



Evaluation of The Architecture Of The Information System of Seblak Si Bocah Kencur Sales In Malang City Based On The Zachman Framework

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Abstract

In the digital era, information system integration and structure are crucial needs for MSMES in increasing efficiency and competitiveness. Seblak Si Bocah Kencur, a culinary business in Malang City, has utilized a simple sales information system but does not yet have a documented and standardized system architecture. This study aims to evaluate the sales information system architecture using the Zachman Framework approach to map the system as a whole based on six perspectives and six main focuses. The method used is Applied Research with Research and System Development (RSD) through interviews, observations, and system documentation. The results of the study show weaknesses in the documentation of business strategies and data integration, even though networks and applications are already available. The resulting recommendations are in the form of a redesign of the information system architecture that supports managerial decision making and operational efficiency. This study provides a practical contribution in the form of an initial blueprint of the information system architecture that can be developed as a basis for digitalizing business processes as a whole in culinary MSMES.

Keyword: Enterprise Architecture, Zachman Framework, Sales Information System, Research and System Development, Applied Research, MSMES , Business Digitalization.

1. Introduction

In Indonesia, Micro, Small, and Medium-sized Enterprises (MSMEs) in the culinary sector continue to experience rapid growth, especially in major cities like Malang, known as an educational hub and culinary tourism destination. One prominent MSME in this city is Seblak Si Bocah Kencur, a food business focused on flavor innovation and swift customer service. To support its operations and consumer services, this business has implemented a simple sales information system, including digital menus, digital transaction recording, and stock data management. However, with increasing business scale, the need for a more structured, integrated, and sustainable system becomes increasingly crucial (Handani et al., 2022). Without an information system designed with a clear architectural approach, various issues can arise, such as data inconsistency, difficulties in managerial decision-making, and limitations in future system development (Alawamleh et al., 2021; Fawazzie et al., 2025; Hastuti et al., 2025).



The integration and structure of information systems are fundamental needs for MSMEs in the digital era to enhance efficiency and competitiveness (Ikhwana & Dianti, 2022; Putro et al., 2023). In this context, the Zachman Framework serves as a comprehensive approach to evaluate and map the overall information system architecture (Afriwaningsih et al., 2024; Jahir et al., 2024). This framework, which includes six perspectives (Planner, Owner, Designer, Builder, Subcontractor, and Functioning System) and six key focuses various viewpoints (Zachman, 2003). The application of the Zachman Framework in designing information system architecture for MSMEs has proven to be a significant contribution in previous research (Ningtyas et al., 2025)

This study aims to evaluate the sales information system architecture of Seblak SiBocah Kencur using the Zachman Framework approach, to comprehensively map the system based on its perspectives and focuses. Gap analysis indicates that although network, sales, and warehouse management applications are already in use, the business lacks a comprehensively documented and standardized system architecture. Key weaknesses were identified in business strategy documentation and data integration. Therefore, this research will provide recommendations in the form of a redesigned information system architecture that supports managerial decision-making and operational efficiency.

The structure of this journal is as follows: The Introduction section discusses the background, problems, and objectives of the research. The Literature Review section outlines relevant theories and studies. The Research Methods section explains the approach and data collection techniques used. The Results and Discussion section presents the findings and relevant data analysis. Finally, the Conclusion section summarizes the research results, study limitations, and practical implications.

2. The Art of Research

The importance of management information systems in the modern business world has been a widely researched subject, with Laudon & Laudon (2021) and Laudon et al., (2025) serving as fundamental references that highlight their crucial role in managing digital enterprises. Particularly for Micro, Small, and Medium-sized Enterprises (MSMEs), the adoption and implementation of structured information systems are key to improving operational efficiency, competitiveness, and business sustainability in the digital era. To achieve these goals, Enterprise Architecture (EA) provides a holistic framework for documenting and analyzing information systems within an organization (Al-Kharusi et al., 2021; Fawazzie et al., 2025). One of the most widely recognized and applied EA frameworks is the Zachman Framework (Gerber et al., 2020). Zachman (1987) first introduced this framework as a taxonomy for classifying information system architecture artifacts, which then evolved into a matrix with six rows of perspectives (Planner, Owner, Designer, Builder, Subcontractor, Functioning System) and six columns of focuses (What-Data, How-Function, Where-Network, Who-People, When-Time, Why-Motivation). This framework allows for a comprehensive understanding of systems from various viewpoints, ranging from business concepts to technical implementation (Sharma & Sarkar, 2024).

