise architecture becomes crucial as an approach to aligning business processes, information technology, and human resources to support the achievement of the organization's strategic goals (Bhattacharya, 2017; Maulana et al., 2023). One widely used framework is the Zachman Framework, which offers a systematic model for organizing various perspectives in enterprise architecture (Pereira & Sousa, 2004). This framework outlines six key perspectives (What, How, Where, Who, When, and Why) that enable companies to develop a structured plan to align technology with business objectives (Mani et al., 2015). This approach helps companies develop a structured plan to align technology with business objectives. Thus, implementing this framework

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provides a strong foundation for organizations to navigate the dynamics of business change and innovation in the digital age.

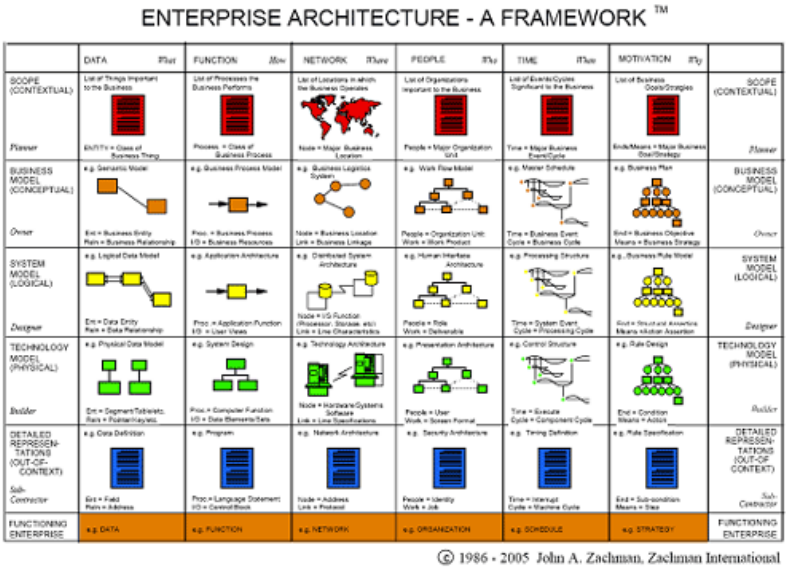

Figure 1. Zachman Framework Standards

The Zachman Framework is a framework that describes an organization through two main dimensions, namely columns and rows (Bondar et al., 2017). Columns include six basic perspectives: What (data), How (process), Where (network), Who (human resources), When (time), and Why (motivation), each of which highlights a different aspect of the organization (Iyamu, 2018). Meanwhile, the rows represent levels of abstraction starting from the scope, business model, system model, technology model, to detailed implementation and functioning systems (Tannady et al., 2020). Through the combination of these two dimensions, the Zachman Framework provides a holistic view that facilitates the alignment of business strategy and technology infrastructure (Masuda & Viswanathan, 2019). However, although this framework has been widely applied in various sectors, empirical studies related to its application in the e-commerce industry in Southeast Asia, especially in the case of Shopee, are still limited and thus require further research.

Various previous studies have shown that the Zachman Framework has been widely used to support the planning, design, and management of enterprise architecture in various sectors, from manufacturing, education, to public services (Fadlil et al., 2021; Simanjuntak et al., 2019; Suryantara & Ginting, 2020). This framework has been proven to help organizations align business processes with technology infrastructure and improve information management efficiency (Nasution et al., 2018). However, most research still focuses on the context of traditional organizations and large-scale institutions at the global level, while studies on the e-commerce sector in Southeast Asia are relatively rare. Yet, with the rapid growth and complexity of its digital ecosystem, e-commerce platforms like Shopee face an urgent need to manage system consistency while adapting to rapidly changing market dynamics. Therefore, this study on the application of the Zachman Framework to Shopee not only fills a gap in the literature but also has the potential to provide practical contributions for other e-commerce companies in developing sustainable digital transformation strategies.

