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Digitalization of the Sales System at Kios Mie Ayam Kangkung Subur, Cilegon City Using the Laravel Framework

Ardan Armana*, Umar Mansyuri, & Hamdan

Universitas Bina Bangsa, Serang, Banten, Indonesia

Abstract

The rapid advancement of information and communication technology (ICT) has brought significant changes to various business sectors, including micro, small, and medium enterprises (MSMEs). However, many MSMEs still rely on manual systems that are prone to errors, inefficiencies, and difficulties in recording and analyzing transactions. This research aims to develop a digital sales information system for Kios Mie Ayam Kangkung Subur in Cilegon City using the Laravel framework. The system was designed using a Research and Development (R&D) approach and developed with the Laravel PHP framework and MySQL database, following the Model-View-Controller (MVC) architecture. Data collection methods included observation, interviews, and documentation study. The development process involved system requirement analysis, interface and database design, implementation, testing, and documentation. The final product is a web-based application that supports key functions such as login and authentication, menu management, transaction processing, receipt printing, and sales reporting. Black-box testing was conducted to evaluate the system's functionality, and results showed that all modules performed according to expectations. The system proved to be user-friendly, efficient, and capable of improving transaction accuracy and operational speed. In conclusion, the developed digital sales system successfully meets the needs of Kios Mie Ayam Kangkung Subur and contributes to enhancing the kiosk's business processes through automation. The system also lays the groundwork for future technology adoption, such as online ordering or mobile access. This study demonstrates that Laravel is an effective solution for MSMEs looking to transition into the digital era and streamline their business operations.

Keywords: digitalization, sales system, Laravel, MSMEs, information system, kiosk.

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1. Introduction

The rapid development of information and communication technology (ICT) has significantly transformed various sectors of life, including micro, small, and medium enterprises (MSMEs). Digitalization in MSME operations has become a necessity in the era of the Industrial Revolution 4.0, especially in facing a dynamic market and changing consumer behavior that prioritizes speed and convenience in transactions (Ghozali & Hidayatullah, 2020). One of the most essential aspects of this transformation is the digitalization of sales systems, which enables automatic transaction recording, real-time stock monitoring, and accurate financial reporting.

As one of the pillars of Indonesia's economy, MSMEs play a vital role in supporting national economic growth, job creation, and improving community welfare. According to the Ministry of Cooperatives and SMEs, there are more than 64 million MSMEs in Indonesia, but most of them still rely on conventional methods in managing their businesses, particularly in sales processing (Ministry of Cooperatives and SMEs, 2021). This leads to various problems, such as unstructured documentation, data loss, difficulty in profit-loss calculations, and low transparency in business management.

Kios Mie Ayam Kangkung Subur, located in Cilegon City, is a local culinary MSME with unique product offerings, yet still depends on manual systems in its daily operations. Order recording, daily sales calculation, and stock management are performed conventionally, which is time-consuming and prone to human error. The absence of

* Corresponding author.
E-mail address: armanaardan@gmail.com

systematic transaction documentation also makes it difficult to evaluate business performance periodically. Therefore, a digital solution is urgently needed to address these challenges effectively and efficiently.

A web-based digital sales system is a technological solution widely adopted by MSMEs to improve operational efficiency. This system allows for automatic transaction recording, structured data storage, and real-time financial reporting. Furthermore, it enables better customer and menu management, enhancing service quality and customer satisfaction (Putra & Purnama, 2022). In implementing such a system, selecting the right development technology is key to success-one such tool is the Laravel framework.

Laravel is one of the most popular PHP frameworks today, using the Model-View-Controller (MVC) architecture. It offers many modern features such as routing, middleware, authentication, and an efficient ORM (Object Relational Mapping) system. Laravel also has extensive documentation and an active developer community, making it a top choice for web application development involving database interactions (Susanto & Arifianto, 2021). Laravel's strengths in security, development convenience, and scalability make it an ideal solution for building a reliable sales information system for MSMEs.

Through the digitalization of the sales system using Laravel, Kios Mie Ayam Kangkung Subur is expected to improve operational efficiency, reduce transaction errors, and enhance customer service. This system will also support the business owner in making better decisions based on accurate sales data. Additionally, this digitalization effort is a form of MSME adaptation to the growing digital economy, which increasingly demands speed, accuracy, and transparency in business operations.