Previous research has extensively explored the application of the Zachman Framework in the context of MSMEs and information systems (Ningtyas et al., 2025). Siregar and Ramadhani (2020) demonstrated how the Zachman Framework can be utilized in designing information system architecture for MSMEs, emphasizing the importance of standardization and documentation. Similarly, Wibowo and Nugroho (2019) analyzed and designed enterprise architecture using the Zachman Framework for MSMEs, highlighting its benefits in aiding decision-making and system development. Both studies affirm that applying architectural

frameworks can address common issues in MSMEs without clear architectural planning, such as data inconsistency and limitations in system development. Nevertheless, there remains a research gap in the specific application of the Zachman Framework to culinary MSMEs with dynamic operational characteristics and the need for integration between Point of Sale (POS) systems and warehouse management, as exemplified by Seblak Si Bocah Kencur.

Based on this literature review, the research will employ the Zachman Framework as its development and evaluation framework. The Zachman matrix will be used to map the sales information system architecture of Seblak SiBocah Kencur (Nasution et al., 2018). Each cell in the matrix will be populated with relevant system representations from the six perspectives and six focuses, starting from conceptual viewpoints (Planner, Owner) down to detailed implementation (Designer, Builder, Subcontractor, Functioning System). This approach is expected to provide a clear architectural blueprint, identify areas of weakness, and recommend necessary improvements for comprehensive digital business process optimization.

3. Method

This study uses a qualitative descriptive approach with the Research and System Development (RSD) method consisting of: (1) direct observation of the sales process, (2) interviews with owners and staff, and (3) analysis of information system documentation (Leonardo & Wiratama, 2023). The evaluation was conducted based on the Zachman Framework which includes six perspectives: Planner, Owner, Designer, Builder, Subcontractor, and Functioning System, with a focus on the aspects of What, How, Where, Who, When, and Why (Zachman, 2003).

Perspective (Row)	What (Data)	How (Function)	Where (Network)	Who (People)	When (Time)	Why (Motivation)
Scope (Planner)	Food menu, transaction data, menu display, stock opname, warehouse expenditure records	Customer service processes on menu display, Cashier data input, stock design in the warehouse section	Seblak Si Bocah Kencur Malang	Customers, cashier, admin, and warehouse staff	Restaurant operational hours	Improve service satisfaction and efficiency
Business Model (Owner)	Service system, menu categories, customer data warehouse, raw material stock, employee workflow	Ordering system, payment, employee workflow, raw material stock management	Physical restaurant, admin office, warehouse, kitchen	Manager, all Employee divisions, admin, warehouse staff	Work shifts and service design activities	Maximum profit through fast service
System Model (Designer)	Ordering system, employee	Process flow: order → pay → process	POS application, Backend	Roles: admin, chef, waiters, cashier	Daily reports and inventory Procurement	Automation And efficiency in restaurant



	workflow,raw materials	→self-service by customer	system			operations
Technology Model (Builder)	SQL database for menu & transactions	CRUD implementa tion, POS system	Local network, Cloud server	System user Accounts (role-based login)	Daily data sync, notifications	System reliability, reduce human error
Detailed Representations (Subcontractor)	Database tables: tbl_menu, tbl_order, tbl_user	Code (PHP, Laravel, React)	IP address of cashier machine, router	Login module, staff dashboard	Execution time of each function	Code documentation for decision making
Functioning System (User)	Menu display, receipt, daily report	POS user interface, tablet based ordering	Interaction between cashier, waiter, and kitchen	Restaurant staff & customers	System response time, queue	User comfort, service speed

4. Result

The evaluation results show that Seblak SiBocah Kencur has used cashier and warehouse management applications (Pawoon and Indogoldan), but does not yet have comprehensive system architecture documentation. Each perspective in the Zachman Framework is analyzed and shows several gaps, especially in business strategy documentation, integration between systems, and data synchronization. On the other hand, the transaction process, stock management, and user roles have been supported by a fairly good system.