One example of the implementation of the Zachman Framework can be seen at PT Shopee International Indonesia through the development and improvement of the Shopee application. As a complex and rapidly growing e-commerce platform, Shopee faces challenges in maintaining consistency and flexibility across its system components. Through the implementation of the Zachman Framework, Shopee can map various system components, from user transaction data to backend workflows, into a

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clear, systematic, and structured framework. This study aims to analyze the implementation of the Zachman Framework at Shopee in the context of application development, by examining each perspective contained within the framework and the benefits resulting from its approach. Understanding Shopee's experience is expected to provide valuable insights, not only for e-commerce companies, but also for other industrial sectors in facing the demands of digital transformation through the implementation of effective enterprise architecture.

2. METHOD

In this section, the method used in the shopee company case study uses a qualitative approach with a case study of the Shopee company. The methodology used in designing this research is to use the Enterprise Architecture (EA) methodology with the Zachman framework method as a tool for the documentation process, as well as literature studies as a reference for obtaining process designs including several ways, as follows:

a. Literature search, which is research conducted by searching relevant libraries and regarding the research topic under study.
b. Direct observation carried out to the location (observation) in order to see firsthand the processes that occur during production related to the material needed in the preparation of research such as studying documentation.

The study involved stakeholders related to Shopee's information architecture, such as business architects, developers, product managers, and related IT staff. The number and profile of participants were determined based on the need to obtain relevant and representative data. The results of the analysis will be interpreted holistically to compile a picture of the implementation of the Zachman Framework in the development of information architecture at Shopee company. The research findings will be linked to related literature and communicated in the form of a research report.

3. RESULTS AND DISCUSSION

The initial stage of the EAP methodology; Defining the initial planning system as the subject of organizational research with information system design vision, scope and objectives, in the hope of determining the development of information architecture occurs in accordance with business processes.

3.1. Value Chain

The business processes contained in Figure 2 represented by the value chain are existing processes to list existing business processes and determine the activities in each business process modeled after the business process.

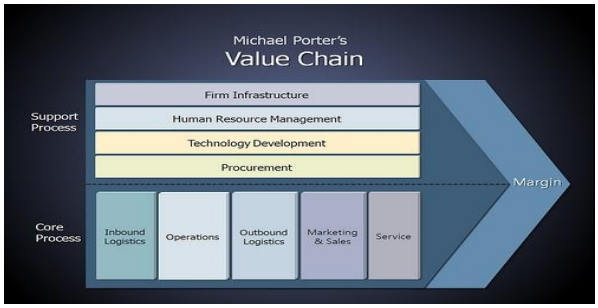

Figure 2. Shopee's Value Chain

With respect to information architecture development, this approach helps Shopee design and implement the right technology solutions, maintain data integrity and security, and enhance user experience when making transactions on the Shopee platform.

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3.2. Zachman Framework

After entering the value chain of shopee's business process, the next approach is used to analyze, plan, and develop information architecture within the shopee company. This framework has six different perspectives, namely Who, What, When, Where, Why, and How.

Table 1. Implementation of Zachman Framework for Development

Aspect/ Perspective	What	How	Where	When	Who	Why
Architect	Data and information	Designed the structure and architecture of shopee's data and information management system.	Company data center at shopee	During the development of information systems at shopee	Information system development team	Provide a competitive advantage for shopee companies in the e-commerce industry.
Owner Bisnis	Kebutuhan bisnis	Identify the business problem or opportunity that the information system needs to address, and define the goals and expectations to be achieved.	Dari masing-masing departemen dan unit bisnis.	Before starting the development of an information system	Business owners and department managers	Information systems can improve operational efficiency and effectiveness throughout an organization.
Services	Infrastructure	Provide the necessary infrastructure to run the information system	The whole organization	After the development of the information system is completed	Technical support team	To ensure information systems run smoothly and are available to the entire organization.
User	Business usability	Using information systems to perform business functions	The whole organization	After the development of the information system is completed	All employees and other stakeholders	To improve the efficiency and effectiveness of the organization's operations
Auditor Internal & External	Security and compliance	Ensure the security and compliance of information systems with applicable regulations and standards.	The whole organization	After the development of the information system is completed	Team of internal and external auditors	To ensure information systems are secure and comply with applicable regulations and standards

3.3. Zachman Framework Results

The results of the analysis using the Zachman framework method are described below:

a. Architecture

The approach method used in enterprise architecture planning (EAP) consists of the following stages:

1) What = Information data
2) How = designing the structure and architecture of data and information management systems at Shopee.