Beyond just a sales system, the development of this application also represents a real contribution to empowering local MSMEs to digitally transform. Implementing a system that is tailored to field needs using appropriate technology such as Laravel is a significant step toward sustainable MSME digital transformation (Rahmadani & Setiawan, 2020). This project is expected to serve as a replicable model for similar small businesses in Cilegon and surrounding regions, while supporting the government’s vision to accelerate the digital transformation of Indonesia’s MSME sector.

2. Literature Review

The application of digital technology in the agricultural sector has seen significant growth in recent years, particularly through the concept of smart farming. Smart farming refers to the use of information and communication technologies, such as the Internet of Things (IoT), wireless sensors, and web-based systems to enhance efficiency and effectiveness in agricultural land management (Febrianti et al., 2021). This approach enables farmers to make accurate, data-driven decisions in real time, helping to reduce risks and increase crop yields.

Rachmawati (2020) stated that most farmers in Indonesia still rely on manual methods to monitor field conditions, such as temperature and humidity. These traditional methods are not only inefficient but also prone to errors and delays in decision-making. As such, web-based monitoring systems that are accessible and easy to use are seen as key solutions to help farmers respond quickly and accurately to changing field conditions. Leonardo (2021) supported this view, emphasizing that integrating web technologies can increase user engagement, particularly when systems are designed to suit local needs.

From a technical standpoint, the React.js framework is widely used in front-end development due to its strengths in building responsive and modular user interfaces. Renando (2024) developed an Agri-Intelligence Control System using React.js and demonstrated that this framework significantly improves the usability and efficiency of agricultural monitoring dashboards, especially for non-technical users like farmers. On the backend, Express.js is commonly used for its lightweight and flexible nature, as well as its ability to integrate with databases and RESTful APIs efficiently (Kumar et al., 2020). The combination of React.js and Express.js has proven effective for building full-stack web applications capable of handling real-time sensor data communication.

Research by Prasetyo et al. (2022) showed that hardware devices such as the ESP32 microcontroller, when combined with temperature and soil moisture sensors, can produce accurate monitoring data. However, many earlier systems were dependent on third-party platforms such as Blynk, which limited flexibility, scalability, and control over data. In this context, Rahman et al. (2021) emphasized the importance of using open-source technologies so that systems can be developed and modified independently according to the needs of local farming communities, while also being more cost-efficient.

In addition to the technical aspects, user-centered design is also a key factor in the successful adoption of agricultural technologies. Systems designed with simple, responsive, and contextual interfaces are more readily accepted by

farmers, particularly in rural areas. The use of visual tools such as interactive graphs, color-coded indicators, and automated alerts has been proven to improve users' understanding of land conditions (Utami & Sari, 2020).

Based on the literature reviewed above, it can be concluded that a combination of IoT technology, modern frameworks such as React.js and Express.js, and user-focused design principles forms a strong foundation for developing effective agricultural monitoring systems. However, more research is needed that integrates all these elements within the local context of Indonesia. This study aims to fill that gap through the development of DigiField, a smart farming monitoring platform designed to support farmers' decision-making by providing real-time data through an accessible and easy-to-use interface.

3. Methods

This study uses a research and development (R&D) approach aimed at developing a web-based sales information system using Laravel. This approach is applied because the researcher not only analyzes user needs but also designs, builds, and tests the system being developed. The research is applied in nature, with outcomes in the form of a functional application that can be directly utilized by the business partner (Kios Mie Ayam Kangkung Subur) to support sales operations.

3.1. Requirement Analysis

The requirement analysis phase is a critical initial step in the development of an information system. In this stage, the researcher focuses on identifying and formulating the system's needs to ensure it aligns with real business processes and user expectations in the field. The analysis was conducted through a combination of direct observation at Kios Mie Ayam Kangkung Subur and in-depth interviews with the business owner. The results of this analysis serve as the foundation for designing a system that can solve operational problems and provide added value to the business owner.

In general, the system requirements are classified into two categories: functional and non-functional requirements. Functional requirements refer to the core features that the system must provide to perform tasks as expected by the user. In the context of the sales information system, the identified functional requirements include user login and authentication features, menu management, transaction recording, receipt printing, user account management, sales reporting, data search capabilities, and a secure logout mechanism. These features are designed to facilitate daily transaction management activities and improve the accuracy of financial records.