Planner:

- A. What: Here's what it looks like from a planner's point of view:
 1. The menu display on Seblak Si Bocah Kencur will use a virtual barcode scanning system, so here customers who come will immediately scan the barcode that has been provided at the cashier which will immediately display the available menu. The designer's goal here is to make time efficient in the customer queue.
 2. Stock taking at the cashier at the time of closing order will use an automatic system a does not perform manual and repetitive data input
 3. Recording the expenditure of goods or raw materials will use a new system, namely automatic data management at once and more structured storage of raw materials so that there is no input of goods expenditure many times.
- B. How: Here it explains the customer service process and input from the cashier, the warehouse part is more structured and efficient and automatic so that it does not cause repeated input.
- C. Where: Here explains the address of Seblak Sibocah Kencur Restaurant Jl. Candi Panggung Bar. No.66d 1, Mojolangu, Kec. Lowokwaru, Malang City, East Java 65142 When: Here explains the structured work operating hours, namely 09.00 WIB- 21.00WIB.
- D. Why: Improving service satisfaction and efficiency at Seblak Si Bocah Kencur Malang restaurant

Owner:

A. What: Here explains the original data from the owner about the system used. The results of the data used by the owner are as follows:

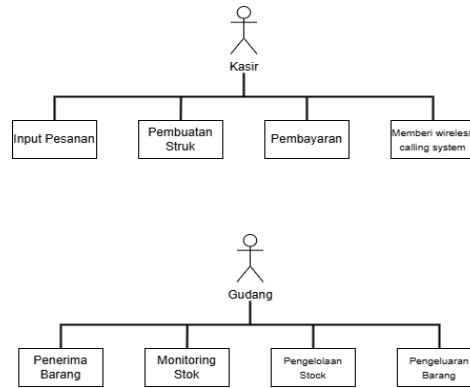


Figure 1. Original Data From The Qwner About the System Used

1. The service and ordering system already uses a fairly adequate cashier application by using a self-service system for order delivery.

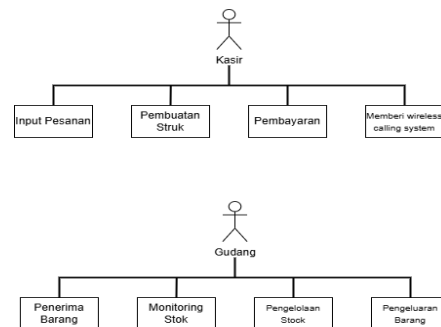


Figure 2. The Service and Ordering System

2. The raw material stock here is from the role of the warehouse admin who is in charge of inputting incoming and outgoing data using the warehouse application that is already available and is already operating properly.
 3. The employee work system also uses good SOPs that have been determined by the owner's policy and the employee's safety.
- B. How: Employee service system and employee work procedures that are in accordance with work SOPs.
- C. Where: The service place is in the form of a physical restaurant consisting of an office, warehouse and kitchen.
- D. Who: This involves all roles that have been working, including Managers, all employee divisions, admins and warehouse sections.
- E. When: Here it explains the employee work shift schedule and activities that have been prepared by the admin and change every month.
- F. Why: Maximum profit with fast service.



Table 2. Employee Schedule

SIBOCHAH KENCUR							
KASIR	SENIN	SELASA	RABU	KAMIS	JUMAT	SABTU	MINGGU
DINI	P	M	M	M	M	P	
YUNSI	M	M	M	P	P	M	PAGI GANTAI
RETA	M	P	P	M	M	M	
COOKING	SENIN	SELASA	RABU	KAMIS	JUMAT	SABTU	MINGGU
RENDY	M	M	M	P	M	P	M
ANGGA	P	P	M	M	M	M	M
LUFFI	M	M	P	M	M	M	P
SINYO	M	M	M	P	P	M	M
LATIFA	P	M	M	M	P	M	M
AZIZAH	M	P	P	M	M	M	M
DORRIS	M	M	M	M	M	P	P
WAITERS	SENIN	SELASA	RABU	KAMIS	JUMAT	SABTU	MINGGU
VITO	M	M	P	P	M	M	M
RAFLI	M	M	M	M	M	M	P
RAMA	M	M	M	M	P	P	M
ERIKO	P	P	M	M	M	M	M
CHANDRA (PT)	17-21	17-21	17-21	17-21	17-21	17-21	17-21