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3) Where = Shopee Enterprise data center
4) When = During the development of information systems at Shopee
5) Who = Development team
6) Why = provide a competitive advantage for the Shopee company in the e-commerce industry.

b. Business Owner

1) What = Business Functions
2) How = Identify the business problem or opportunity that the information system needs to address, and determine the goals and expectations to be achieved.
3) Where = each department and Business unit
4) When = Initiating Information System Development
5) Who = business Owner and Department Manager
6) Why = Information systems can improve operational efficiency and effectiveness throughout the organization.

c. Services

1) What = Infrastructure
2) How = Provide the necessary infrastructure to run the information system.
3) Where = Entire Organization
4) When = After Information System Development
5) Who = Technical Support Team
6) Why = To ensure information systems run smoothly and are available to the entire organization.

d. User

1) What = business usability
2) How = Using information systems to perform business functions
3) Where = Entire Organization
4) When = After Information System Development
5) Who = All employees
6) Why = To improve the efficiency and effectiveness of the organization's operations

e. Internal Auditor

1) What = Security
2) How = Ensure information system security and compliance with applicable regulations and standards.
3) Where = Entire Organization
4) When = After Information System Development =m0
5) Who = Entire Audit Team
6) Why = To ensure information systems are secure and comply with applicable regulations and standards

The results of the analysis conducted using the Zachman framework method provide an in-depth understanding of the various aspects involved in planning and implementing information systems at Shopee, a leading e-commerce company. In the Architecture dimension, the planning method used is Enterprise Architecture Planning (EAP). The steps in this approach have been clearly outlined, starting from the "What" pertaining to the information data taken care of, the "How" regarding the design of the structure and architecture of the data and information management system at Shopee, to the "Why" highlighting how this implementation gives Shopee a competitive advantage within the e-commerce industry. In addition, "Where" points to the company's data center, "When" signifies the development period of the information system, and "Who" refers to the development team responsible for the implementation.

The Business Owner dimension describes the role of business owners and department managers in identifying problems, opportunities, goals, and expectations for the information system. They act as

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guides, indicating the direction the implementation team should take. The Services dimension emphasizes the importance of the infrastructure needed to run the information system, including maintenance and technical support after system development is complete. The User dimension emphasizes the role of all employees in utilizing the information system to carry out business functions within the organization. This aims to improve operational efficiency and effectiveness. This research is supported by the findings Putri et al. (2020) which emphasizes that the involvement of business owners, service infrastructure, and users is key to ensuring the success of enterprise architecture implementation.

Meanwhile, in the Internal Auditor dimension, the security and compliance aspects of information systems with regulations and standards are clearly outlined. The internal audit team plays a crucial role in ensuring that information systems are secure and compliant with applicable regulations. This research is also supported by studies (Togo & Er, 2022) which demonstrates the importance of governance and oversight in maintaining the sustainability of information systems. The results of the analysis using the Zachman Framework on Shopee are in line with several studies conducted by Saoud & Bellabdaoui (2023), Nogueira et al. (2013), dan (Lee & Arvin, 2025), This demonstrates that the Zachman Framework provides a holistic view of how information systems are planned and implemented. Each dimension has its own role, and collaboration between all parties involved will ensure the successful implementation and utilization of the information system.

4. CONCLUSIONS

The implementation of the Zachman Framework in the development of information architecture at Shopee Company helps in designing, analyzing, and implementing an effective and integrated architecture. The Zachman Framework provides a structured and comprehensive framework for understanding business, technology, and data perspectives in organizations. By using the Zachman Framework, Shopee Company is able to clearly identify and describe the business objectives, operational processes, data needed, technology infrastructure required, and the roles and perspectives involved in the organization. This helps in aligning the information architecture with the business strategy and user needs.

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