On the other hand, non-functional requirements are related to the overall quality of the system, such as usability, system performance, data security, and maintainability. The system must be accessible across various browser-based devices, respond quickly to user commands, and ensure data security for both transactions and users. It should also have a user-friendly interface so that kiosk owners with non-technical backgrounds can operate it easily. Additionally, the system should support data backup features to prevent loss of critical information due to system failures or human error.

By conducting a thorough and well-directed requirement analysis, the development of this sales information system is expected not only to meet the user's basic operational needs but also to offer a long-term adaptive solution in line with the growth of the business. The results of this phase will be carried forward into the system design stage, which will be based on the outlined requirements.

3.2. System Design

The system design stage is a continuation of the requirement analysis phase, aimed at translating the identified needs into technical designs that can be implemented. In this stage, the system is designed to provide a comprehensive overview of workflow, data structure, user interface, and user-system interactions. A well-structured design helps minimize development errors and ensures that the system operates in accordance with user expectations.

The design process begins with creating a Use Case Diagram to map all the main functions and user interactions (in this case, the admin or kiosk owner) with the system. The use case diagram helps visualize user activities such as logging in, managing menu data, recording sales transactions, printing receipts, and viewing sales reports.

Next, the Entity Relationship Diagram (ERD) is designed to illustrate the data structure and relationships between entities in the system. The ERD serves as a blueprint for constructing the database structure, which includes entities

such as users, menus, transactions, and transaction details. With the ERD, the database can be built efficiently to support optimal data storage and retrieval.

The design of the User Interface (UI) is also a crucial part of this stage. The system interface is designed to be user-friendly, simple, and easy to operate by non-technical users. The main page presents a dashboard with access to core features, including menu management, sales transactions, sales reports, and logout. A clean and consistent visual design enhances the overall user experience.

With this comprehensive design approach, the developed sales information system is expected to support the operational activities at Kios Mie Ayam Kangkung Subur effectively and efficiently, while also contributing to the digital transformation of micro-enterprises in the local community.

a. Use Case Diagram

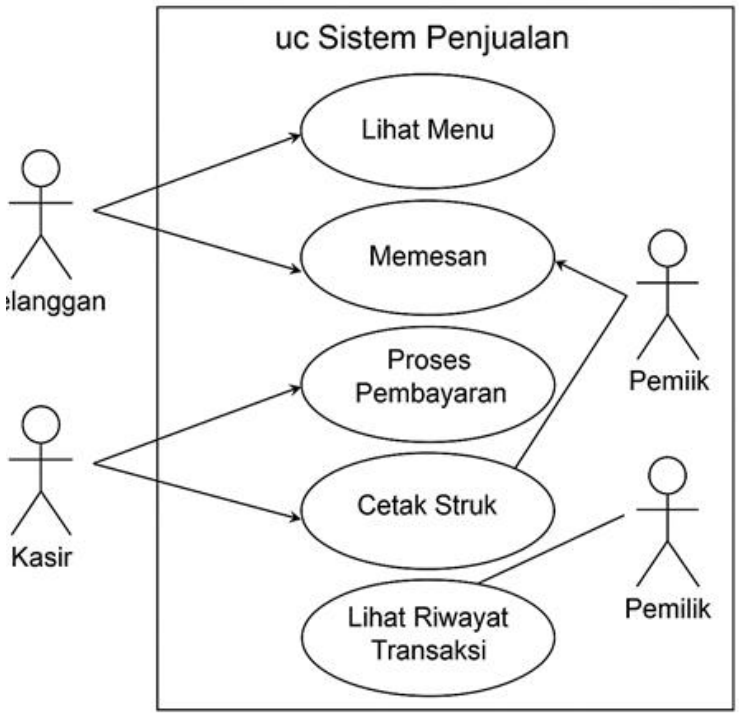

Figure 2. Use Case Diagram

This Use Case Diagram illustrates the interaction between three main actors—customers, cashiers, and the kiosk owner—and the developed sales system. Customers can view the menu and place orders through the system, while cashiers are responsible for processing payments, printing receipts, and viewing transaction history. The kiosk owner has full access to all key system activities, from handling orders to monitoring transaction records, to support comprehensive operational oversight and evaluation. The diagram presents a structured workflow and defines each actor's role in effectively supporting the digitalization of the sales process.

b. Activity Diagram

This Activity Diagram illustrates the flow of a sales transaction involving three main roles: the customer, the waiter, and the cashier. The process begins when the customer places an order for food and drinks, which is then forwarded by the waiter to the cashier for recording. Once the order is ready, the waiter delivers the food and drinks to the customer. The customer then proceeds to make a payment to the cashier. The cashier summarizes the transaction and payment data, followed by an evaluation to complete the transaction process. This diagram presents a structured workflow from the beginning to the end of the transaction, aiming to improve service efficiency and accuracy in the food kiosk.