NOTES – TURAI LEBUR ATAU TURAI SHIFT SELAIKAN KOORDINASI KE TEAM BERSANGKUTAN DAN KONFIRMASI KE

Table 3. Jobdesk Table

No	Peran	Jobdesk
1	Kasir	Memasukan input data pembelian dan memberikan Remote Wireless Calling System
2	Waiters	Membuat minuman, Platting di meja platting & Memanggil pelanggan
3	Dapur	Memasak item pilihan pelanggan
4	Gudang	input bahan baku & input barang return
5	Admin	Pengadaan Barang & Mutasi Produk

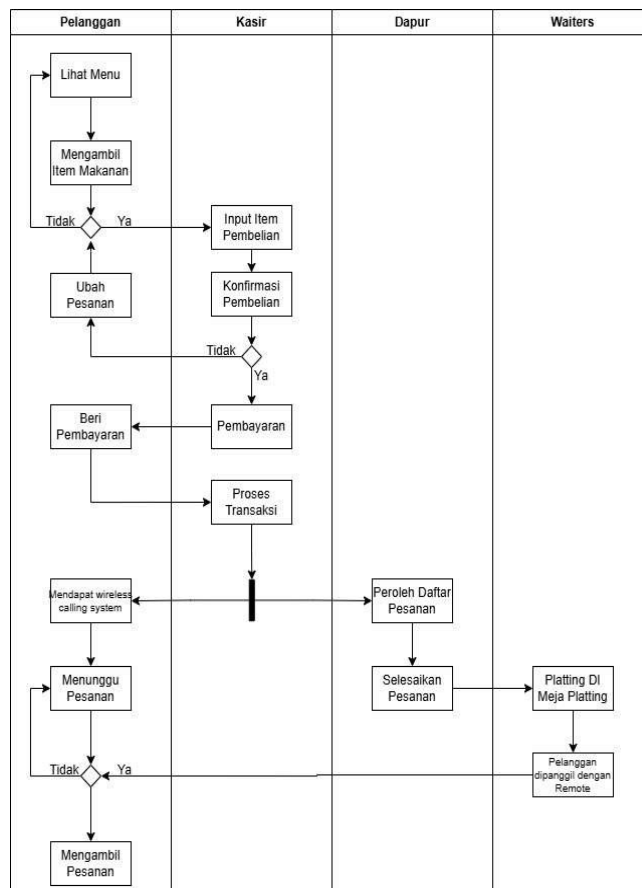
Designer:

A. What:

1. The ordering system uses a pawon application that has been structured in it containing a menu list and the price of goods.
2. The employee's work is based on SOPs that have been made based on the owner's policy.
3. Raw materials use an indogolden application-based system which contains the name of the raw material stock, the time of order and data on incoming and outgoing goods.