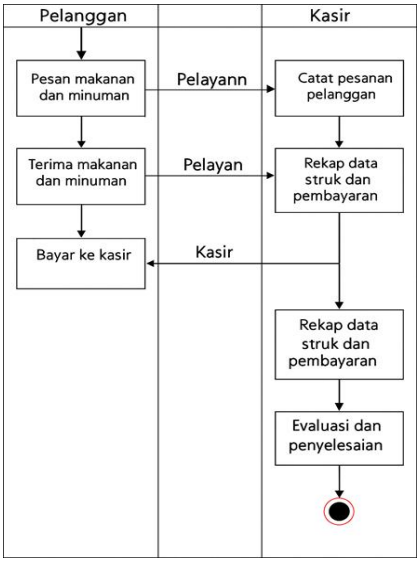

Figure 3. Activity Diagram

c. Class Diagram

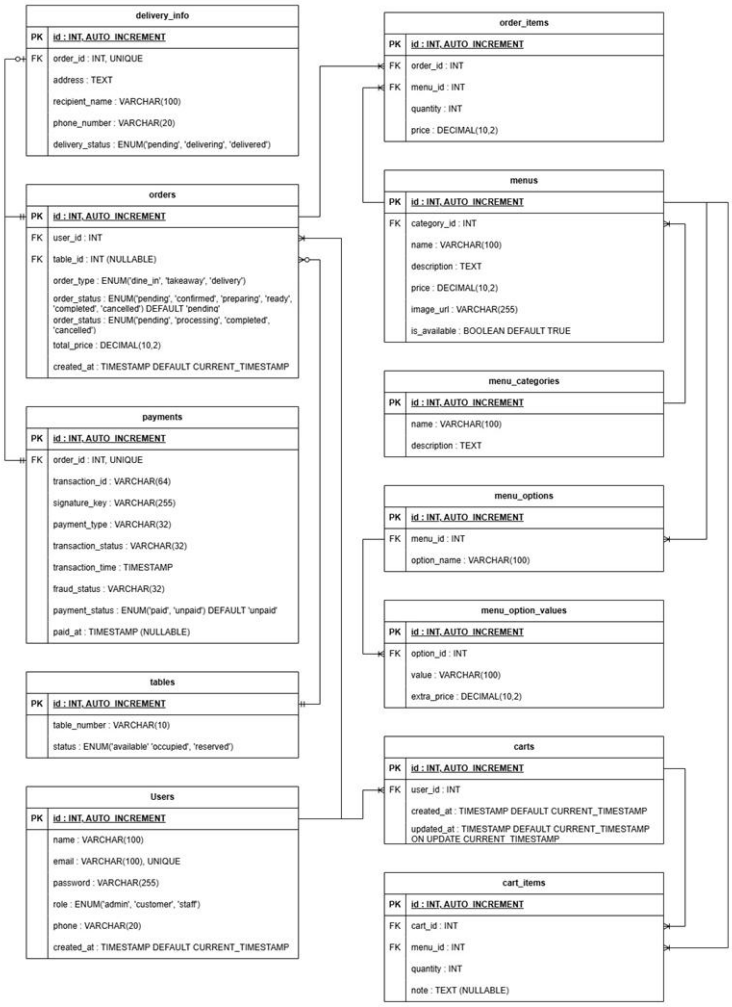

Figure 5. Class Diagram of the Monitoring System

3.3. Implementation

The implementation stage is the process of realizing the entire system design into a functional application that can be operated and used by the end user. In this study, the sales information system was developed using the Laravel framework, which is based on the PHP programming language and follows the Model-View-Controller (MVC) architecture. Laravel was chosen due to its well-organized structure, strong security features, and support for efficient development of small- to medium-scale applications.

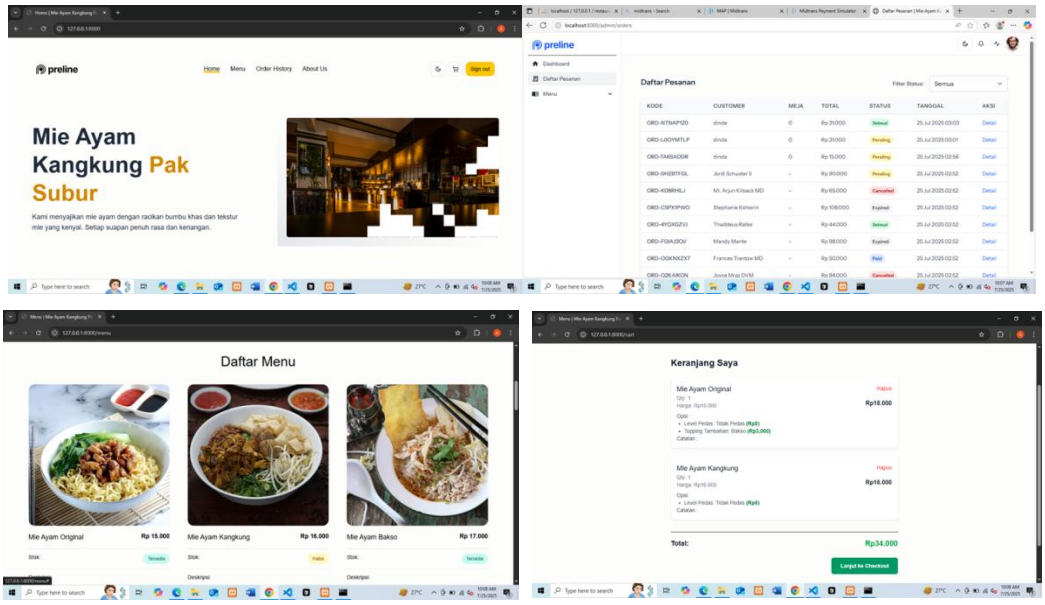

Figure 6. Implementation

The implementation process began with designing the database structure using MySQL. The main entities included in the system are: users, menus, transactions, and transaction details. The relationships between entities were built according to the previously constructed Entity Relationship Diagram (ERD), ensuring structured and integrated data storage.

Next, the user interface was developed using Laravel's Blade Template Engine, which supports dynamic and responsive web pages. The dashboard interface was designed to be user-friendly, featuring main functionalities such as menu data management, sales transaction entry, receipt printing, and sales reporting. In addition, Laravel's routing and middleware features simplified the management of user roles and access levels, such as admin and cashier.

On the backend side, the business logic for processing transactions and generating reports was implemented in the controller and model components. Transaction data entered by the cashier is automatically stored in the database and can be retrieved for receipt printing and report summarization. The system also includes filtering and search features for better data access and management.

The system was first deployed in a local development environment using a local web server (XAMPP or Laragon), before being prepared for production deployment so it could be accessed online by the kiosk owner. The entire implementation process was carried out in stages according to the needs of the business partner and tested using the black-box testing method to ensure that each feature functions correctly according to the design.

3.4. Schedule

The development of the sales information system at Kios Mie Ayam Kangkung Subur followed a structured schedule that was divided into several phases over a defined timeline. The project began in the first week with an observation

phase from April 14 to 16, 2025, during which the researcher visited the kiosk to observe the ordering and sales processes directly. This was followed by an interview session on April 17, 2025, with the business owner to collect detailed information regarding the system requirements and user expectations.

Table 1. Schedule Implementation

No.	Activity	Activity Details	Week	Date
1.	Observation	Visiting and observing the ordering process	1	April 14–16, 2025
2.	Interview	Interviewing the owner to collect necessary data	1	April 17, 2025
3.	System Requirement Analysis	Preparing the system requirement document based on the collected data	2	April 24, 2025
4.	Thesis Title Submission	Submitting the thesis title to the academic advisor	2	May 5, 2025
5.	Database Design	Designing the database schema and performing normalization	3	May 12–20, 2025
6.	Interface Development	Designing the user interface	4	May 21–24, 2025
7.	Thesis Writing	Writing and revising the thesis	5	May 27–June 23, 2025
8.	Documentation	Compiling and organizing all research documents	5	July 19, 2025

In the second week, a requirement analysis was conducted based on the data collected, resulting in a formal documentation of the system's functional and non-functional requirements on April 24, 2025. On May 5, 2025, the thesis title was formally submitted to the academic supervisor for approval.