B. How: Here we explain about the service system process

Table 4. Diagram Activity



C. Where: Here displays the cashier application and warehouse application used.

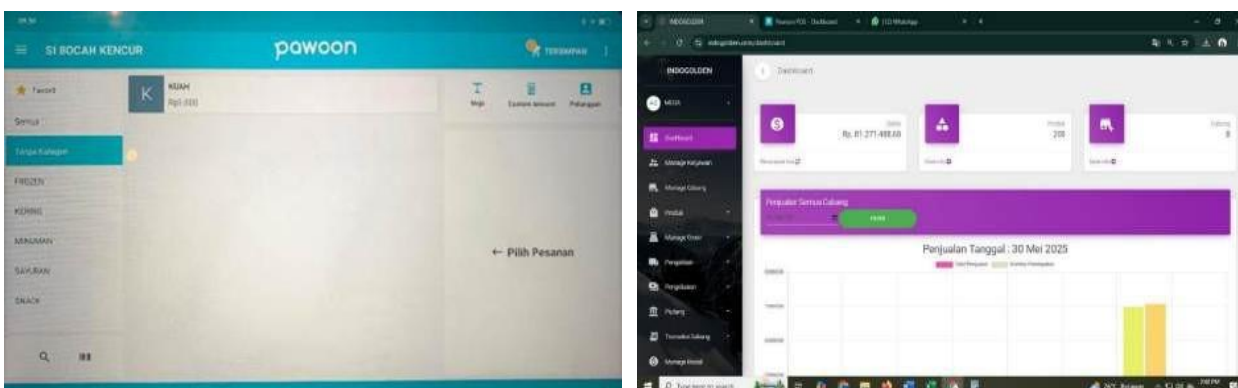


Figure 3. Displays Menu cashier and Data Warehouse

- D. Who: Here explains about the people who are in charge according to their respective divisions, including the cooking division, waiters division, cashier, warehouse and admin.
- E. When: Here it displays daily reports and procurement of goods including product mutations.
- F. Why: Automation and efficiency of restaurant processes.

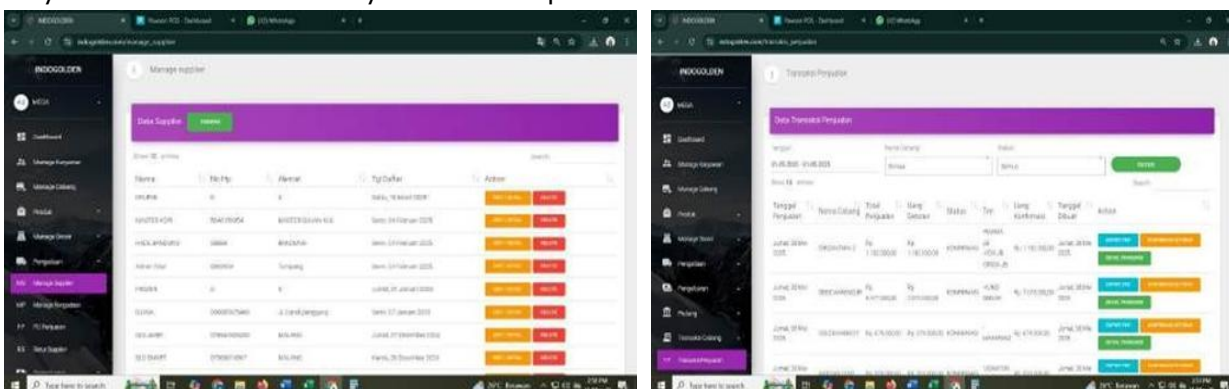


Figure 4. Daily Reports and Procurement of Goods Including Product Mutations

Builder:

- A. What: Both applications most likely use cloud-based databases (such as PostgreSQL or MySQL) to store data centrally, allowing real-time access from a variety of devices and locations.
- B. How: Pawoon: Focus on a complete Point of Sale (POS) system, covering sales transactions, simple inventory management, sales reports, customer management, and promos. Supports a variety of payment methods. Indogoldan: Focus on warehouse management systems (WMS), including inventory management, inbound processes (receiving goods), outbound (shipping goods), transfers between warehouses, stock adjustment, and tracking goods.
- C. Where: Pawoon: In the form of a mobile application (Android/iOS) that runs on a tablet or smartphone, with the ability to connect to a thermal printer via Bluetooth or LAN. Indogoldan: Umumnya web-



based, dapat diakses melalui browser di desktop atau perangkat mobile, dan mungkin terintegrasi dengan barcode scanner melalui browser.

- D. Who: Both implement role-based login systems, such as owner, cashier, or admin for Pawoon, and warehouse admin, warehouse staff, or manager for Indogoldan, to manage access rights and functionality.
- E. When: Both Pawoon and Indogoldan prioritize real-time or near-real-time data synchronization with their cloud servers. This is important to ensure that transaction or inventory data is always up-to-date. Both also provide notifications related to important activities (for example, new transactions in Pawoon or low stock in Indogoldan).
- F. Why: Both rely on a robust cloud infrastructure to guarantee system availability and data redundancy. Process automation in each application is designed to reduce human error and improve operational efficiency.

Subcontractor:

- A. What: Pawoon: transactions (for sales records), items (products), customers, users, outlets (branches), payments. Indogoldan: products, inventory_locations (warehouse location), stock_movements (stock movement), inbound_shipments (receipt), outbound_orders (shipping), users.
- B. How: Pawoon: Involves a mobile app (likely built with Java/Kotlin for Android and Swift/Objective-C for iOS) and a web-based dashboard for management. The backend is likely to use a web framework such as Laravel or Node.js. Indogoldan: A full-fledged web-based application. The backend may use frameworks such as Laravel, Ruby on Rails, Django, or Node.js, while the frontend may use React, Vue, or Angular.
- C. Where: For both applications, the IP address of the cash register or local server is not directly relevant to the end user. Both operate with farm servers in the cloud that have a public IP.
- D. Who: Pawoon: The main modules include sales transactions, product management, reports, discounts/promos, customers, and outlet management. Indogoldan: Key modules include stock management, goods receipt, freight forwarding, stock transfer, and inventory reports.
- E. When: Both applications are optimized for speed and responsiveness in their core functions, whether it's the fast transaction process in Pawoon or the efficiency of stock recording in Indogoldan.
- F. Why: Both are expected to follow modern software development practices, with a focus on scalability, user experience (UX), and workflow acceleration based on specific operational needs.

User:

- A. What: Here displays the display of the information system application page used, namely "INDOGOLDEN". Here it displays all the products and product sales needs.

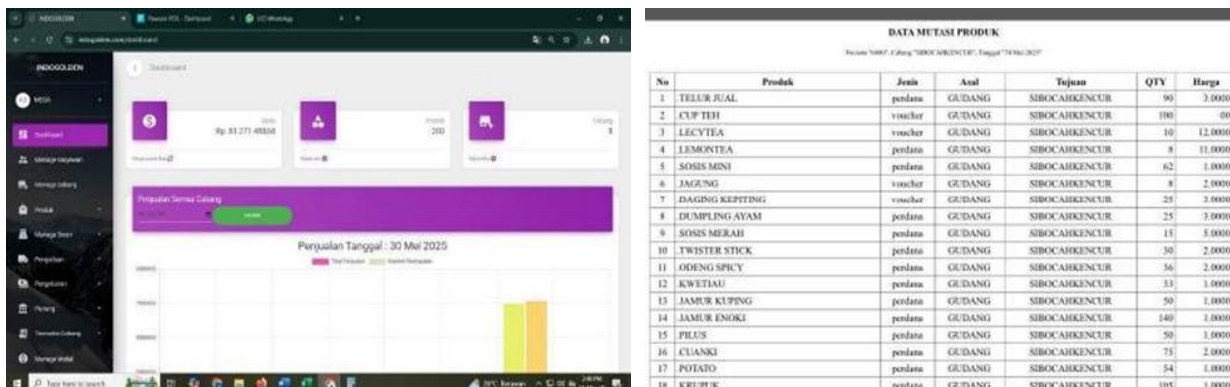


Figure 5. displays Menu For The Products and Sales Needs

B. How: Here displays the display of an information system in the form of an application with the name "PAWOON". Here it displays the display of cashier sales services along with the menu list in detail.



Figure 6. Cashier Sales Service Menu Dashboard

(The following is a picture of the application display used by the cashier, namely Pawon. This application provides a display in the form of a list of menu items and transaction data)

- C. Where: Here it displays the place and process of cashier services and kitchen services that are adjacent to the position of the kitchen on the first floor next to the cashier and on the second floor where customers eat and prayer rooms and basement floors.
- D. Who: Here it shows about all those who play a role in the sales process, namely all employees and admins.
- E. When: Here explains about the sales queue time system, the queue display is lined up and limited by the queue limiter that has been prepared.
- F. Why: User convenience, speed of service.

5. Discussion

The discussion of the evaluation results demonstrates that the implementation of the Zachman Framework provides a comprehensive overview of Seblak SiBocah Kencur's sales information system architecture. The strengths of the current system include the use of cloud-based technology, an integrated POS system (Pawoon), and an effective warehouse management application (Indogoldan). However, the main weaknesses lie in the aspects of formal documentation, limited inter-application integration, and insufficient



long-term strategic planning. The architectural blueprint generated from this evaluation can serve as a basis for developing a more adaptive and efficient system.