The third week (May 12–20, 2025) focused on database design, including the development of a normalized schema to support the data structure of the application. This was followed by interface design activities during the fourth week (May 21–24, 2025), where the user interface was developed to ensure ease of use and functionality aligned with the users' needs.

From May 27 to June 23, 2025, in the fifth week, the researcher concentrated on thesis writing, including drafting, revising, and refining the research documentation in accordance with academic standards. Finally, on July 19, 2025, the researcher completed the documentation phase, compiling all supporting documents related to the research and system development.

3.5. Black Box Testing

Table 2. Black Box Testing

No	Function	Test Case	Expected Result
1.	Customer	Test ordering food with available stock.	Order is successful and data is saved.
2.	Payment	Test payment using different payment methods.	Payment is successful and confirmed.
3.	Menu Management	Test adding new menu item variations.	Food/drink item is successfully added.
4.	Purchase Report / History	Test generating purchase report for "mie ayam" orders.	Report is displayed correctly and accurately.

The system testing phase was conducted to ensure that the core features of the sales information system functioned as intended. The first test focused on the customer ordering process, where a food order was placed using available stock. The test succeeded as the order was processed correctly and the transaction data was saved in the database, confirming the functionality of the ordering module.

The second test involved processing payments using various payment methods. The system accurately recognized each method and confirmed the payment, demonstrating the flexibility and reliability of the payment processing feature.

The third test evaluated the menu management functionality by adding a new food or drink item. The system successfully stored the new menu data, indicating that the admin interface supported dynamic menu updates without error.

Lastly, a test was carried out to generate a purchase report, specifically focusing on mie ayam transactions. The system was able to compile and display the report with correct and detailed information, showing that the reporting module could accurately summarize sales history for review or analysis.

4. Result and Discussion

4.1. System Implementation Result

The development of the sales information system at Kios Mie Ayam Kangkung Subur has resulted in a web-based application designed using the Laravel framework and MySQL database. The system includes several integrated features that support the ordering process, transaction recording, menu management, and sales reporting. The user interface was developed to be simple, user-friendly, and responsive, allowing ease of use by non-technical users such as the kiosk owner and staff.

The implemented system consists of several main modules, including:

1) Login and authentication module, to manage user access.
2) Menu management module, allowing the admin to add, edit, or delete menu items.
3) Transaction module, which processes customer orders and records payment.
4) Receipt printing module, for generating transaction proof.
5) Sales report module, which displays daily, weekly, or monthly sales data.

Each of these modules was tested using the black-box testing method, and the results indicate that the system performs according to its functional requirements.

4.2. Discussion

The implementation of this digital sales system represents a significant improvement over the manual processes previously used at Kios Mie Ayam Kangkung Subur. Prior to the system, order records were written manually, leading to issues such as data loss, miscalculations, and difficulty in analyzing business performance. With the Laravel-based system, these challenges have been effectively addressed through automation and real-time data management.

The user-friendly interface ensures that even non-technical users can operate the system with minimal training. Moreover, the system's ability to generate sales reports enables the kiosk owner to make informed business decisions based on transaction data. This supports better inventory planning, pricing strategies, and customer service.

Overall, the digitalization of the sales process using Laravel has not only streamlined day-to-day operations but also positioned the kiosk to adopt more advanced technologies in the future. The system can be further enhanced by integrating additional features such as online ordering, customer loyalty tracking, or integration with e-wallet payment gateways.

5. Conclusion

Based on the results of system development and testing, it can be concluded that the implementation of a digital sales information system using the Laravel framework has successfully addressed the operational challenges faced by Kios Mie Ayam Kangkung Subur. The developed system provides key features such as menu management, transaction recording, receipt generation, and sales reporting, which are integrated into a user-friendly and efficient web application.

The system has proven to function effectively through black-box testing, with all tested modules meeting the expected outcomes. Ordering, payment processing, and report generation run smoothly, supporting both accuracy and speed in transaction handling. The application’s usability allows it to be operated by non-technical users, ensuring practical adoption in daily operations.

Furthermore, the digitalization process has improved business oversight by enabling real-time data access and automatic transaction recording. This helps the kiosk owner in decision-making and planning, based on structured and reliable sales data. In conclusion, the Laravel-based system contributes significantly to the modernization of small-scale food business operations, aligning them with current technological standards and opening the door to future digital development.

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