The proposed architectural design through the Zachman Framework offers clear guidance for Seblak Si Bocah Kencur to develop its information system. Firstly, with more structured documentation (e.g., through the Planner and Owner perspectives), the owner can formulate clearer and more focused business strategies related to technology utilization. For instance, recommendations regarding business strategy documentation can facilitate the determination of long-term technology goals, such as full process automation or business expansion to other branches. Secondly, the identified gap in inter-system integration (Pawoon and Indogoldan) becomes a starting point for developing smoother data connectivity. This could involve developing custom APIs or using middleware integration platforms so that sales and stock data can be synchronized automatically and in real-time, reducing repetitive manual input and minimizing errors. Thirdly, the architectural blueprint enables management to make more targeted technology investment decisions, as they gain a comprehensive understanding of the "what," "how," "where," "who," "when," and "why" of each system component. This will support better managerial decision-making and overall operational efficiency.

- **Driving Factors:**
 - **Business Needs:** As Seblak SiBocah Kencur's business scales up, the need for a more structured and integrated system becomes crucial to address data inconsistency and decision-making difficulties.
 - **Early Technology Adoption:** The use of Pawoon and Indogoldan applications demonstrates the MSME's readiness to adopt technology, which provides a good foundation for further development.
 - **Efficiency Potential:** This design offers the potential to improve operational efficiency through process automation and better data synchronization, ultimately maximizing profits.
 - **Management Support:** The desire to improve service satisfaction and efficiency is a strong impetus from the management side.
- **Inhibiting Factors:**
 - **Lack of Formal Documentation:** The current absence of comprehensive system architecture documentation can complicate future development and maintenance processes.
 - **Limited Application Integration:** The limited integration between the cashier application (Pawoon) and warehouse management (Indogoldan) requires additional technical effort and cost for better data synchronization.
 - **Resource Limitations:** Although not explicitly mentioned, implementing a new architecture may require significant investment in time, cost, and technical expertise, which could be a challenge for MSMEs.
 - **Resistance to Change:** The adoption of new systems or changes in workflows may face resistance from employees, even though the current system is well-supported by SOPs.

The implementation and development of a more mature information system architecture are vital for Seblak Si Bocah Kencur to maintain and enhance its competitiveness in the dynamic culinary market. With a well-documented and integrated system, this MSME can: (1) Ensure consistency and accuracy of transaction and stock data, which is crucial for business performance analysis and sound decision-making. (2) Accelerate service processes and reduce human errors in recording and management, directly

improving customer satisfaction and operational efficiency. (3) Facilitate automatic sales turnover recording and reduce the risk of lost money or calculation errors, making transactions more organized (similar to the benefits of digital payments). (4) Provide a strong foundation for business scalability, allowing Seblak Si Bocah Kencur to expand (e.g., open new branches) without significant information system constraints. Thus, investing in information system architecture development is not just a cost, but a strategic investment for long-term business growth and sustainability.

6. Conclusion

This study concludes that Seblak Si Bocah Kencur has significant potential to improve its sales information system through an enterprise architecture approach based on the Zachman Framework. The evaluation conducted across the six perspectives and six focuses of the Zachman Framework indicates the need for improvements in information system documentation, inter-application integration, and data automation. Although transaction processes, stock management, and user roles are reasonably well-supported by existing systems, key weaknesses were identified in business strategy documentation and comprehensive data integration. The architectural blueprint developed can serve as a basis for the overall digitalization of this MSME's business processes in the future.

This study has several limitations. Firstly, the primary focus of the study was on evaluating the existing information system architecture and formulating a blueprint based on the Zachman Framework, rather than on full system implementation or development. Secondly, the research object was limited to a single culinary MSME, Seblak Si Bocah Kencur, meaning that the results and recommendations may not be entirely generalizable to all types of MSMEs without adjustments. Thirdly, research data was collected through direct observation, interviews with owners and staff, and analysis of available system documentation, which may have limitations in terms of completeness or depth of specific information.

This study provides significant practical contributions for Seblak Si Bocah Kencur and culinary MSMEs in general. Directly, this research offers an initial blueprint of the information system architecture that can serve as a concrete guide for developing a more structured and integrated system, supporting managerial decision making, and enhancing operational efficiency. For other culinary MSMEs, these findings highlight the importance of early information system architectural planning as a foundation for sustainable growth in the digital era. With a well-documented and integrated system, MSMEs can minimize the risk of data inconsistency, accelerate service, and optimize sales turnover recording, thereby being better prepared to face market challenges and improve competitiveness.

Acknowledgments

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